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PROJECT INSHORE

Project Inshore

Stage 1

December 2012

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Stage 1

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Glossary

ASCOBANS	Agreement on the Conservation of Small Cetaceans of the Baltic, North East Atlantic, Irish and North Seas
BDC	Biodiversity data centre
CFP	Common Fisheries Policy
CITES	Convention on Trade in Endangered Species of Wild Flora and Fauna
Defra	Department for Environment, Food and Rural Affairs
EC	European Commission
EEZ	Exclusive Economic Zone
ETP	Endangered, Threatened and Protected Species
EU	European Union
EUNIS	European Nature Information System
ICES	International Council for the Exploration of the Sea
IFCA	Inshore Fisheries and Conservation Authorities
IUCN	International Union for Conservation of Nature
JNCC	Joint Nature Conservation Committee
OSPAR	Oslo and Paris Conventions
MCZ	Marine Conservation Zone
MMO	Marine Management Organisation
MPA	Marine Protected Area
MSC	Marine Stewardship Council
Nm	Nautical mile
PI	Performance Indicator
PSA	Productivity Susceptibility Analysis
RBF	Risk based Framework
SAC	Special Areas of Conservation
SICA	Scale Intensity Consequence Analysis

SNCBs	Statutory Nature Conservation Bodies
SPA	Special Protection Areas
TAC	Total Allowable Catch
UoC	Unit of Certification
VMS	Vessel Monitoring System

1 Introduction

Project Inshore is an ambitious new initiative led by Seafish, Marine Stewardship Council (MSC) and Shellfish Association of Great Britain which was officially launched on 8th June 2012 coinciding with World Oceans Day. The UK Fisheries Minister, Richard Benyon noted at the time that Project Inshore "…should help to ensure that our inshore fleet can continue to flourish, that fish stocks are managed sustainably and our marine environment is given the protection it needs". This project will carry out MSC pre-assessments for an extensive range of fisheries around the English coast. The results of these assessments will form the basis for Strategic Sustainability Reviews for English Inshore fisheries to provide a road map to guide future management decisions.

The funding for the project comes from a diverse range of sources notably the European Fisheries Fund (EFF), the Sustainable Fisheries Fund and industry (Seafish, UK retailers and processors). Other partners in the project include the Marine Stewardship Council, Shellfish Association of Great Britain (SAGB) and Seaweb's Seafood Choices.

The Sussex Inshore Fisheries and Conservation Authority (IFCA) (previously the Sussex Sea Fisheries Committee) piloted a multi species fishery methodology in 2010 with its 'Navigating the Future' Inshore Fisheries Sustainability Pilot (Dapling *et al*., 2010). Navigating the Future utilised the MSC pre-assessment criteria to evaluate the performance of 26 local inshore fisheries. Project Inshore proposes to carry this model forward on a nationwide scale for key commercial fisheries operating within the remaining IFCA districts.

Food Certification International Ltd (FCI) is the company selected and appointed to undertake Project Inshore. FCI ltd have assembled a team to undertake the project which includes experts from a number of different companies from UK and Ireland including the Hambrey Consulting, Marine Institute (Ireland), PAH Medley, MERC Environmental ltd, Nautilus Consultants, Poseidon Aquatic Resource Management and TD Southall.

1.1 Approach to Project Inshore

Project Inshore consists of three stages which progress from a broad overview of English inshore fisheries to strategic targeted action as follows:

Stage 1: Macro analysis and profiling of English inshore fisheries including:

- Data collection/ information gathering phase.
- Broad scale analysis of English fisheries.
- Development of list of fisheries (species/gear combination) to progress to Stage 2 pre-assessment.

Stage 2: Pre-assessment of English fisheries based on an aggregated/matrix approach for assessing each selected fishery (species / gear combination) in relation to the Marine Stewardship Council (MSC) standard. The key output of Stage 2 will provide a preliminary determination of how closely each performance indicator of each fishery meets the MSC standard.

Stage 3: Development of bespoke Strategic Sustainability Reviews for each English Inshore Fisheries and Conservation Authority (IFCA). These assessments will facilitate English inshore fisheries moving towards a level judged sustainable by the MSC standard.

This report forms the output of Stage 1 which focuses on English inshore fisheries. However, due regard is given to those species where stock boundaries are likely to extend out with inshore areas.

The focus of this project, as the name suggests is on English Inshore Fisheries, but how exactly this is defined (both 'inshore' and 'fishery') is less clear, with a range of different interpretations. In simple terms English inshore fisheries are those within 6nm of the coast, under IFCA management jurisdiction and fished by vessels eligible to fish within the IFCA district (Figure 1.1). But from a biological and management perspective (and indeed from an MSC Unit of Certification perspective) the scale of the stock plays a key role in determining the extent of the fishery, so catches beyond 6nm are equally important. Similarly, those vessels which typically fish in the English 0-6 nautical mile zone also often fish beyond the 0-6 nautical mile zone, even targeting the same resource. In practice therefore the definition of inshore may vary from stock to stock and district to district. Although the focus of the study is on management at IFCA level and landings from coastal waters, this is always set in the wider context of landings beyond 6nm.

1.2 Data Sources

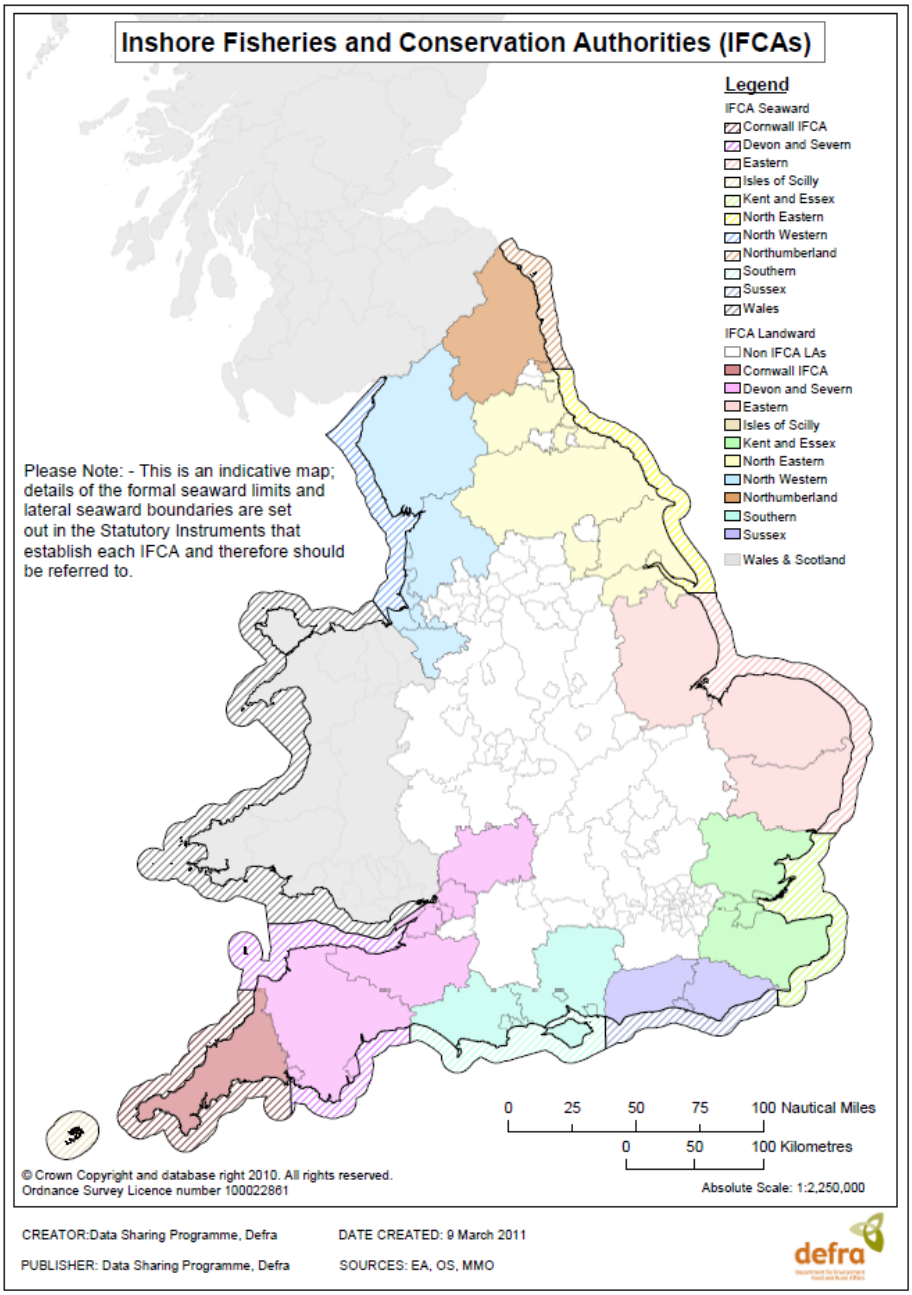
Early in the Stage 1 process a Data Strategy was developed to outline the data and information sources that would be collated to inform this report and Stage 2 assessment. The Data Strategy also highlights uncertainties surrounding a number of the datasets. The Data Strategy is provided in Appendix A and covers the following key data sources:

- Landings statistics recorded by ICES statistical rectangle (for rectangles that overlap IFCA areas);
- Vessel Monitoring System data;
- Surveillance data;
- UK Fishing Vessel List;
- Stock assessments;
- Habitat mapping; and
- Scientific and grey literature.

A separate data request was submitted to each IFCA to source all locally specific data available including Shellfish Returns, fleet register details, local stock assessments, research plans etc. An example of the IFCA data request is provided in Appendix B.

In requesting this information from the IFCAs the study team deliberately flagged up an extensive range of possible data sources. Although it was not expected the IFCAs would have information in all areas it was felt important to highlight the types of information than can be useful to inform MSC interpretations, and give IFCAs the opportunity to share as wide a range of information as possible with the assessment team. In reviewing the data from the IFCAs the assessors are interested both in the content of the data – for determining status of different outcome indicators in the MSC assessment, but equally they are interested in understanding the types of information that is collected and how this is used to inform management decision making, thus enabling the assessors to score the MSC information indicators.

Figure 1.1: Location of English Inshore Fisheries and Conservation Authority (IFCA) districts (Defra, 2011)



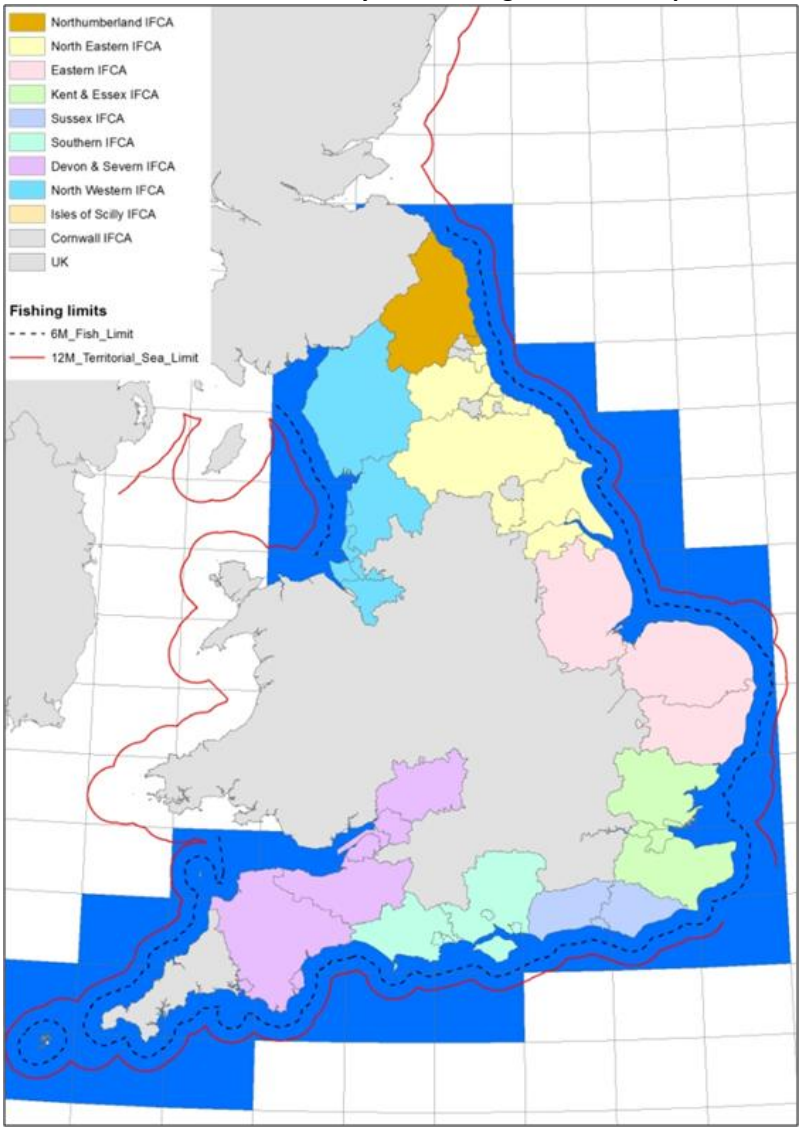
The most important sources of data for this Stage 1 report came from analysis of landing and vessel statistics obtained from the Marine Management Organisation (MMO) including the following:

- Landing statistics for weight and value of species landed from ICES statistical rectangles that overlap with IFCA districts for landings by UK registered vessels into English ports. In total data from 42 ICES statistical rectangles were collated for the area shown in Figure 1.2. A five year data set for 2006-2010 was collated; data for 2011 was not available for release from the MMO. Due to data confidentiality restrictions have been put in place by the MMO to ensure that data surmising statistics from less than five vessels is not released. For this reason a detailed data set could not be obtained. Instead, five separate excel datasets were provided with the following detail per column:
    - Species dataset: Year, ICES rectangle, species, weight, value;

- Vessel length dataset: Year, vessel length category (<10m, ≥10-15m, ≥15m), ICES rectangle, species, weight, value;
- Port of landing dataset: Year, port of landing, ICES rectangle, species, weight, value;
- Month dataset: Year, month, ICES rectangle, species, weight, value; and
- Gear type dataset: Year, gear type, ICES rectangle, species, weight, value.

- Vessel Monitoring System data amalgamated for mobile and passive gear on a grid system of 0.05 degree sub-rectangles indicating effort (number of pings), weight and value (based on cross reference with logbook data). VMS data is only available for vessels ≥15 m in length and therefore does not capture much of the inshore fleet activity. Active fishing is assumed to occur at fishing speed of 2-6 knots, regardless of gear type. A four year data set was provided from 2007-2010.
- Surveillance data provided as latitude and longitude coordinates indicating vessel activity as either fishing, steaming or laid stationary. Data covers air and at-sea patrols and was provided for a five year period 2007-2011. Surveillance data includes all vessel lengths and is recorded based on gear type, so provides a useful profile for inshore activity.

Figure 1.2: Data collated for inshore area defined by ICES rectangles that overlap IFCA districts



1.2.1 Data uncertainties and information constraints

It is part of the function of this project to highlight discrepancies or gaps in data. This stage 1 report is no exception. The report presents a summary of the main available information. Inaccuracies or gaps in national databases will therefore typically be reflected in this report. The report is not intended to be a definitive encyclopedia of English Inshore Fisheries. Instead the report is designed to give a relative understanding of English inshore fishery characteristics and provide a resource for the assessment team to inform the assessment process. Meetings with the IFCAs during stage 2 of the project deliberately focuses on any inaccuracies or gaps in the data as presented so that these can be addressed in the pre-assessment (stage 2) and subsequent strategic review (stage 3). Some of the key weaknesses in the data presented in this report are highlighted below:

Landings statistics

In terms of spatial scale landing statistics within the MMO database are reported based on ICES statistical rectangles. ICES rectangles consist of a grid of 0.5° latitude by 1° longitude (approx 1100 nm^2 at 52° latitude). The scale of ICES rectangles provides a very coarse resolution when compared to the spatial structure of most fishing activities and therefore should be considered as the appropriate spatial scale for providing a broad context rather than a detailed analysis. The ICES rectangles that overlap with IFCA districts cover a much larger area than the districts themselves, as can be seen in Figure 1.2, and often extend well beyond the 12 nautical mile limit, let alone the 6 nautical mile limit which defines the IFCA districts. Landings statistics will therefore include landings from non-inshore waters and indeed landings by vessels that may not be permitted to operate within IFCA districts, such as beam trawlers or vessels over 15m in length.

Furthermore, due to data confidentiality the MMO have suppressed any row entries that record data for less than 5 vessels. This has affected the level of detail for analysis, for example it is not possible to compare landings a certain gear, by vessels of certain lengths, as these attributes are provided in separate datasets that are not necessarily comparable. The suppression of data has led to the category 'species unknown', which includes data for all the suppressed entries. In this case it is not that the species is unidentifiable, just that is has been landed by less than five vessels and cannot be reported. This is seen throughout the dataset and in particular for species that consist of large one-off landings, such as pelagic species.

Landings data from Regulating Order and Several Order fisheries (and Hybrid Orders) are reported direct from the Grantee to DEFRA so do not appear in the MMO landing statisitcs when queried by inshore ICES reclangles. As a result landings of certain shellfish species – in particular cockle, mussel and oyster may appear less than is actually the case. However regional site visits during stage 2 of the project will seek to coorobate landings information at a more local level and capture the importance of these fisheries.

In addition there are some further gaps in the data which distort any effort to draw an accurate statistical picture of English Inshore Fisheries. For example any landings made by under 10m vessels to businesses which are not registered with buyers and sellers are unlikely to be accurately reflected. This may include some legal business which are not required to register – for example when processing and selling one's own catch (e.g. brown crab). Furthermore, landings of shellfish by hand gathering outside of a regulating order are not required to be recorded and such landings can be significant in both quantity and value.

Vessel monitoring system data

VMS does not usually provide direct information on the activity of the vessel; activity has to be deduced from the vessel's speed, assuming that between certain speed bands fishing is taking place and outside of these values the vessel is engaged in some other activity (e.g. steaming, at anchor). The MMO use a blanket assumption that active fishing occurs at fishing speeds of 2-6 knots. This

can significantly over and under represent effort depending on gear type, for example potters often haul pots at a speed of 0-2 knots.

VMS data provides data only for entire fleets that are using VMS. It does not provide information on the activities of smaller vessels. In coastal waters where fisheries legislation often excludes larger vessels, VMS data will provide information only on the activity of larger vessels that use VMS. It cannot be used to infer activity by smaller vessels as these are likely to target different species, deploy different gears and fish different grounds to larger vessels. In areas well offshore where it is unlikely that smaller vessels will be able to operate, VMS data may provide a complete picture of the activities of fishing vessels.

Surveillance data

A number of ICES rectangles did not return any surveillance data during reports run by the MMO. The MMO continue to investigate why this may have occurred, however a full dataset has not been made available at this stage. Areas where surveillance data has been unavailable are indicated appropriately on all maps.

There are limitations on the use of surveillance data including:

- The patrol effort by IFCAs, Royal Navy Fisheries Patrol Vessels and patrol aircraft are optimised for enforcement purposes and not collection of sightings data. Areas with fewer fisheries enforcement issues are therefore likely to be visited less often and result in lower data confidence.
- Surveillance data are only indicative of areas where fishing activities occur, as there is no continuous monitoring of activities.
- This is very much a snapshot of activity in the area. It cannot be assumed that as no vessels have been sighted fishing in an area that no fishing takes place there.
- Vessels fishing at night would likely remain undetected.
- The data assumes that all vessels in the sub-square are detected when a patrol ship or aircraft enters that sub-square. On days of poor visibility it is likely that even the air patrols will not be able to see all vessels in the area.
- The data may include multiple sightings of the same vessel as it crosses into another sub-square.
- There are relatively few data points, though a sufficiently long time series of observations should give an unbiased picture of the relative importance of different areas.

1.3 Report structure

The remainder of this report follows the structure outlined below:

Section 2 Marine Stewardship Council: providing an introduction to the MSC standard and assessment tree, together with details of how a Unit of Certification is defined. Details are also provided on English and UK fisheries that are already MSC certified, in the assessment process or have been withdrawn from the certification or process.

Section 3 English Inshore Fisheries Characteristics: providing details of fisheries landings on both a national English level and a local inshore level (defined by the ICES statistical rectangles that overlap the IFCA districts). Details of effort by gear type are provided based on VMS and surveillance data, as are details of fleet characteristics based on the UK Fishing Vessel List. Details of the species composition landed by different gear types are provided together with a description of these gears.

Section 4 English Marine Environment and Ecosystem: providing details of endangered, threatened and protected (ETP) species, habitats and nature designations including ongoing work for undertaking impact assessments in relation to fisheries operating within designated sites.

Section 5 Individual Inshore Fisheries and Conservation Authorities (IFCA) Reports: detailing data specific to each IFCA including a review of landings (based on ICES rectangles that overlap each IFCA district), high resolution VMS and surveillance data mapped for each IFCA and details of the information sources provided by each IFCA to inform Stage 2.

Section 6 Several Orders: providing an overview of the Several Orders and Regulating Orders in place within English inshore waters.

Section 7 Selection of Fisheries for Stage 2 Assessment: detailing criteria for selection of fisheries and reasons why certain species or gears have not been selected for further assessment at Stage 2.

Section 8 Individual Species Records: providing a two page summary for each species detailing whether ICES stock assessment shave been undertaken, whether the species is MSC certified (in UK or elsewhere), a biological description, species distribution maps, biological attributes and details of inshore landings including by IFCA district, by gear type and vessel length and 5 year trends in seasonality of landings.

2 Marine Stewardship Council

2.1 Introduction to the Marine Stewardship Council (MSC)

The MSC is dedicated to promoting "well-managed" and "sustainable" fisheries, and the MSC initiative focuses on identifying such fisheries through means of independent third-party assessments and certification. Once certified, fisheries are awarded the opportunity to utilise an MSC promoted eco-label and may gain economic advantages in the marketplace. Through certification and eco-labelling the MSC works to promote and encourage better management of world fisheries, many of which have been suggested to suffer from poor management.

There is no fixed prescription for meeting the MSC standard. It is up to the client to put together argument and evidence to demonstrate that stock condition, fisheries management and fisheries practices meet the appropriate standard. The essence of the standard is that the stock is harvested sustainably with low impact on the ecosystem, using a good management system that is likely to detect and respond to changing circumstances and problems as they occur. The client should achieve this through the presentation to the assessment team of objective and verifiable information, corroborated by independent means wherever possible.

The MSC certification process can be undertaken for any fishery with the exception of a fishery under controversial unilateral exemption to an international agreement or a fishery using poisons or explosives.

2.2 MSC Standard

The MSC standard is divided into three principles which cover the stock, the ecosystem and the management system. Details of the principles are provided in Appendix C, and their overall intent is summarised below:

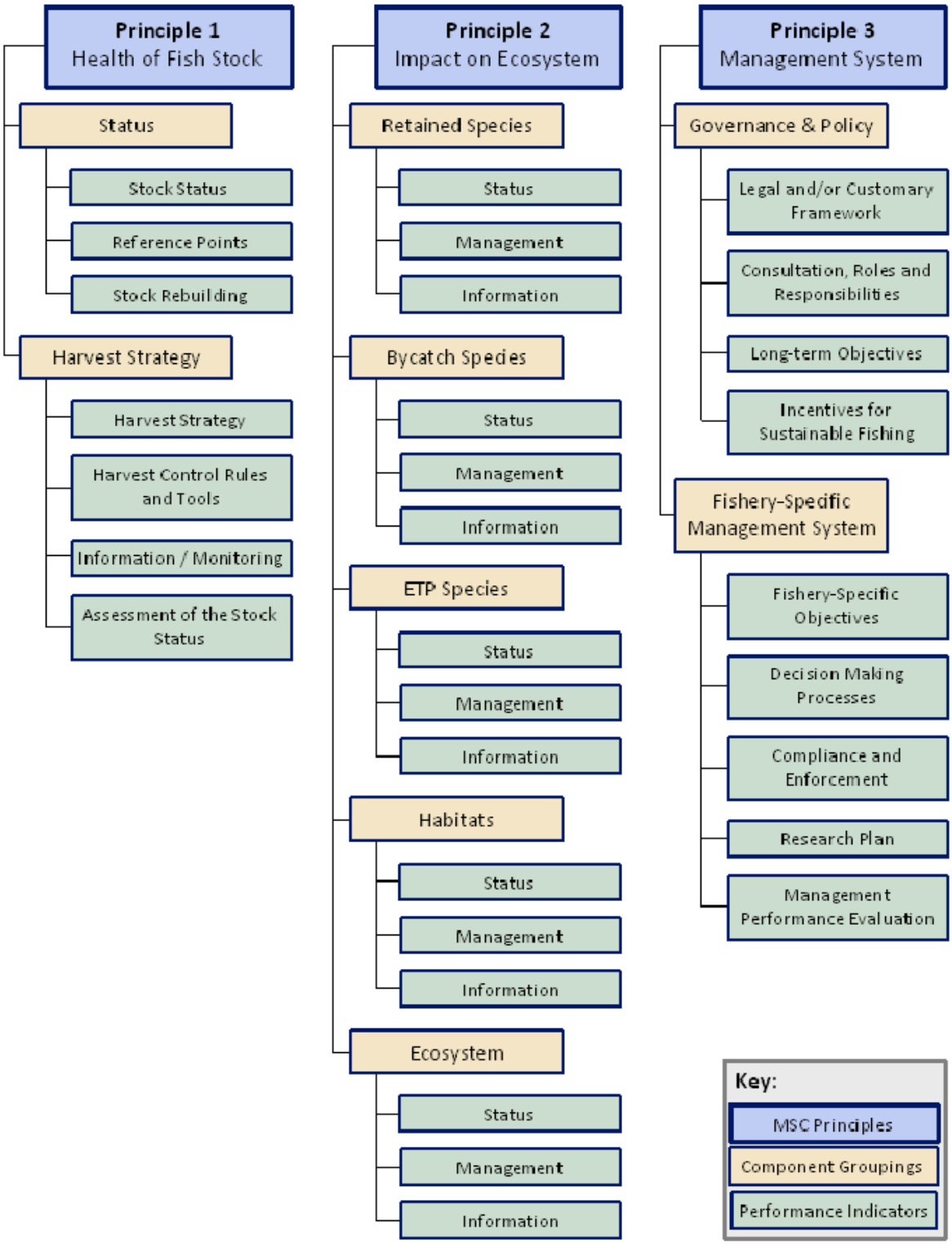
> Principle 1: A fishery must be conducted in a manner that does not lead to over-fishing or depletion of the exploited populations and, for those populations that are depleted, the fishery must be conducted in a manner that demonstrably leads to their recovery.
>
> Principle 2: Fishing operations should allow for the maintenance of the structure, productivity, function and diversity of the ecosystem (including habitat and associated dependent and ecologically related species) on which the fishery depends
>
> Principle 3: The fishery is subject to an effective management system that respects local, national and international laws and standards and incorporates institutional and operational frameworks that require use of the resource to be responsible and sustainable.

Under each principle are a series of components, and under each component are a series of Performance Indicators (PI). Within each PI a set of scoring issues are defined and the assessment team must decide and justify where scoring issues are met by the fishery under assessment.

The default assessment tree is presented in Figure 2.1 and outlines the components and PIs for each Principle. The scoring issues can be found in MSC certification requirements available for download from the MSC website at:

http://www.msc.org/documents/scheme-documents/msc-scheme-requirements

Figure 2.1: MSC Default Assessment Tree for Scoring Fisheries



2.3 Unit of Certification

The MSC Guidelines to Certifiers specify that the unit of certification is:

> "The fishery or fish stock (biologically distinct unit) combined with the fishing method / gear and practice (= vessel(s) pursuing the fish of that stock) and management framework".

In its most basic form the unit of certification can mean one vessel, one species, one gear, one location. In practise it is normally a group of vessels targeting one species with one gear type in one area, although synergies can often arise particularly between gear types and areas.

Each unit of certification will go through the MSC assessment process as one unit and therefore receive one score. This score will be based on the lowest common denominator, for example if two gear types are included in one unit of certification, the worst possible combination for any Performance Indicator is scored.

2.4 The MSC Risk based framework

MSC has sought to develop an alternative route to certification for small scale or data deficient fisheries. This requires a fishery to clearly demonstrate low risk (either low intensity on a large scale population or a highly productive population with low susceptibility to capture). Although this may be seen as an alternative route to certification, it must be clearly stated that this methodology is likely to be more precautionary, and therefore potentially harder to pass. Even in this alternative methodology it is important to demonstrate the linkages between monitoring / assessment and management response.

There are two main risk assessment tools which can be used: the first a low level precautionary analysis of the scale and intensity of the fishery and the likely consequence (SICA analysis); the second a slightly more in depth analysis of species productivity against susceptibility to capture (PSA analysis).

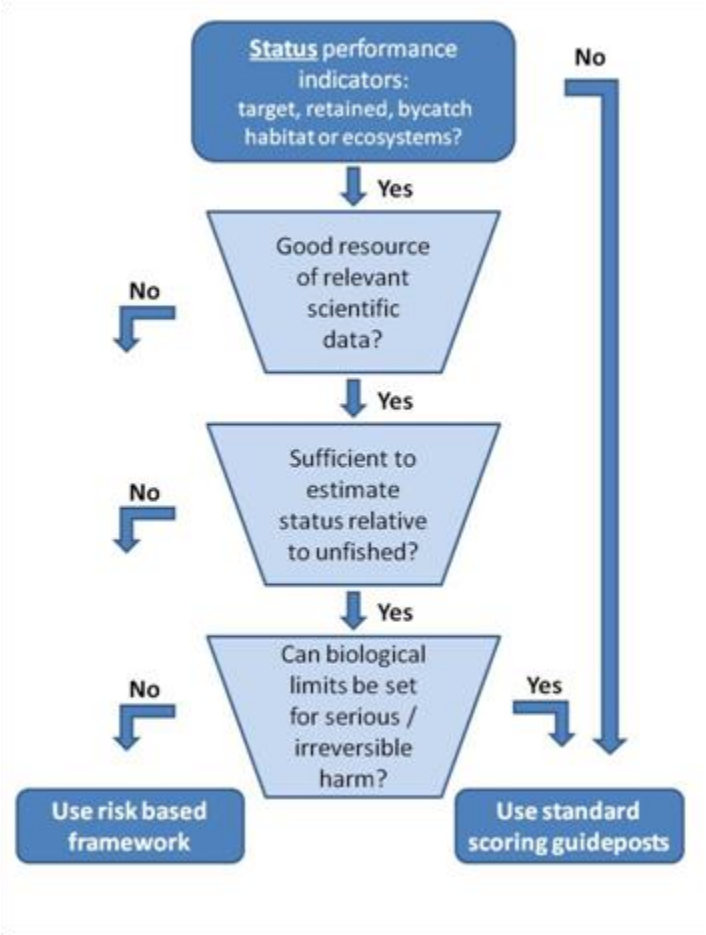
Given that in practice most SICA assessments are deliberately weighted to conclude high risk (given the low level of information), and indeed are not on their own sufficient for use to assess the target stock (Principle 1), the PSA analysis forms a more useful and insightful tool for use during pre-assessment.

The PSA analysis scores the species against key biological parameters to determine productivity (age at maturity, fecundity, tropic level, maximum size etc), and compares this against susceptibly of the species to be caught by a given gear (selectivity, spatial overlap etc). The biological parameters for each species are detailed within Section 8.

The scores from the risk based analysis are only a potential substitute for standard assessment scores in 3 out of 7 principle 1 performance indicators (relating to the status of the target stock – triggering automatic scores of 80 elsewhere in the P1 assessment), and 4 out of 15 performance indicators in relation to principle 2 (status of retained species, bycatch, habitats and ecosystem). All other performance indicators including all principle 3 areas, and all areas in relation to management and information, and ETP status (which it is not permissible to judge according to risk) must still be scored using the standard assessment. In other words, the requirements for good reactive management supported by good data are unchanged – even where risk assessment is used to determine status.

Figure 2.2 presents a simplified adaptation of the standard MSC flow chart which summarises how the choices are made about when it is appropriate to use the risk based framework. For a fuller description of the standard MSC assessment methodology, refer to Appendix C.

Figure 2.2: Simplified flow process for selecting the risk based methodology



2.5 English fisheries already MSC certified, or in the process of certification

A number of English and UK fisheries have obtained MSC certification, are in the process of assessment or have withdrawn from the certification; all these fisheries are summarised in Table 2.1 by country, species and gear.

Certified species include pelagic species (5 herring fisheries, 2 mackerel fisheries and a sardine fishery); demersal finfish (2 sole fisheries, haddock and saithe); and shellfish (3 mussel fisheries, 2 cockle fisheries, nephrops, queen scallop, scallop, brown crab and velvet crab).

Species currently in the assessment process include some of these certified species, as well as bass and 6 ray species in the Bristol Channel. Native oysters are also currently in assessment, as is a mixed beam trawl fishery in the English Channel (for megrim, monkfish and sole).

Three English and two Scottish fisheries have withdrawn from the process, although the reasons for withdrawal are unknown they could be commercially linked or due to the fisheries no longer meeting the MSC standard.

Table 2.1: UK fisheries MSC certified, in assessment, not certified or withdrawn from the certification process (as reported on MSC website 26 September 2012)

Status	Country	Species	Fishing method	Location	Fishery assessment downloads
Certified	England	Mussels	Hydraulic jet elevator	NW English Channel	Exmouth mussels
	England	Sardine	Ring net and drift net	VIIe and VIIf	Cornwall sardine, UK
	England	Sole	Demersal otter trawl (80mm) and gill net (90mm)	VIId	Hastings fleet Dover sole trawl and gill-net
	England	Sole	Trammel net	VIId	Hastings fleet Dover sole (trammel net)
	England/Wales	Cockles	Hand-gathered	Dee Estuary, VIIa	Dee Estuary cockle
	Isle of Man	Queen scallops	Demersal otter trawl	VIIa	Isle of Man queen scallop trawl
	Scotland	Brown crab, velvet crab and scallops	Creel and scallop dredge	IVa within 6 nautical miles	SSMO Shetland inshore brown & velvet crab and scallop fishery
	Scotland	Haddock	Demersal otter trawl and demersal seine (120mm)	IVa,b	Scottish Fisheries Sustainable Accreditation Group (SFSAG) North Sea haddock
	Scotland	Herring	Pelagic otter trawl	IV and VIId	Scottish Pelagic Sustainability Group Ltd (SPSG) North Sea herring
	Scotland	Herring	Pelagic otter trawl	I, IIa & IIb, V & XIV	Scottish Pelagic Sustainability Group Ltd Atlanto Scandian herring
	Scotland	Herring	Pelagic otter trawl	VIa North, VIb, Vb	SPSG West of Scotland herring Pelagic Trawl
	Scotland	Mackerel	Pelagic otter trawl	VI, VII, and IVa	Scottish Pelagic Sustainability Group Ltd western component of north east Atlantic mackerel
	Scotland	Mussels	Rope grown	IVa, VIa	Shetland and Scottish Mainland Rope Grown mussel Enhanced fishery
	Scotland	nephrops	Demersal otter trawl	VIa	Stornoway nephrops trawl
	UK	Arctic cod, haddock and saithe	Demersal otter trawl	I and II	UK Fisheries/DFFU/Doggerbank Northeast Arctic cod, haddock and saithe
	UK	Herring	Pelagic otter trawl	Iia and Iib	Pelagic Freezer-Trawler Association Atlanto-Scandian herring pelagic trawl
	UK	Herring	Pelagic otter trawl	IV and VIId	Pelagic Freezer-Trawler Association North Sea herring
	UK	Mackerel	Pelagic otter trawl	IIa, IVa, Vb, VI, VII, VIIIa, VIIIb, XII and XIV	Pelagic Freezer-Trawler Association North East Atlantic mackerel pelagic trawl
	UK	Saithe	Demersal otter trawl	IV, VI and Iia	UK Fisheries/DFFU/Doggerbank Group saithe
	Wales	Cockles	Hand raking and sieving	Burry Inlet	Burry Inlet cockles
	Wales	Mussels	Dredge	VIIa	North Menai Strait mussel

Status	Country	Species	Fishing method	Location	Fishery assessment downloads
In assessment	England	Bass	Demersal otter trawl	VIIf	Bristol Channel sea bass
	England	Hake	Gill net	VIIe,VIIf, VIIg, VIIh, VIIj, VIIk	Cornish hake gill net
	England	Herring and mackerel	Drift net (Certified in Sep 2005 and expired in Nov 2011)	VIId	Hastings fleet pelagic herring and mackerel
	England	Lobster	Creel	Ivb	North East England lobster pot
	England	Megrim, monkfish and sole	Beam trawl	VII d,e,f,g and h-k and VIIIa	C&WSTG English Channel megrim, monk and sole beam trawl
	England	Native oyster	Dredge and hand collection	Blackwater River	Blackwater native oyster
	England	Thornback, blonde, small eyed, sandy, spotted and cuckoo rays	Demersal otter trawl	VIIf	Bristol Channel ray
	Northern Ireland	Mussels	Dredge	Irish Sea	Northern Ireland Bottom Grown Mussel (Mytilus edulis) Fishery
	Scotland	nephrops	Creel	VIa	Clyde nephrops creel
	Scotland	nephrops	Demersal otter trawl	VIa	Clyde nephrops trawl
	Scotland	Saithe	Demersal otter trawl and Scottish seine	IVa and VIa	Scottish Fisheries Sustainable Accreditation Group (SFSAG) saithe
	UK	nephrops	Demersal otter trawl	Ivb,c	Southern North Sea nephrops
Not certified	England	Lobster	Creel	Yorkshire coast out to 6 nautical miles	North Eastern Sea Fisheries Committee lobster, UK
Withdrawn	England	Bass	Gill net	Holderness Coast	North Eastern Inshore Fisheries and Conservation Authority sea bass
	England	Herring	Drift net	Thames/Blackwater/Colne Estuary	Thames Blackwater herring drift-net
	England	Mackerel	Handline	VIIe, f, g and h	South-West handline mackerel
	Scotland	nephrops	Creel	Thames/Blackwater/Colne Estuary	Loch Torridon nephrops creel fishery
	Scotland	nephrops	Demersal otter trawl	IVa,b	Scottish Fisheries Sustainable Accreditation Group (SFSAG) North Sea nephrops

3 English Inshore Fisheries Characteristics

This section provides an overview of landings statistics, effort and fleet characteristics for all English fisheries at national and inshore levels.

3.1 Fisheries landings

3.1.1 Landings by species

National overview

English landing statistics are published annually by MMO and available for download from their website: http://www.marinemanagement.org.uk/fisheries/statistics/annual.htm

Data for 2011 were recently published at a national level, however data by ICES rectangle (as discussed in the section below – Inshore Overview) were not available for 2010. Therefore, in order to present an accurate year on year comparison, the landings information for 2010 has been used for analysis.

Total live weight and value of landings by UK vessels into English ports from 2006-2010 are presented in Figure 3.1. Total landings have remained relatively consistent across this five year period with a slight peak in 2007. Total value in 2010 was just under £140 million, equating to 90,000 tonnes live weight for all species.

In 2010 scallops represent the most commercially important species by far, with a total value of £27.5 million landed into English ports by UK vessels (Figure 3.2). Sole is the second most important species with a value of £13.8 million, followed by crabs (£13.3 million), lobster (£12 million), monkfish (£8.3 million), cuttlefish (£7.5 million) and whelks (£5.8 million).

Other demersal finfish species of significant importance include lemon sole, bass, cod, turbot, plaice and ray species (most likely thornback ray). Other shellfish species of significant importance include nephrops and shrimp.

Inshore overview

Total live weight and value of landings by UK vessels into English ports from ICES rectangles that overlap IFCA districts are presented in Figure 3.3 (together with a map indicating the area represented by these ICES rectangles). Landings were consistent from 2006-2008, but an increase of 53% by value and 35% in weight is seen from 2008 to 2009 and a further 13% in value and 14% in weight from 2009 to 2010. Total value landed by UK vessels into English ports from inshore ICES rectangles in 2010 reached £97.2 million, equating to 59,400 tonnes live weight for all species. Comparing average values across a five year period with 2010 values indicates that increases in sole, lobster, crab, scallops, cuttlefish and whelks are largely responsible for the higher values seen in 2009 and 2010.

In 2010 sole and lobster represent the most commercial important species to the English inshore areas, each worth £11.7 million (Figure 3.4). Brown crab are also highly important at a value of £9.3 million, followed by scallops (£9.3 million), cuttlefish (£5.5 million), whelks (£5 million) and monkfish (£4.6 million). As with national landings, other important demersal finfish species include lemon sole, bass, cod, turbot and plaice, and other shellfish species of significant importance include nephrops and shrimp.

Figure 3.1: Total live weight and value of landings by UK vessels into English ports, 2006-2010 (MMO, 2012)

Figure 3.2 Landings value by species for UK vessels landings into English ports (MMO, 2012)

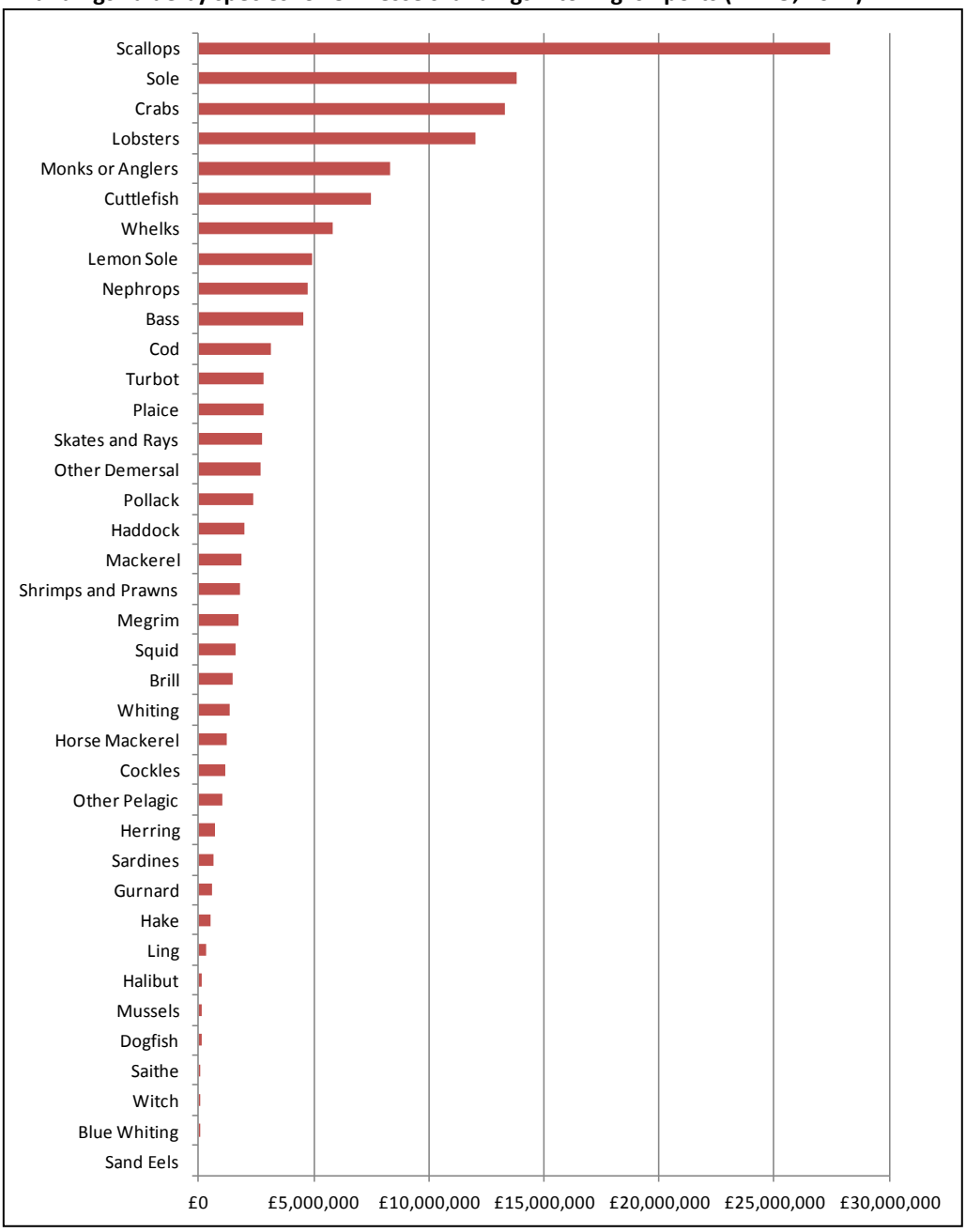
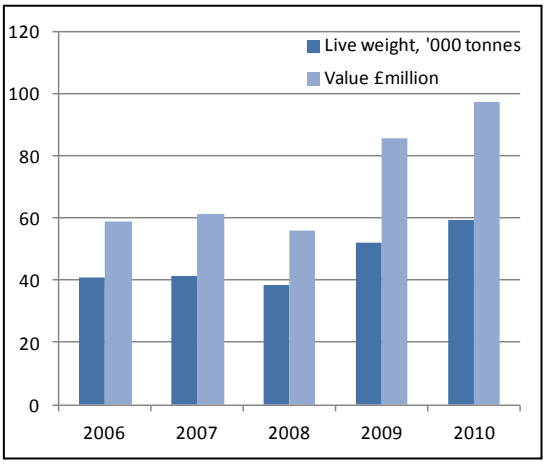


Figure 3.3 Total live weight and value of landings by UK vessels into English ports, 2006-2010, from inshore ICES rectangles i.e. those overlapping IFCA districts, as indicated in the map to the right (MMO, 2012)



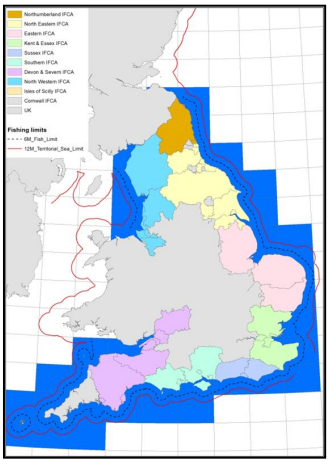
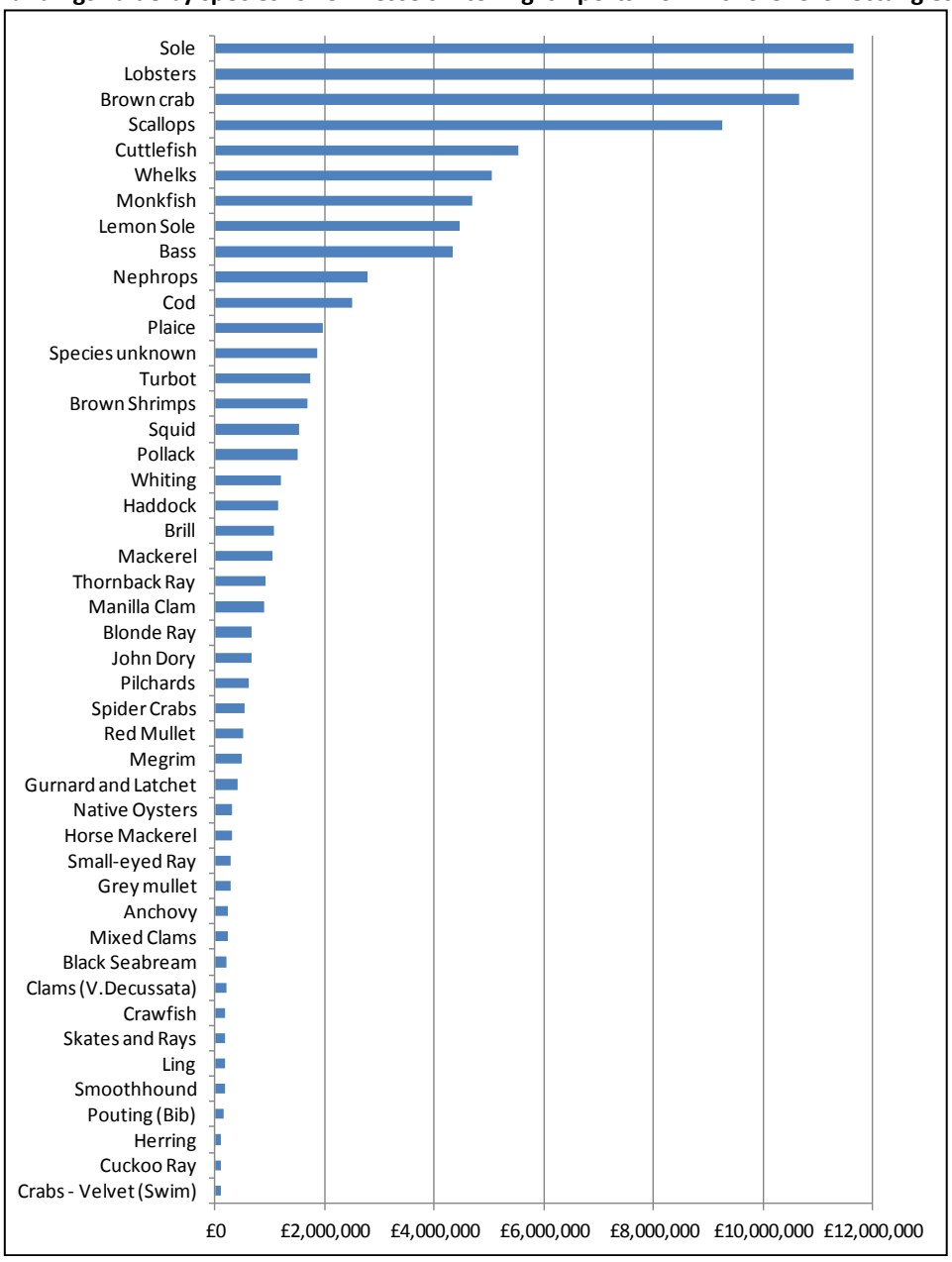


Figure 3.4: Landings value by species for UK vessels into English ports from inshore ICES rectangles (MMO, 2012)



Comparison of UK landings into English and non-English ports

Total UK landings into all UK ports are presented for 2010 in Figure 3.5 to compare landings into English ports with landings into non-English ports.

Approximately half of lobster and 'other shellfish' (including manila clam and native oyster) and ~40% of scallops and crabs are landed into English ports. While a much higher proportion of nephrops (94%), squid (94%), shrimp (76%) and mussels (74%) are landed into non-English ports.

Almost all (99%) of cuttlefish landings are into English ports and much higher proportions of whelk (62%) and cockles (73%) are also landed into England compared to other UK ports.

The overwhelming majority (>80% by weight) of demersal finfish landings for the following species are landed into non-English ports: haddock, cod, plaice, saithe, monkfish, whiting, hake, megrim, ling, sandeel, witch and halibut. Key demersal finfish species landed into England include bass (87% of total UK landings are landed into England), sole, lemon sole, brill and turbot, as well as rays, Pollack and gurnard.

Similarly for pelagic finish species the overwhelming majority are landed into non-English ports (91-100% for mackerel, herring, sardines and blue whiting). A quarter of horse mackerel landings and just over half of 'other pelagic' (including anchovy and sprat) are landed into England.

Comparison of national and inshore landings into English ports

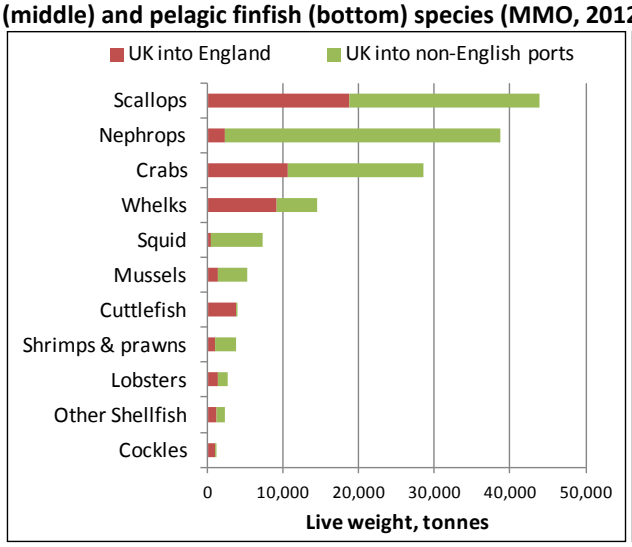
Landings into English ports by UK vessels in 2010 are presented in Figure 3.6 to compare landings from inshore ICES rectangles (that overlap with IFCA districts as shown in map in Figure 3.4) with landings into English ports originating from outside these inshore ICES rectangles. This allows a broad comparison of inshore versus offshore landings, although it is noted that portions of some of the inshore ICES rectangles fall outside 12 nautical miles and therefore this comparison should be treated as general rather than definitive.

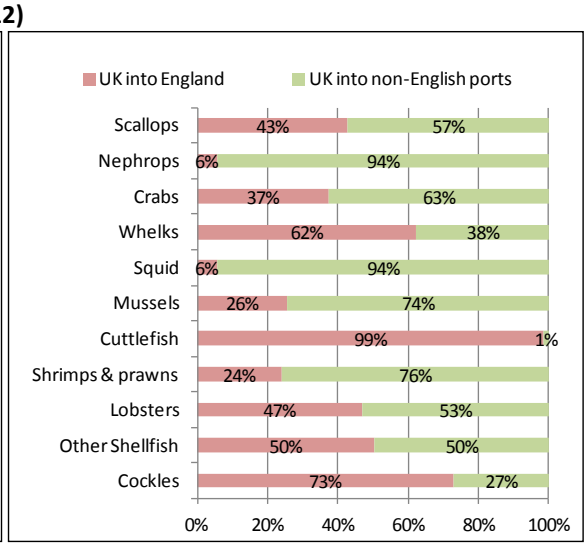
For the majority of shellfish species (crabs, whelks, cuttlefish, lobster, shrimp and squid) just under half (42-49%) are landed from inshore ICES rectangles. Exceptions exist for scallops and nephrops where the majority are taken outside inshore ICES rectangles; 75% of scallops and 63% of nephrops are landed from offshore locations. Figures for cockles and mussels are misleading as much of the inshore data has not been captured within the landings data, largely due to the nature of collection (hand gathered cockles are reported within Shellfish Returns collated by IFCAs, rather than the buyers and sellers register recorded by MMO). At this stage data from Shellfish Returns are still being collated and are not represented within these datasets, hence mussels and cockles appear to be landed for offshore locations, which is unlikely especially for cockles.

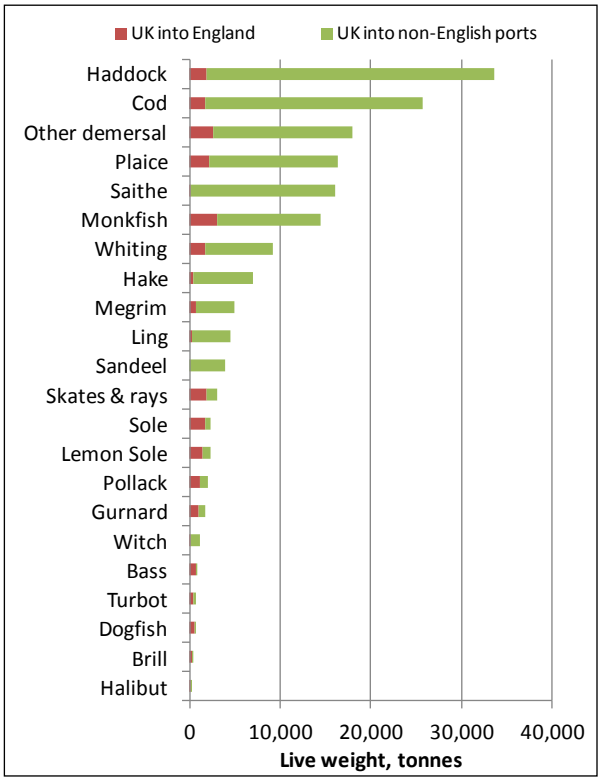
Relatively high levels of demersal finish species landed into English ports from inshore locations compared to offshore. This is particularly true for bass (94% from inshore), as well as whiting, lemon sole, sole, dogfish and rays (89-82% from inshore), and to a lesser extent pollack, gurnard, plaice, haddock, brill, turbot, ling and halibut (56-75% from inshore). By contrast it is notable that the majority of hake, saithe, witch and megrim are landed from offshore locations, with only 12-34% taken from inshore ICES rectangle areas.

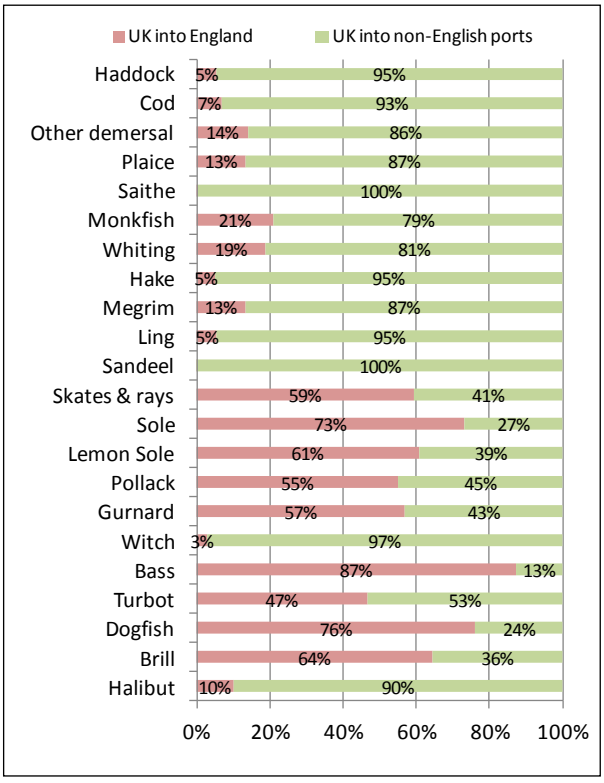
Unsurprisingly the majority of all pelagic finish species are landed from offshore locations, with the exception of sardine where 50% are taken from inshore ICES rectangle areas.

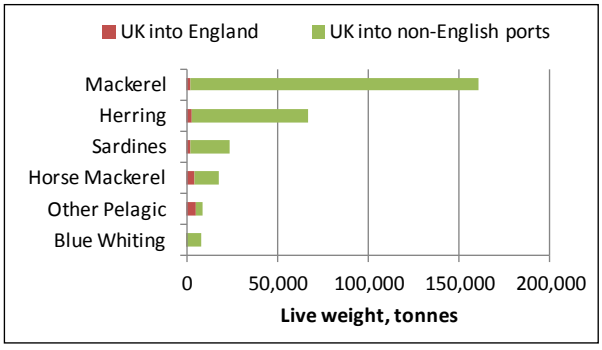
Figure 3.5: Live weight of landings into UK ports by UK vessels in 2010 distinguishing between landings into English (red) and landings into other UK (non-English) ports (green), for shellfish (top), demersal finfish (middle) and pelagic finfish (bottom) species (MMO, 2012)











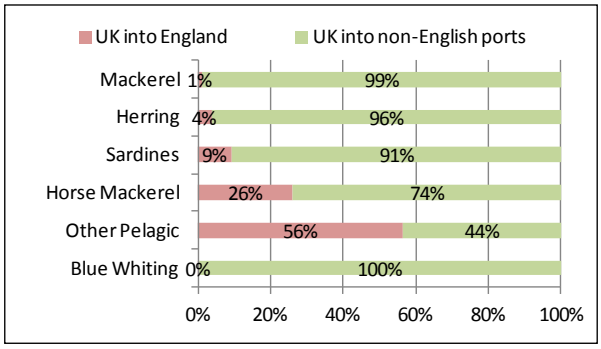
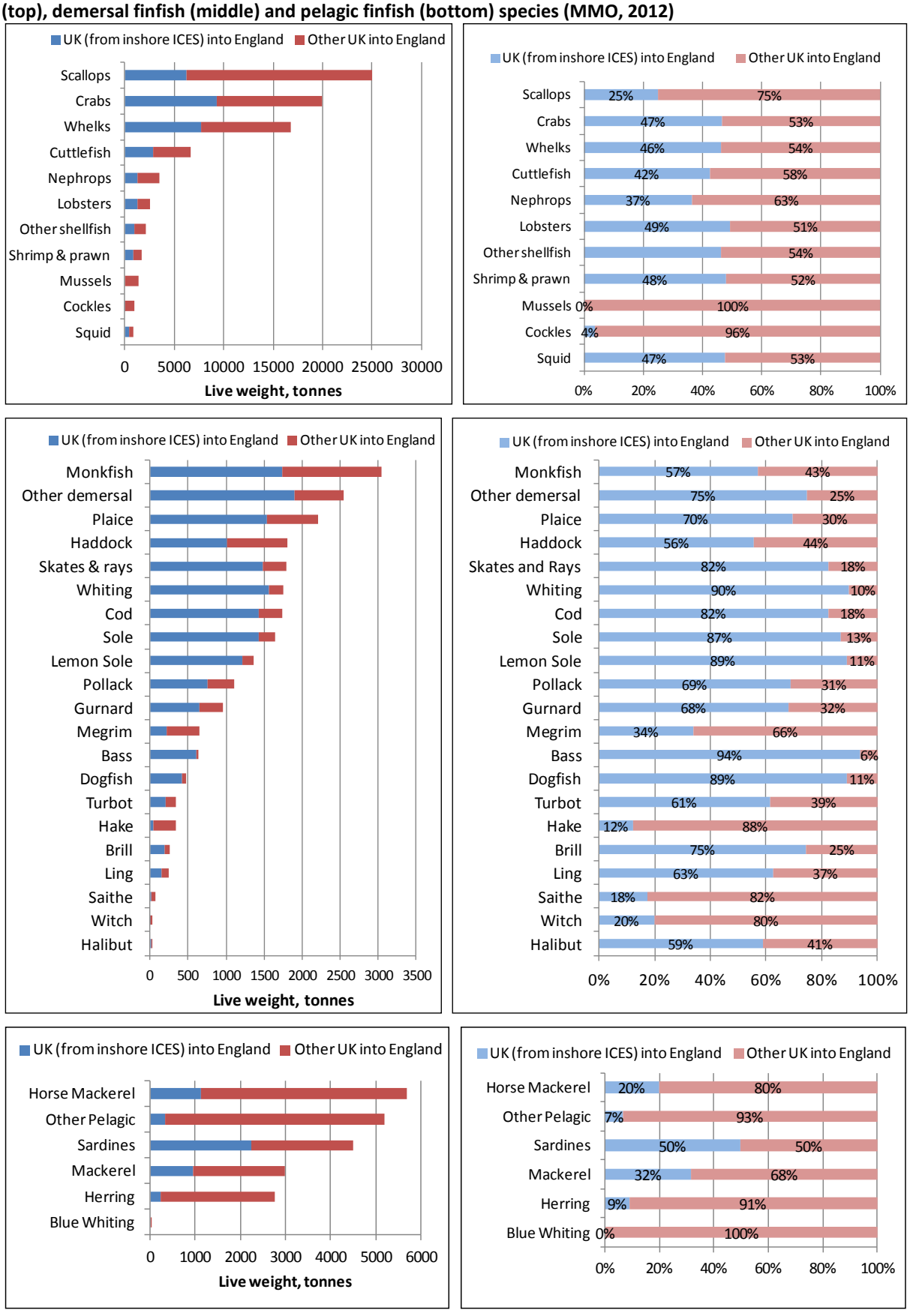


Figure 3.6: Live weight of landings into English ports by UK vessels in 2010 distinguishing between landings form inshore ICES rectangles (blue) and other landings out with these ICES rectangles (red), for shellfish (top), demersal finfish (middle) and pelagic finfish (bottom) species (MMO, 2012)



3.1.2 Landings by gear type

Landings by UK vessels into English ports from the inshore ICES rectangles that overlap IFCA districts are presented by gear type (based on proportion of value) in Figure 3.7.

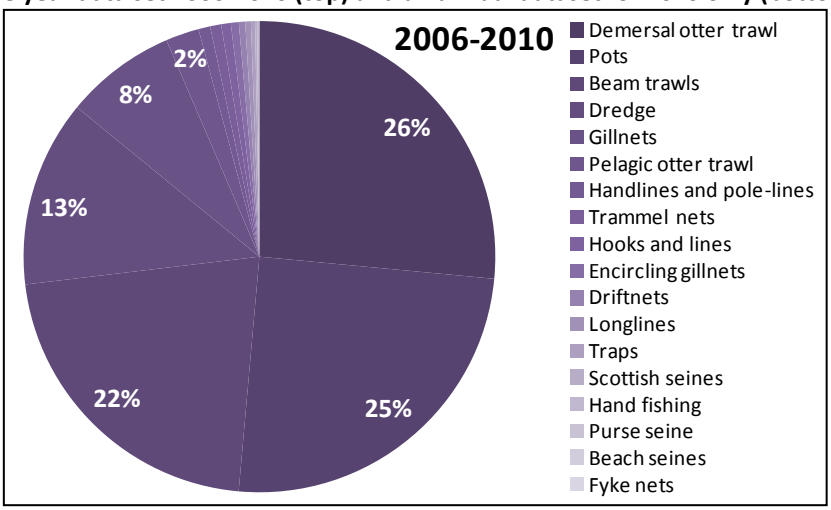
Across a five year time period (2006-2010) the highest proportion of landings value have been by demersal otter trawl (26%), pots (25%), beam trawl (22%), dredge (13%) and gill nets (8%).

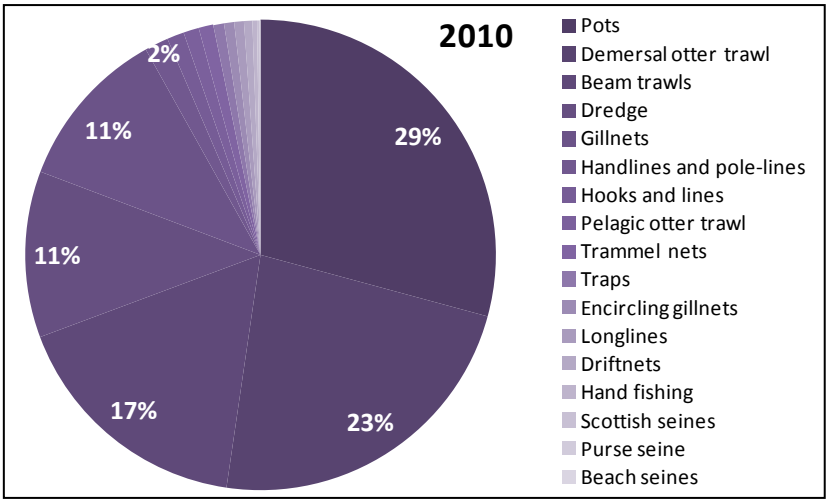
In 2010 a higher proportion of landings value was from pots (29%) and a lower proportion by beam trawl (17%) compared to the five year average.

In 2010 the value of landings by pots was £28.2 million, for demersal otter trawl £22.3 million (of which £3.1 million were nephrops), beam trawl £16.4 million, dredge £11 million and gill nets £9 million.

The combination of species landed by each gear type is presented in Sections 3.4 and 3.5 and summarised on an IFCA basis in Section 4 and a species by species basis in Section 8.

Figure 3.7: Proportion of landings value by UK vessels into English ports from inshore ICES rectangles by gear type based on five year data set 2006-2010 (top) and an annual dataset for 2010 only (bottom) (MMO, 2012)





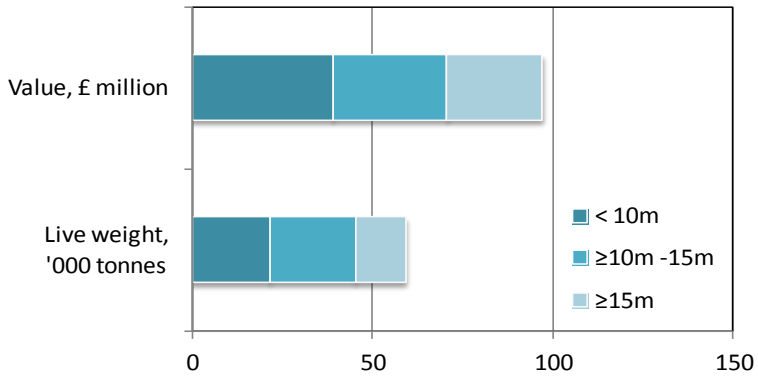
3.1.3 Landings by vessel length category

Landings in 2010 are presented for vessels under 10 m, 10-15 m and over 15 m in length in Figure 3.8. Under 10 m vessels landed 40% of the total value landed by UK vessels into English ports from the inshore ICES rectangles, which correlated to 37% of the landings by weight.

Vessels 10-15 m in length landed 33% of the value, but 40% of the live weight, suggesting they target to some extent lower value species than the under 10 m vessels. Over 15 m vessels were responsible for landing 27% of the value and 24% of the weight from this inshore area in 2010.

The proportion of landings by vessel length categories on a species by species basis are presented in Section 8.

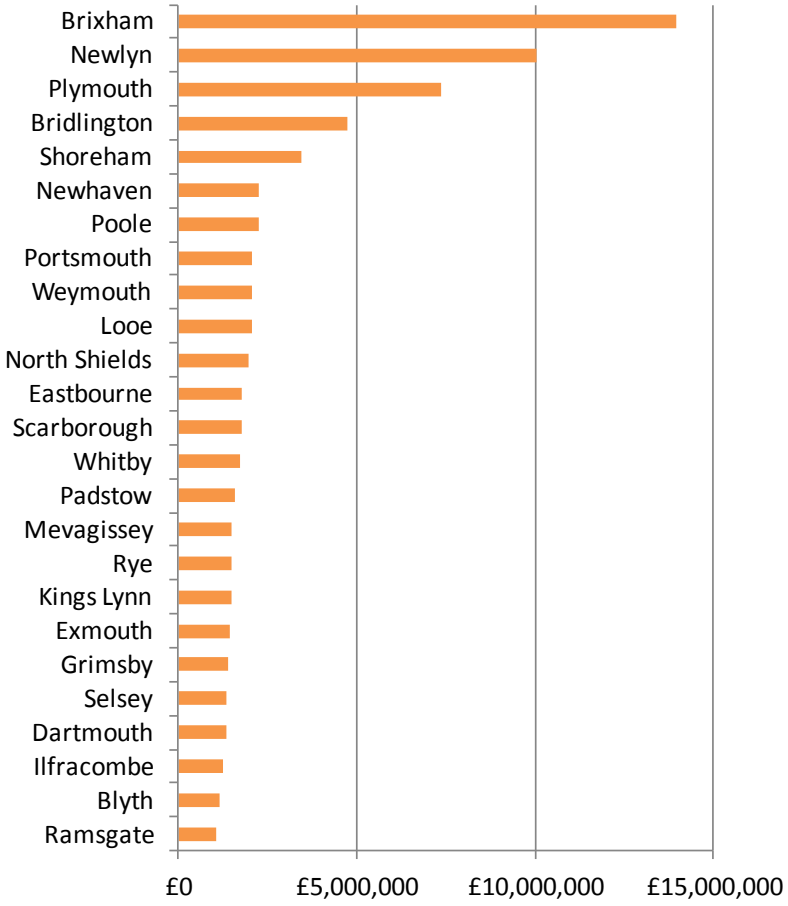
Figure 3.8: Value and live weight of landings by UK vessels into English ports from inshore ICES rectangles by vessel length category, 2010 (MMO, 2012)



3.1.4 Landings by port

In 2010 landings by UK vessels from inshore ICES rectangles were recorded into 158 English ports. The values landed into the top 25 ports are presented in Figure 3.9.

Figure 3.9: Value landed into top 25 English ports by UK vessels from inshore ICES rectangles, 2010 (MMO, 2012)



In 2010 landings into Brixham totalled just under £14 million with key species including scallops, cuttlefish, sole, monkfish and lemon sole. Landings into Newlyn totalled £10 million with key species including monkfish, brown crab, sole and scallops; Bridlington £7.3 million, made up of 60% lobster and 40% brown crab; and Portsmouth £4.7 million with key species including manila clam, whelks, bass, native oysters and cuttlefish.

Further details on key ports for landings on a species basis are presented in Section 8.

3.2 Effort

Vessel monitoring system (VMS) data for mobile and passive gears are presented in Figures 3.10 and 3.11 respectively. These data are amalgamated for all mobile (otter trawl, beam trawl, dredge etc) and all passive (pots, gill nets etc) gear types and represent effort based on number of pings for vessels ≥15 m in length.

Some effort by mobile and passive vessels ≥15 m is seen within 6 nautical miles adjacent to the North Eastern IFCA and the Eastern IFCA within the Wash. Otherwise, as expected, the majority of effort by the over 15 m fleet occurs outside the 6 nautical mile limit and therefore outside the IFCA districts.

Figures 3.12 to 3.18 present surveillance data by gear type based on air and at-sea patrols undertaken from 2007-2011. Demersal trawling is seen to oocur throughout most of the inshore areas (i.e. out to 6 nautical miles), with the exception of the north and central portions of the Eastern IFCA, the central section of the Southern IFCA and the south of the North Western IFCA.

Beam trawling predominately occurs in the south, within the English Channel and within the following IFCA districts: Cornwall, Devon and Severn, Southern, Sussex and Kent and Essex. Similalry dredging is also focused within the English Channel, notably in south area of Cornwall IFCA, the west of the Southern IFCA, the central area of Sussex IFCA and the south-west of Kent and Essex IFCA.

Very little pelagic trawl or purse seine is represented within the surveillance data collated for these inshore ICES rectangles.

Gill netting is recorded throughout Sussex and Cornwall IFCAs and in the west area of the Southern IFCA. Both gill nets and drift nets are recorded throughout the Northumberland IFCA.

Potting occurs throughour all inshore areas, with the exception of the south portion of the North Western IFCA where it is notabably absent.

Rod and line effort is dotted throughout many inshore locations, particulalry Cornwall, Sussex, Northumberland and North Western IFCAs. Prominent patches of longlining are recorded off the south portion of the Eastern IFCA and the west area of Sussex IFCA.

Figure 3.10: VMS effort for all UK mobile vessels ≥15m, 2010 (MMO, 2012)

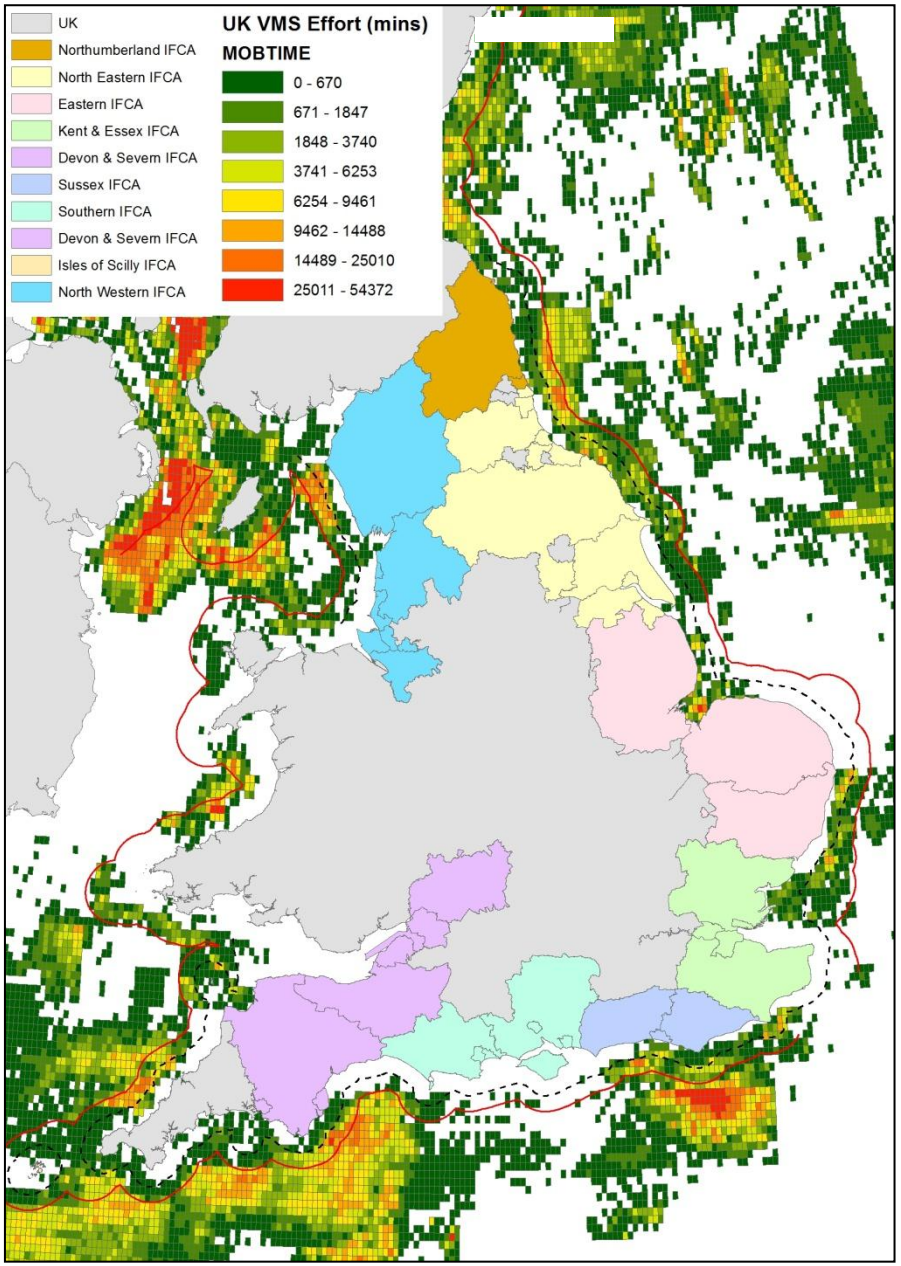
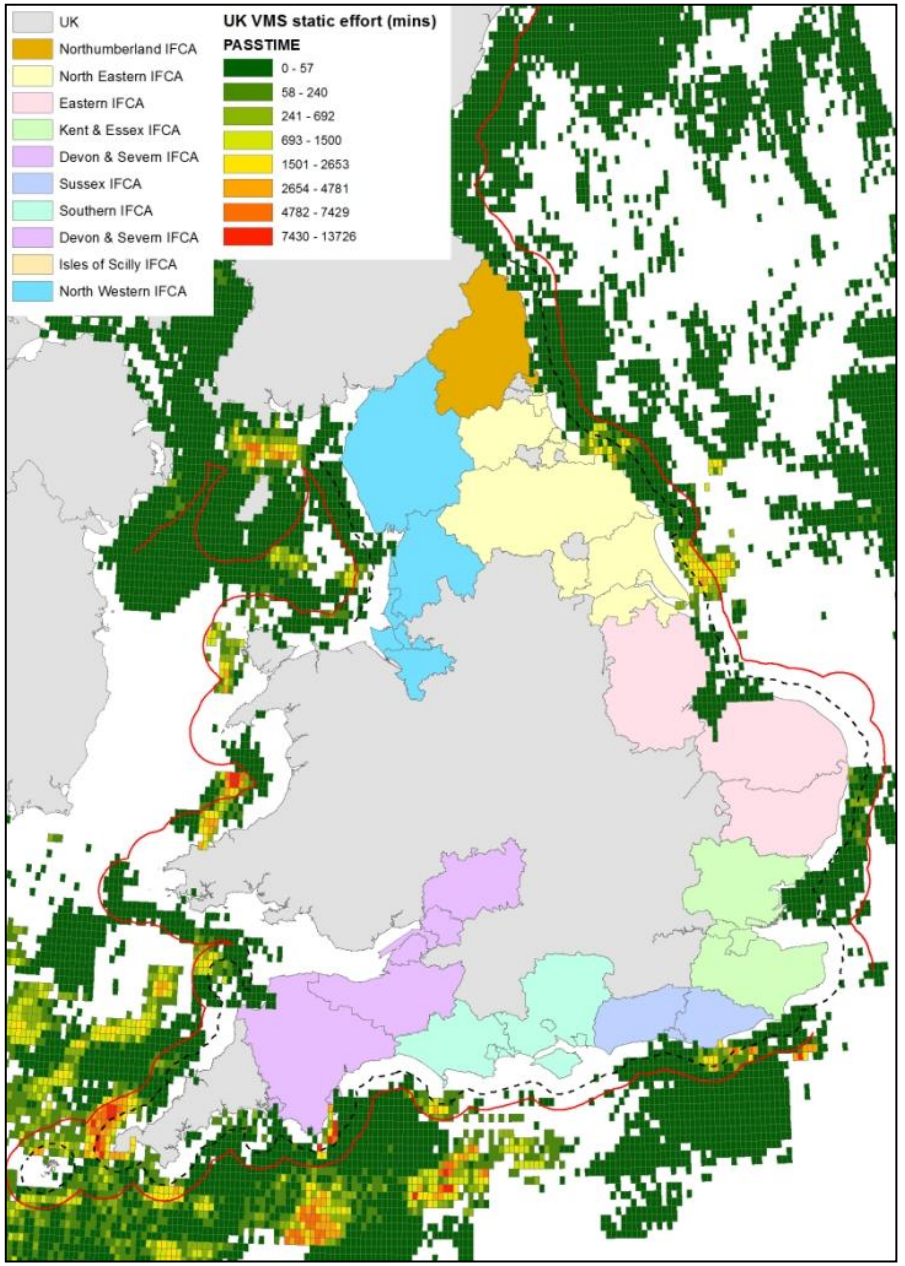


Figure 3.11: VMS effort for all UK static gear vessels ≥15m, 2010 (MMO, 2012)



The following series of figures present surveillance data amalgamated across a five year period (2007-2011) for the following gear types:

- Demersal trawl including demersal otter trawl, demersal seine and shrimp trawl;
- Beam trawl;
- Dredge including scallop dredge, suction dredge and dredge (other);
- Pelagic gear including pelagic (also known as mid-water) trawl and purse seine;
- Nets including gill nets and drift nets;
- Pots; and
- Lines including longline, rod & line and handline.

The surveillance data has been sourced from the MMO for ICES rectangles that overlap with the IFCA districts, which extend out to 6 nautical miles. Patrols by air and at-sea vessels are included. Only data for UK registered vessels are presented. Data are not sorted by speed, but represent actively fishing vessels as logged during surveillance patrols.

Data for five ICES statistical rectangles are missing (29E6, 30E6, 36F0, 37E6 and 37E7). The MMO are currently investigating the lack of data retrieved by the report run on their database as part of this data request. It is anticipated that figures will be updated when these data become available. Grey lines boxes indicate where data are unavailable.

Figure 3.12: Surveillance data for demersal trawl, 2007-2011 (MMO, 2012)

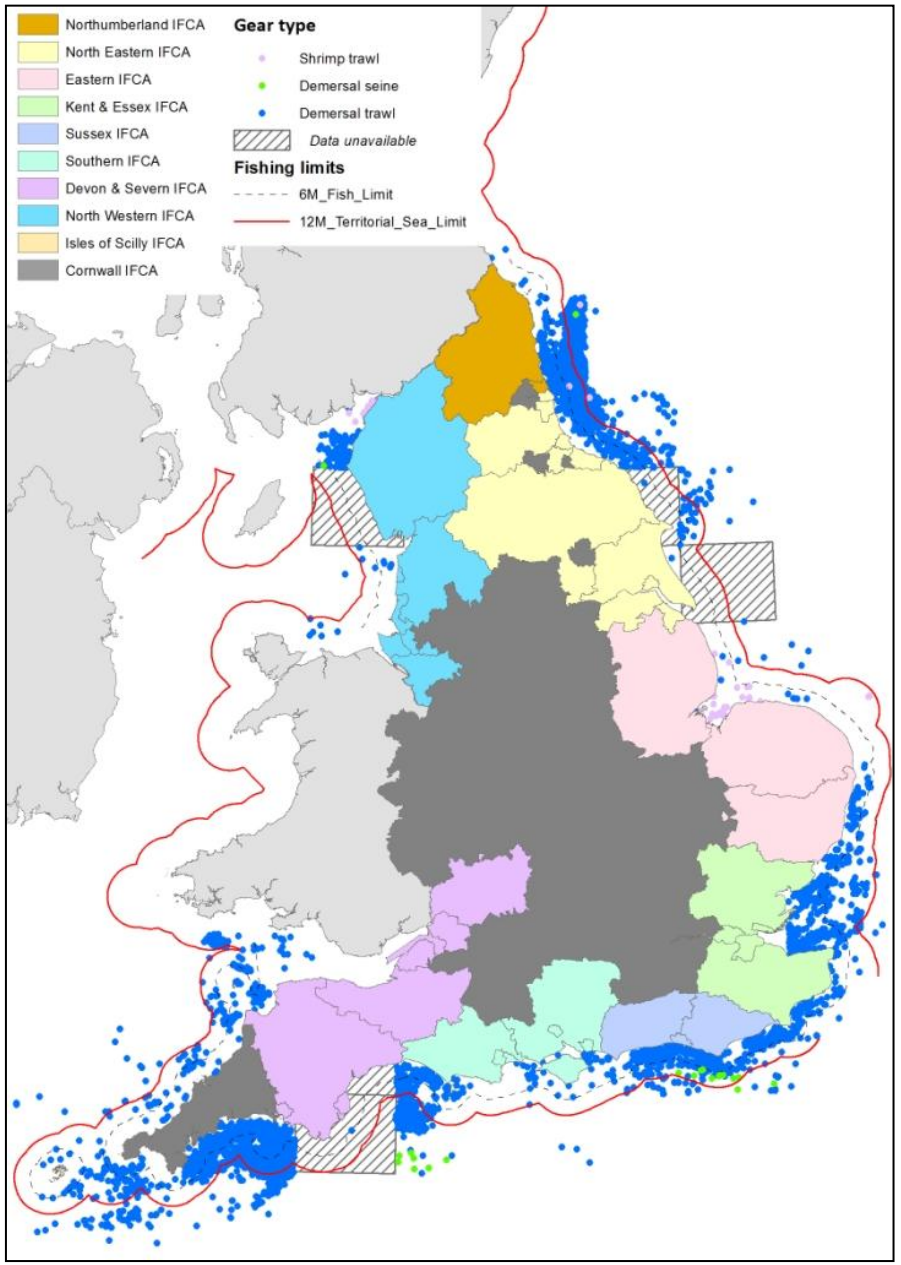


Figure 3.13: Surveillance data for beam trawl, 2007-2011 (MMO, 2012)

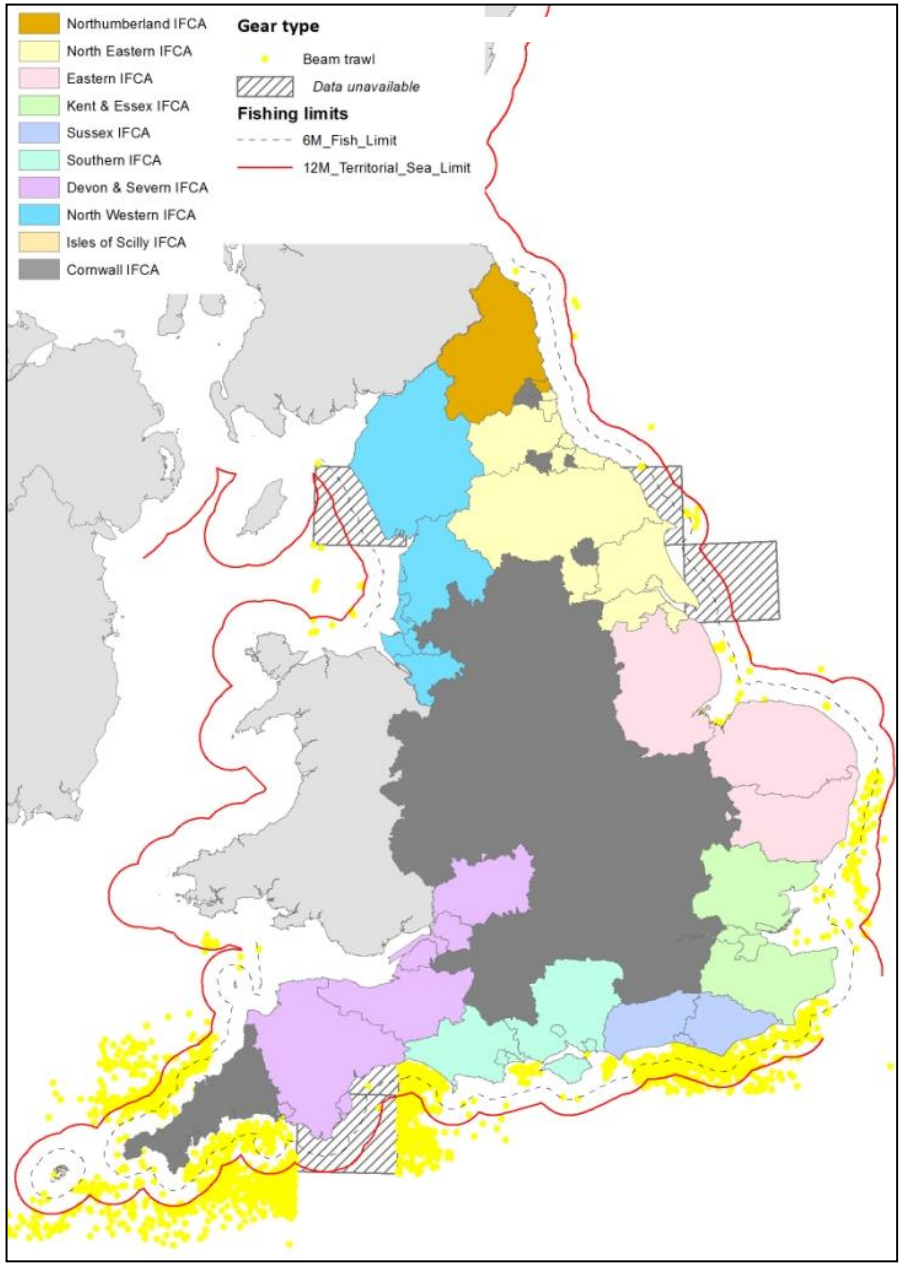


Figure 3.14: Surveillance data for dredge, 2007-2011 (MMO, 2012)

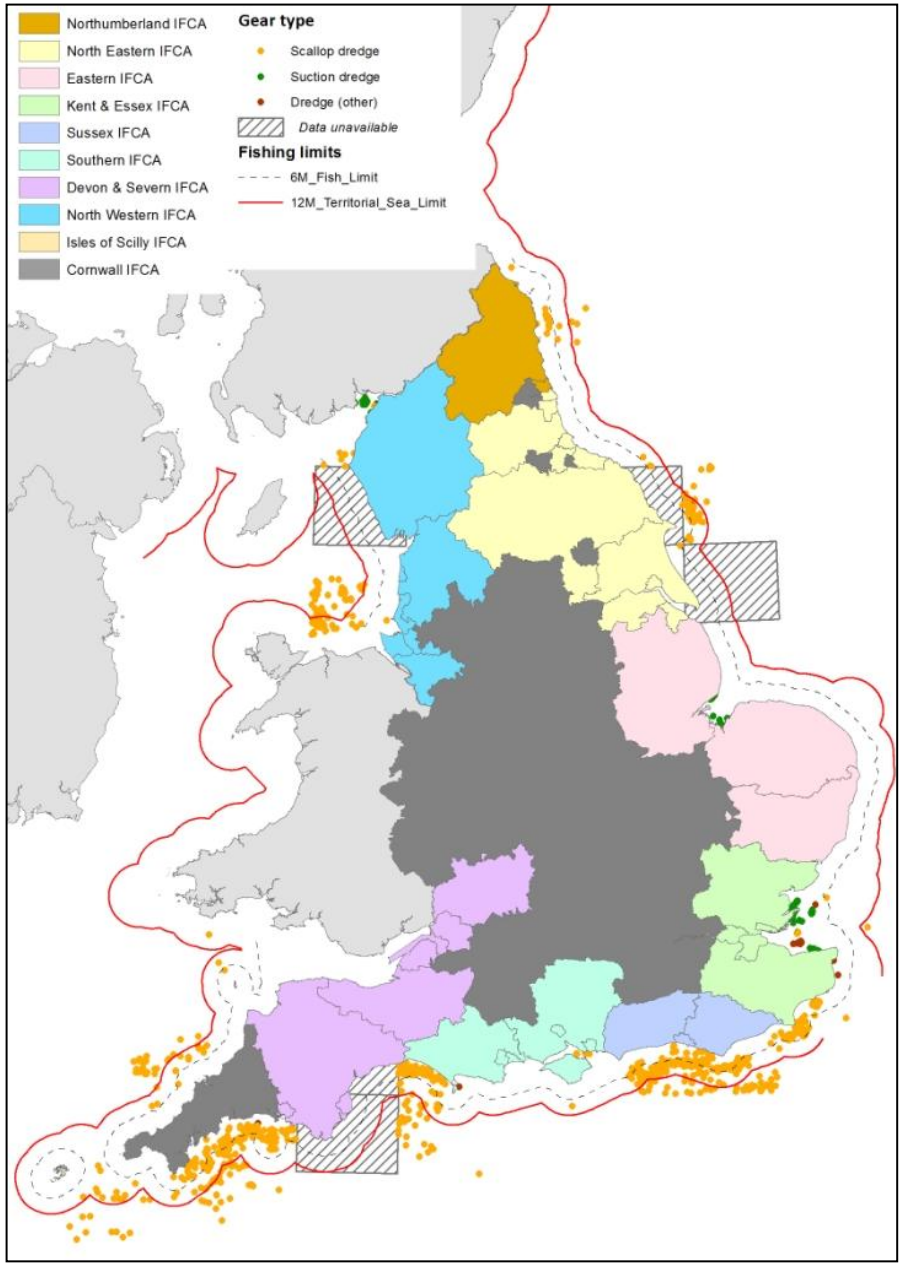


Figure 3.15: Surveillance data for pelagic trawl, 2007-2011 (MMO, 2012)

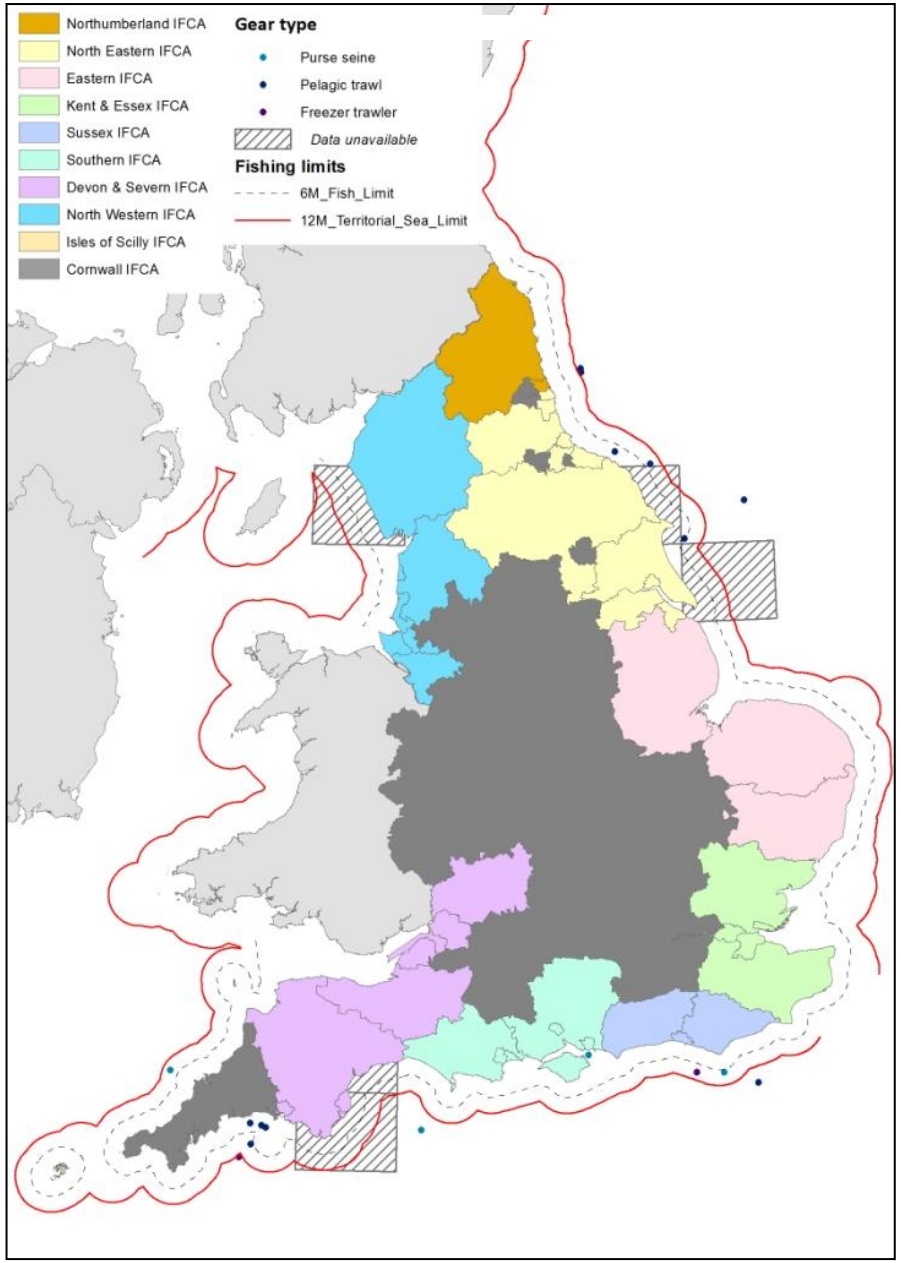


Figure 3.16: Surveillance data for set and drift nets, 2007-2011 (MMO, 2012)

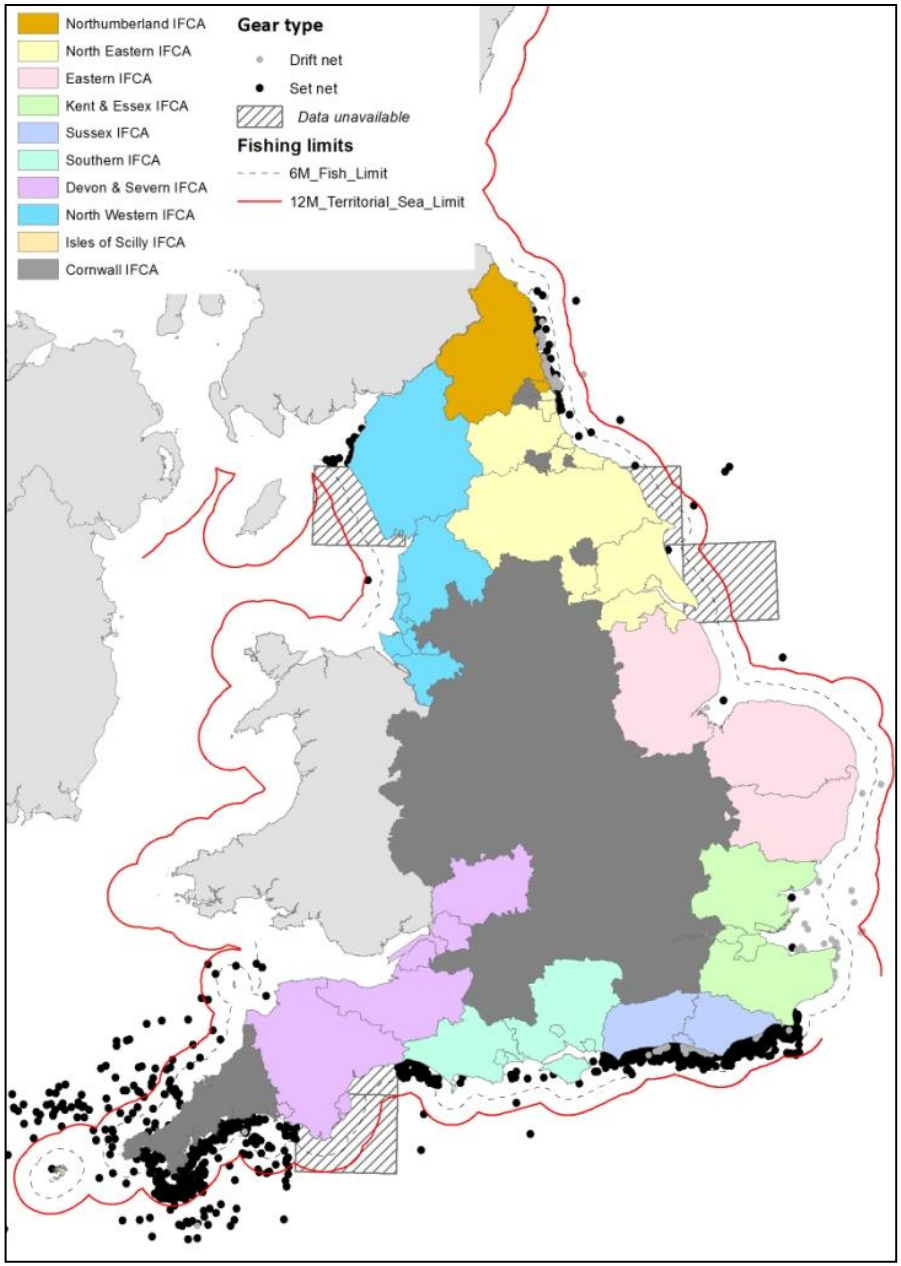


Figure 3.17: Surveillance data for pots, 2007-2011 (MMO, 2012)

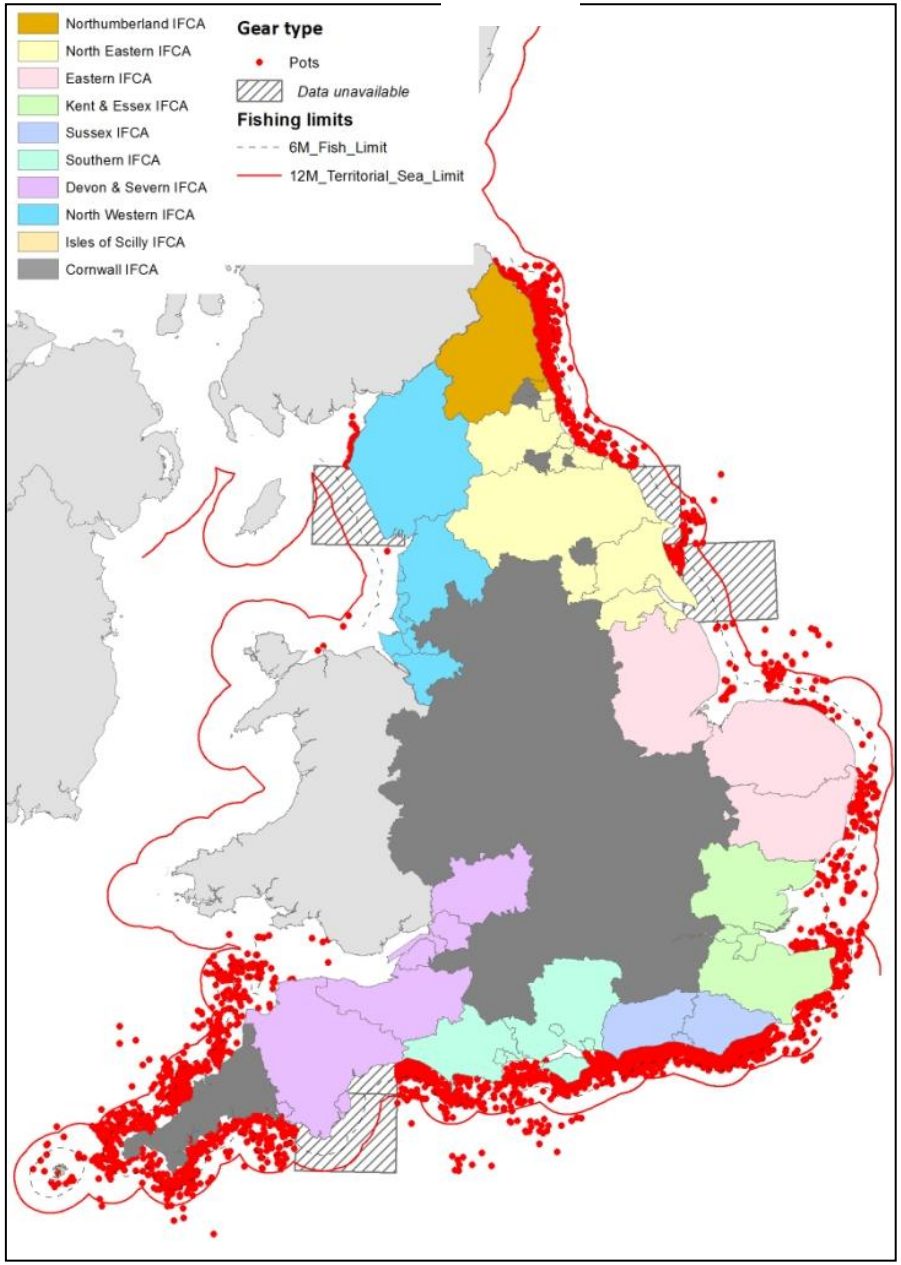
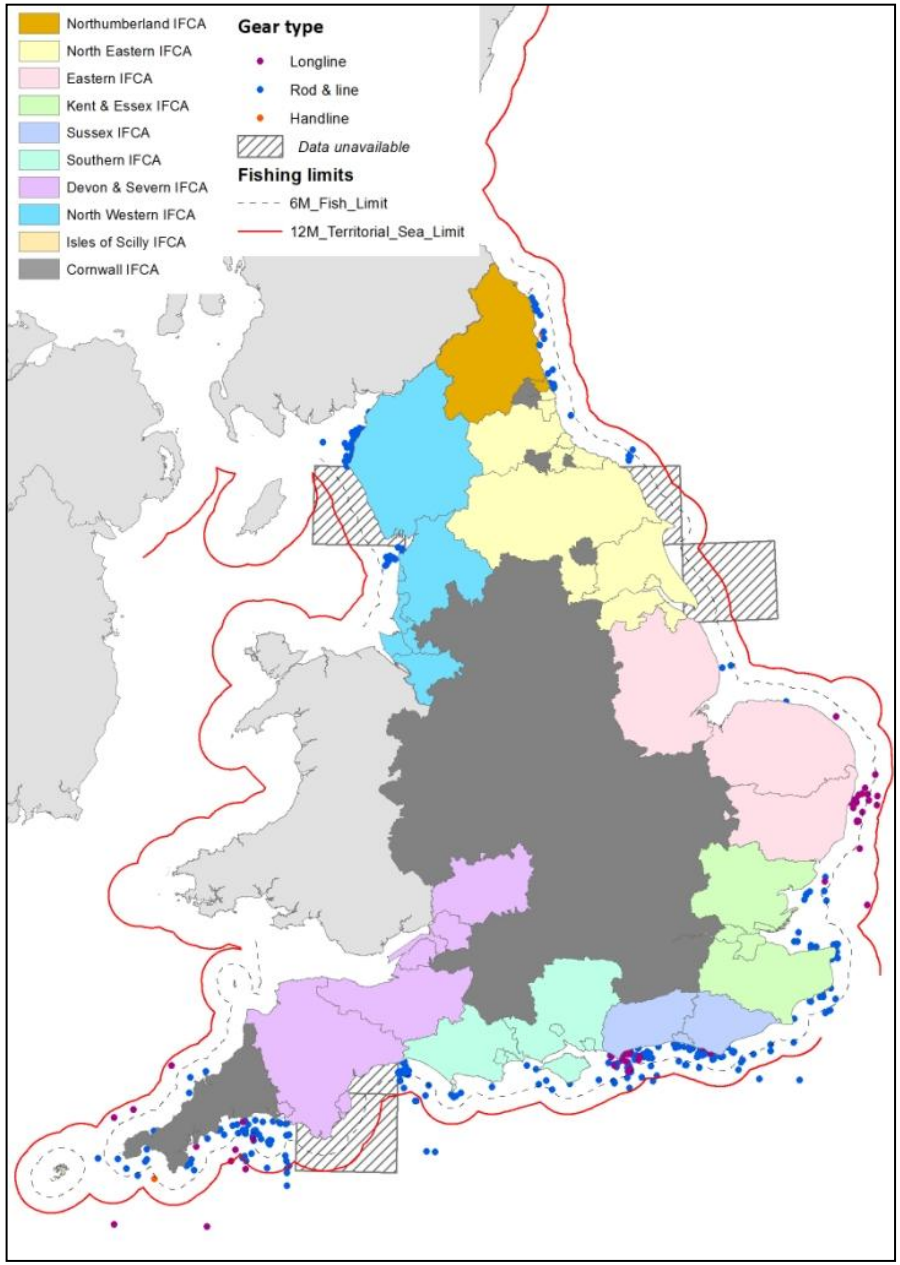


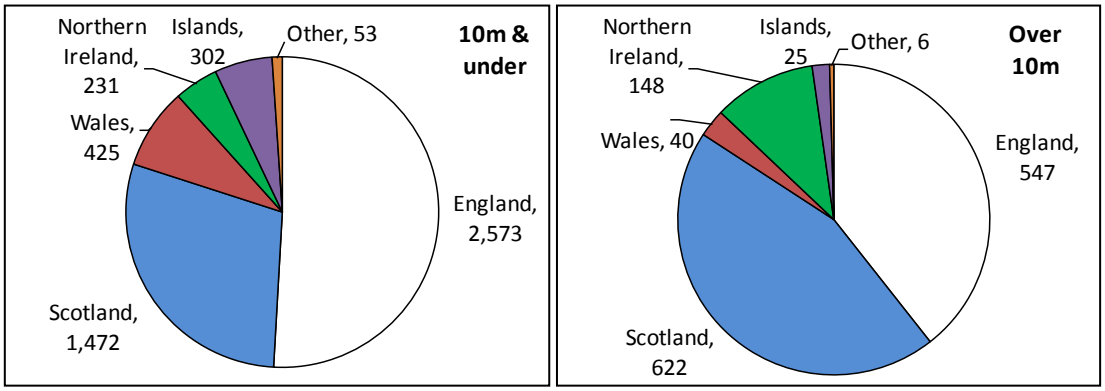
Figure 3.18: Surveillance data for lines, 2007-2011 (MMO, 2012)



3.3 Fleet characterisitcs

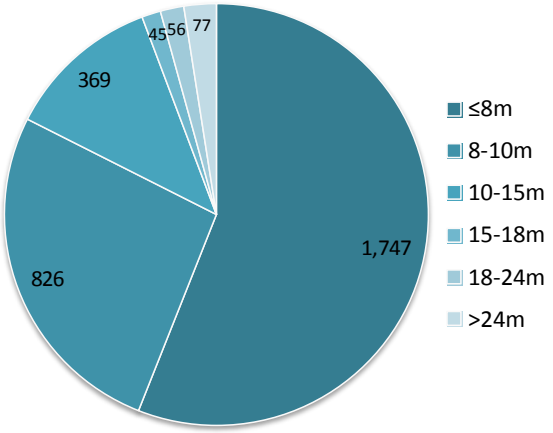
In 2011 over 2,500 under 10m vessels were registered in English ports, representing over half of the total registered under 10m vessels within the UK (Figure 3.19). The average tonnage of each under 10m English vessel is 3.5 GT and the average power is 55 kW. Approximately 550 over 10m vessels were registered in English ports in 2011, representing 40% of the total registered within the UK. The average weight of each over 10m English vessel is 97 GT and the average power is 300 kW.

Figure 3.19: Number of ≤10m and >10m vessels registered in the UK by country of administration (MMO, 2012)



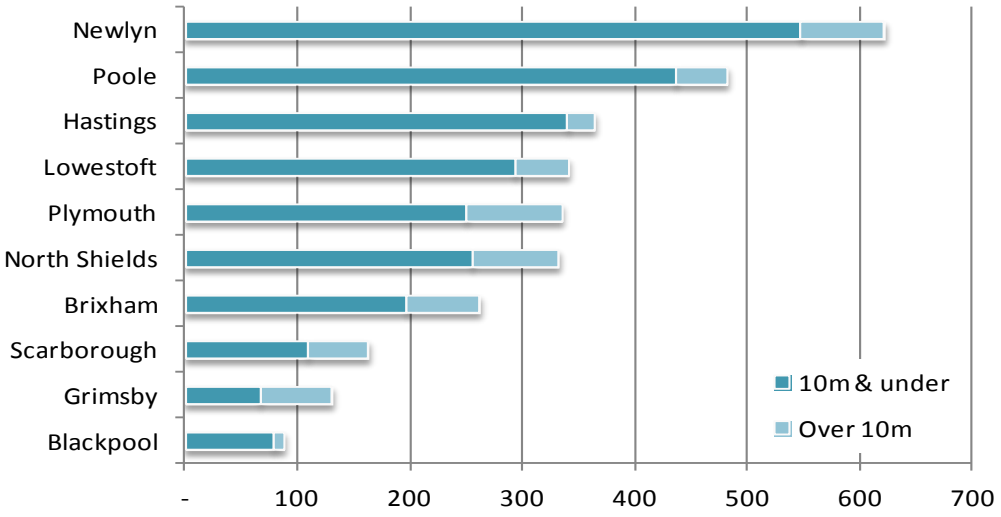
In England approximately 56% of vessels are 8m and under (Figure 3.20); 26% are 8-10m in length and 12% are 10-15m. Of the vessels over 15m in length, the highest proportion are greater than 24m.

Figure 3.20: Number of vessels registered in England by vessel length (MMO, 2012)



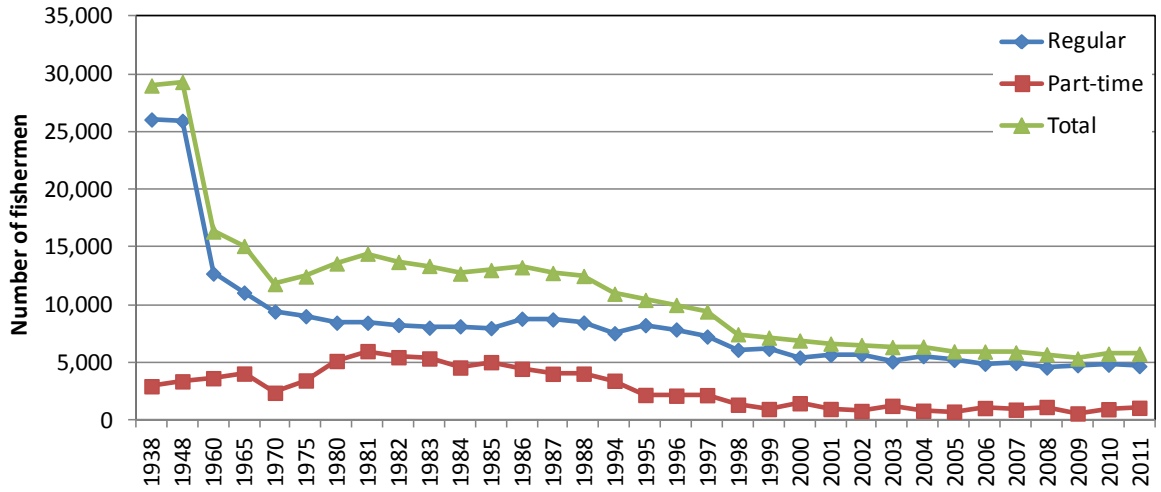
Key English administration ports and the number of vessels registered to them are presented in Figure 3.21. Newlyn represents the highest number of vessels, followed by Poole, Hastings and Lowestoft. Interestingly Grimsby represents the highest average gross tonnage (over 10 times the average at Newlyn), implying fewer, but much larger vessels registered to Grimsby compared with other English ports.

Figure 3.21: Number of vessels per English administration port, 2011 (MMO, 2012)



The long term trend in number of fishermen employed in England is presented in Figure 3.22. This is seen to drop significantly from when records began (1938) to 1999, after which they remain relatively stable up to present day. Currently 4,693 full time and 1,080 part-time fishermen work from English ports.

Figure 3.22: Number of fishermen within England from 1938 to 2011 (MMO, 2012)



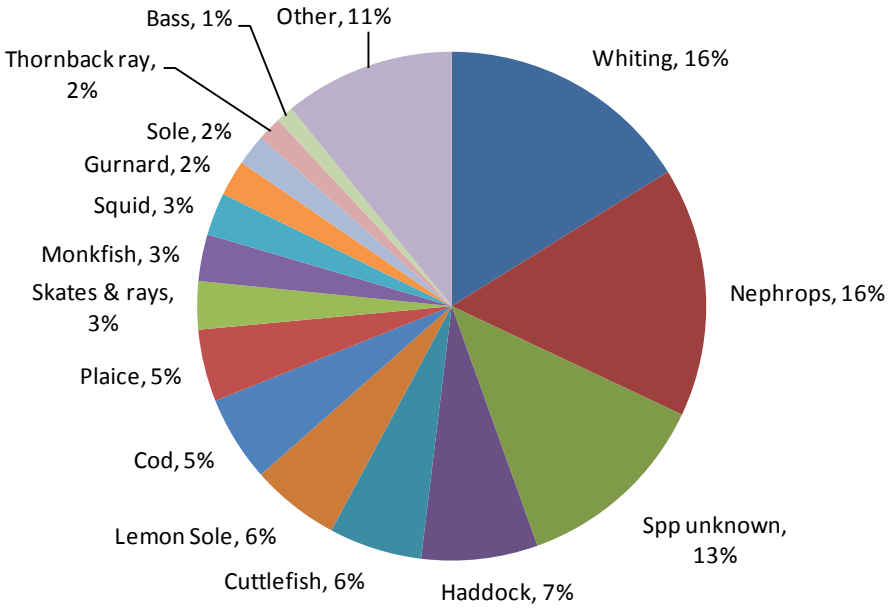
3.4 Gear types – active/mobile

The following section provides a description of the gear types commonly used within English fisheries. Before each description is a figure illustrating the proportion of species landed by weight across the period 2006-2010 by that gear type from inshore ICES rectangles i.e. those that overlap IFCA districts (as presented in Figure 1.2).

3.4.1 Demersal trawl

Demersal trawls target a wide range of mixed demersal species including whiting, nephrops, haddock, cuttlefish, lemon sole, cod and plaice, as well as other species (Figure 3.23).

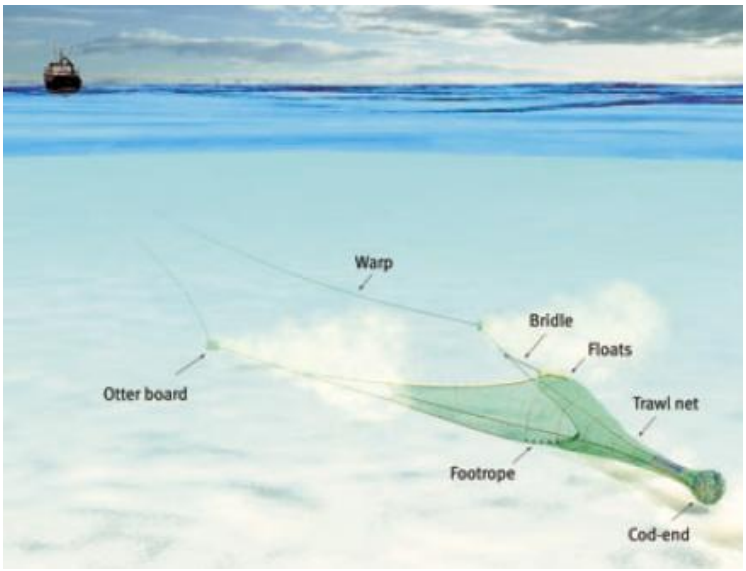
Figure 3.23: Proportion of species by weight landed by UK demersal trawlers (including otter trawl and Scottish seine) into English ports from inshore ICES rectangles, amalgamated for 2006-2010 (MMO, 2012)



Demersal otter trawl

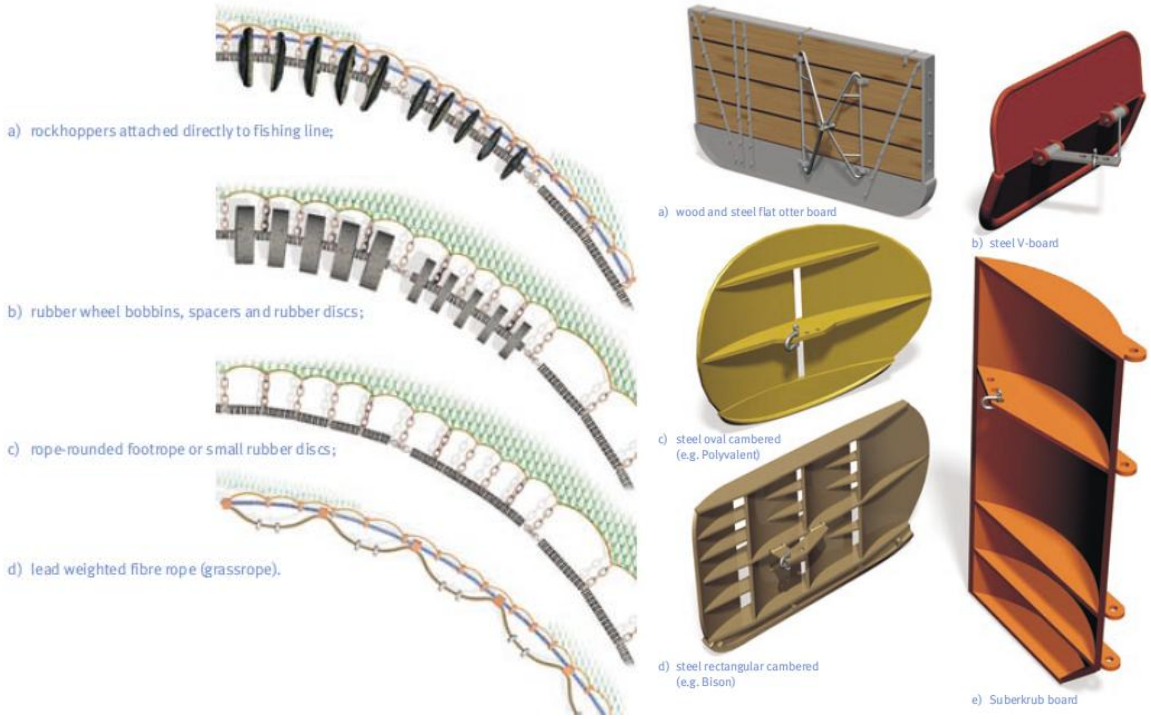
The demersal or bottom otter trawl (single, twin and pair) is a towed fishing gear designed and rigged to have bottom contact during fishing. A demersal trawl is a cone-shaped net consisting of a body, closed by a cod end knot, and with lateral wings extending forward from the opening.

Figure 3.24: Typical demersal otter trawl gear (Galbraith & Rice, 2004)



The two towing warps lead from the vessel to the otter boards which act as paravanes to maintain the horizontal net opening. These boards typically weigh between 0.5–2 t and drag across the seabed (with potential to disrupt seabed structure and habitat). The boards are joined to the wing-end by the bridles which herd fish into the path of the net. The net opening is framed by a floating headline and ground gear designed according to the bottom condition to maximise the capture of demersal target species, whilst protecting the gear from damage. Typical designs of footropes and otter boards are shown in Figure 3.25.

Figure 3.25: Typical groundrope and otter board designs found in demersal trawls (Galbraith & Rice, 2004)



Instruments to monitor gear performance are common in modern bottom otter trawling. Such instruments monitor geometry (door distance, vertical opening, bottom contact, trawl symmetry), trawl depth water temperature and the weight of catch in the trawl is also closely monitored (catch sensors) to give an indication of the appropriate moment to haul.

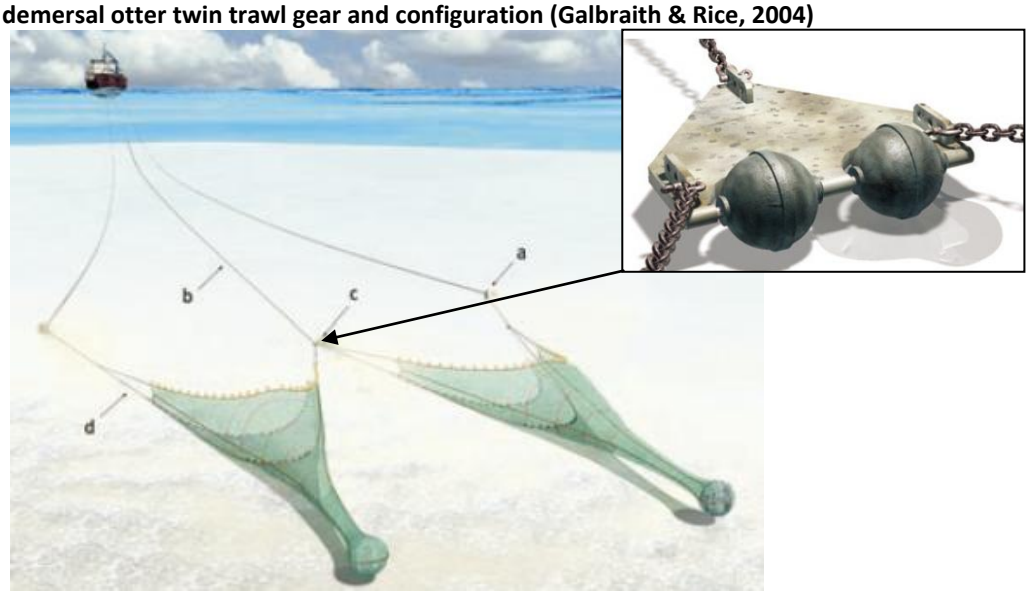
Based on EU gear classifications two distinct sets of otter trawl nets are in operation within the North Sea to target different sets of species. Mesh sizes of 100mm and greater (known as TR1) are typically used to target demersal whitefish including haddock, cod, sole, plaice and monkfish; while mesh sizes of 80-100mm (known as TR2) are typically used in the nephrops trawl fishery. Both gear types have different catch profiles for both retained and bycatch species which warrants seperate analysis at Principle 2 level. The two fleet groups distinguished within the Otter trawl catagory are:

- TR1 group: defined as demersal trawls using mesh size≥100mm; and
- TR2 group: defined as demersal trawls using mesh size between 80mm and 100mm.

Demersal otter twin trawl

Demersal otter twin trawl gear is generally used to target species located immediately on the seabed, such as monkfish, flatfish and nephrops. By towing two nets side by side the effective swept area, and hence catch, is increased. As with the single demersal otter trawl above, otter boards (a in Figure 3.26) provide the horizontal spreading forces and floats and groundropes the vertical forces. The obvious difference in rigging is the third wire or central warp (b), which runs from the vessel to the clump (c), a heavy weight which can consist of short lengths of chain cable shackled together or a custom made device designed to roll rather than be dragged along the bottom (as shown in the inset).

Figure 3.26: Typical demersal otter twin trawl gear and configuration (Galbraith & Rice, 2004)



Demersal otter pair trawl

Pair trawl works in a similar fashion to the demersal otter trawl, but is towed simultaneously by two boats, thus ensuring the horizontal opening of the net (Figure 3.27).

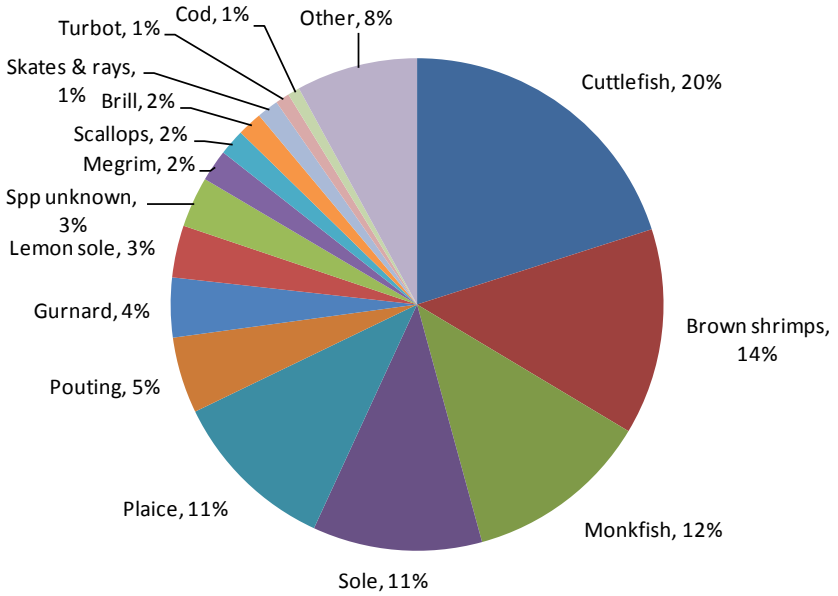
This method allows the net to be towed at a greater speed that if operated by a single boat, this means that faster moving fish can be caught. Setting and hauling of the trawl take place alternating between each vessel hauling the net. An important operational parameter is to maintain correct and steady distance between the two towing vessels. Radar measurements are commonly used for this purpose or for smaller boats a connecting line between the vessels is used.

Figure 3.27: Typical demersal otter pair trawl gear and configuration (Galbraith & Rice, 2004)

3.4.2 Beam trawl

Beam trawls target cuttlefish, brown shrimp, monkfish and species of flatfish, including plaice, sole, lemon sole, megrim and brill (Figure 3.28). Other ground feeding fish such as pouting, gurnard and rays are also caught.

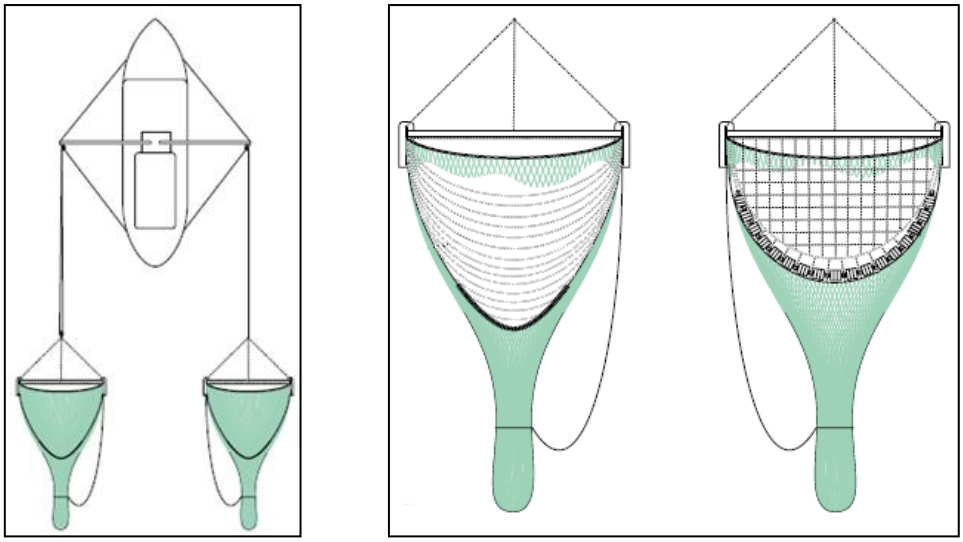
Figure 3.28: Proportion of species by weight landed by UK beam trawlers into English ports from inshore ICES rectangles, amalgamated for 2006-2010 (MMO, 2012)



Typical beam trawl configuration is presented in Figure 3.29. The substrate over which the gear is towed is usually sand and shingle, however slightly 'harder ground' can be worked with the aid of wheels on the beams. The addition of flip up footropes also facilitates the working of slightly harder ground. Furthermore the use of 'chain matrices' or 'stone mats' reduce the wear on the trawls. Beam trawls are towed either astern of the vessel on the smaller boats, or, more commonly, from derricks forward of amidships on the larger boats. National legislation limits the engine power of

beam trawlers, and the length of the beam is also restricted. Those vessels not fulfilling the requirements have to fish outside of 12 nautical miles.

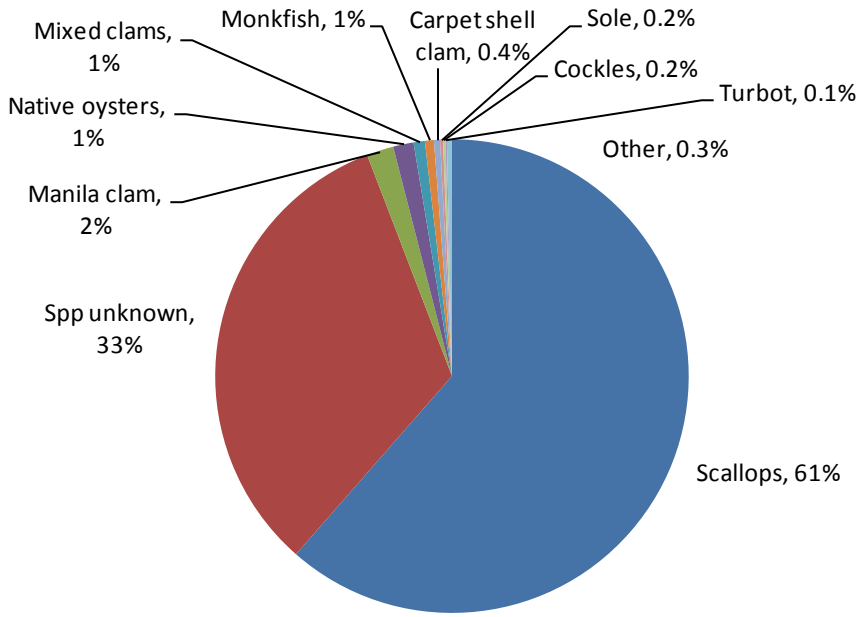
Figure 3.29: Typical beam trawl vessel (left) and gear (right) configuration (Galbraith & Rice, 2004)



3.4.3 Dredge

Key species landed by mechanised dredge include scallop, manila clam, native oysters, carpet shell clam and cockles (Figure 3.30). Small quantities of monkfish, sole and turbot are also occasionally taken as retained catch.

Figure 3.30: Proportion of species by weight landed by UK mechanized dredgers into English ports from inshore ICES rectangles, amalgamated for 2006-2010 (MMO, 2012)



Scallop dredge

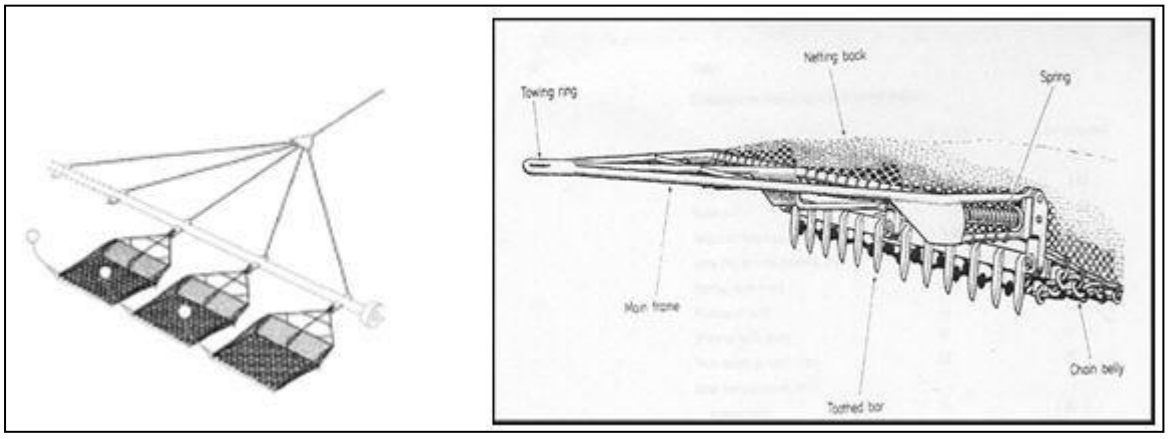
Scallops are caught using toothed spring-loaded dredges(Figure 3.31). The dredge consists of a triangular frame leading to a mouth opening normally 0.83 m wide, a tooth bar with a distance of 65 mm between teeth and teeth of approximately 8-10 cm in length, and a bag of steel rings (75 mm internal diameter) and netting back (75 mm stretched mesh). The tooth bar rakes through the sediment lifting out scallops and the spring-loaded tooth bar swings back, allowing the dredge to clear obstacles on the seabed. The compression in the springs changes and is set up in order to work in stony grounds and to reduce incidence of stones in the dredge. The dredges are held in series on two beams, which are fished on each side of the vessel.

There are a number of potential impacts of dredging activity on the wider marine ecosystem and seabed habitats including:

- Bringing stones to the surface;
- Sediment compaction and chemical changes;
- Damage to reef and similar structures;
- Non-catch mortalities; and
- Increased vulnerability to predation.

The physical effects diminish with time, depending on the level of natural disturbance, influenced by exposure to prevailing weather conditions and tidal strength, depth and sediment type. The degree of dredge effect will be influenced by a number of factors, including: the dredge type, the width and weight, sediment type, number of dredges operated, methods of fishing and whether any form of deflector or rakes are used.

Figure 3.31: Spring-loaded scallop dredge design (right) and dredges on a vessel beam (left) (Chapman et al. 1977)



Shellfish dredge

Oyster dredges operate in a simialr fashion to scallop dredges with a fixed flat bar across the forward section of the dredge. This bar digs the oysters out of the seabed; they are then collected in a bag behind the bar. Oyster dredging is typically associated with fishing vessels less than 10 metres. One or two oyster dredges are typically towed from the stern of the vessel. There is limited commercial bycatch associated with this fishery, though clams are also sometimes caught.

Hydraulic dredge

Hydraulic dredges are used for targeting cockles and razorshell (*Ensis spp)*. Hydraulic dredges operate by pumping water into the seabed, fluidising the sediment, and allowing the dredge to scoop up the target catch which is collected in a steel basket to the rear of the dredge. From there

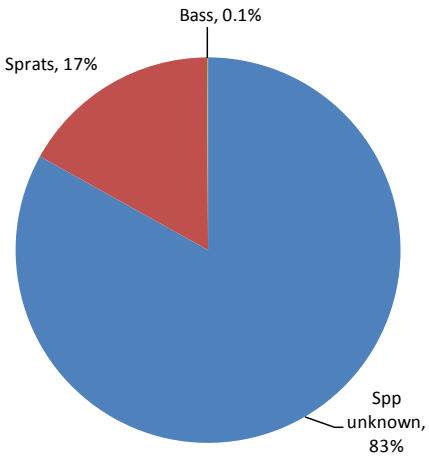
individual shellfish are transported, via a pipe with a lift pump or an air lift, onto the deck of the vessel. The dredge knife has a typical width of 1.25m. However, the overall footprint of the dredge on the seabed is somewhat larger than this, allowing for the width of the skids and other superstructures associated with the dredge.

Figure 3.2. Hydraulic dredge (FCI assessment team, 2011)

3.4.4 Pelagic trawl

Pelagic trawls target species associated with the water column that tend to move together in large shoals, such as mackerel, herring, horse mackerel and sprat. Data for UK pelagic trawl vessels landing into English ports from inshore ICES rectangles does not allow species to be identified based on confidentiality of landings (i.e. landed by less than five vessels). This is because there are comparatively low landings of pelagic species from inshore waters.

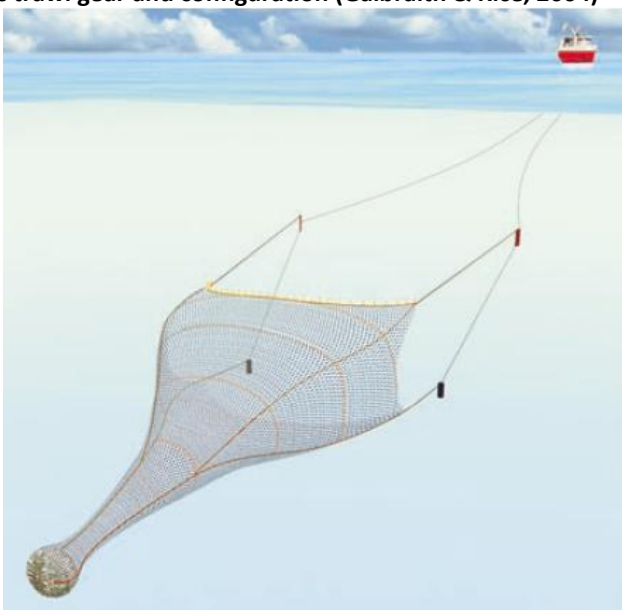
Figure 3.32: Proportion of species by weight landed by UK pelagic (or mid-water) trawlers into English ports from inshore ICES rectangles, amalgamated for 2006-2010 (MMO, 2012)



Pelagic otter trawl

Pelagic trawls are towed at the appropriate level in the water column to intercept target shoals, with gear depth being controlled by altering towing speed and/or warp length. As a result, there is no impact on bottom habitats or structures. The large net consists of a cone shaped body, ending in a cod end with lateral wings extending forward from the opening. The horizontal opening is maintained by mid-water otter boards whilst the vertical opening is maintained by a weighted ground line and floats on the headline – although these are not always required – depending on the way the net is rigged. Some vessels may also use kites to maintain headline height and net gape.

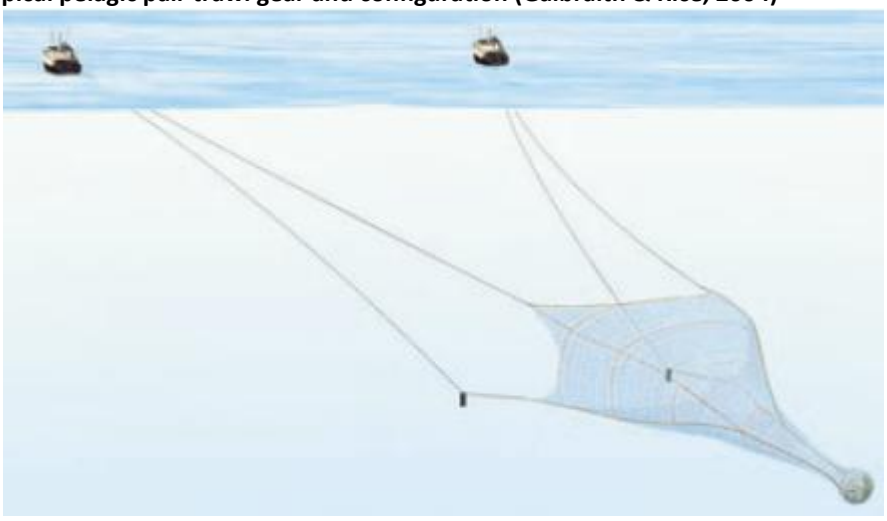
Figure 3.33: Typical pelagic trawl gear and configuration (Galbraith & Rice, 2004)



Pelagic otter pair trawl

Pelgic otter pair trawl is similar to pelagic otter trawl described previously with the exception that the net is held open by two vessels (Figure 3.34). The environemtnal impacts are similar, although pair trawls may move faster through the water.

Figure 3.34: Typical pelagic pair trawl gear and configuration (Galbraith & Rice, 2004)



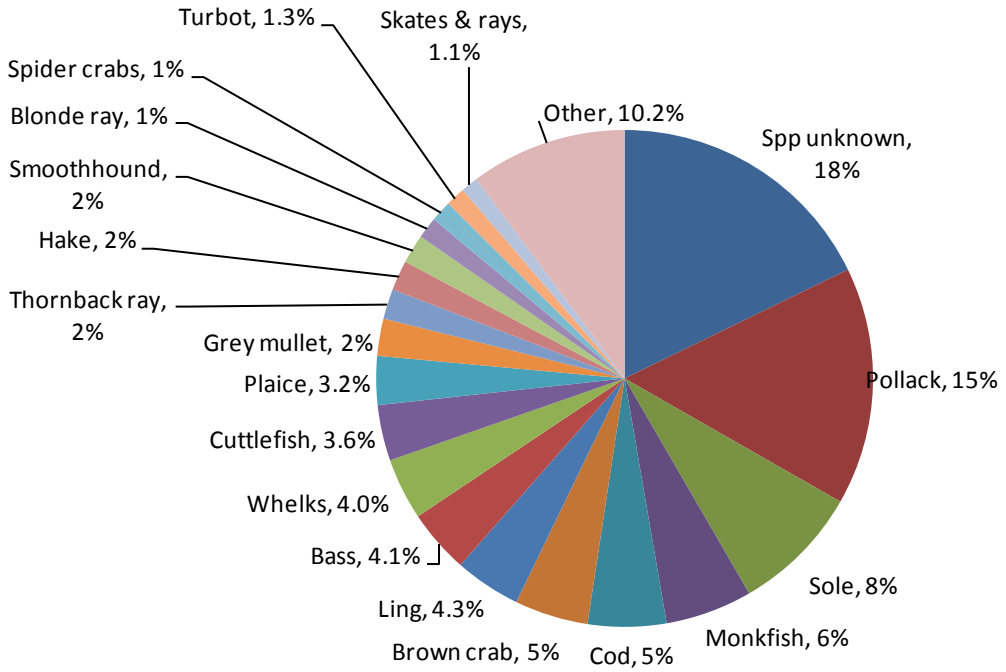
3.5 Gear types – static/passive

3.5.1 Set nets

Gill nets

Gill nets target a range of species including Pollack, sole, monkfish, cod, ling, bass, plaice and rays (Figure 3.35). Brown crab and whelks are also occasional entangled in the nets and landed.

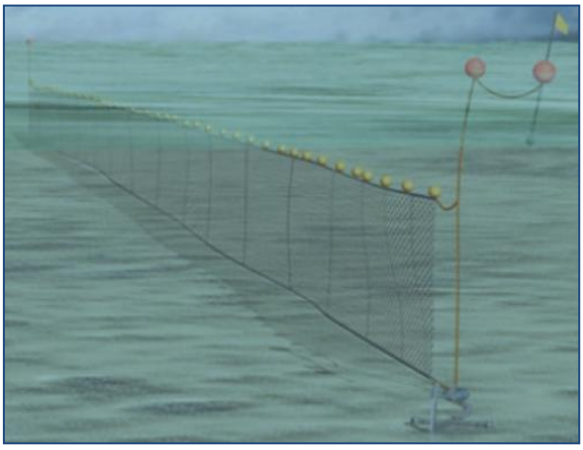
Figure 3.35: Proportion of species by weight landed by UK gill netters into English ports from inshore ICES rectangles, amalgamated for 2006-2010 (MMO, 2012)



A gill net consists of a single netting wall kept more or less vertical by a float line and a weighted ground line (Figure 3.36). Depending on the target species gill nets can be set on the bottom, in the water column or from the surface. They are kept stationary in the water by anchors on both ends and at around 50m intervals and either have a series of small buoys or floated topline to maintain the width of the net within the water. A gill net mesh size is chosen to allow only the head and gill covers of the targeted size of fish to pass through and be trapped.

The fishing properties of static nets are a function of many several parameters relating to the net including the mesh size, no. of filaments making up the twine (monofilament v. multifilament), hanging ratio – the number of meshes mounted per unit length of head/footrope, mesh colour as well as physical dimensions in terms of length and net height (measured in meshes).

Figure 3.36: Diagram of typical gill net configuration (Galbraith & Rice, 2004)

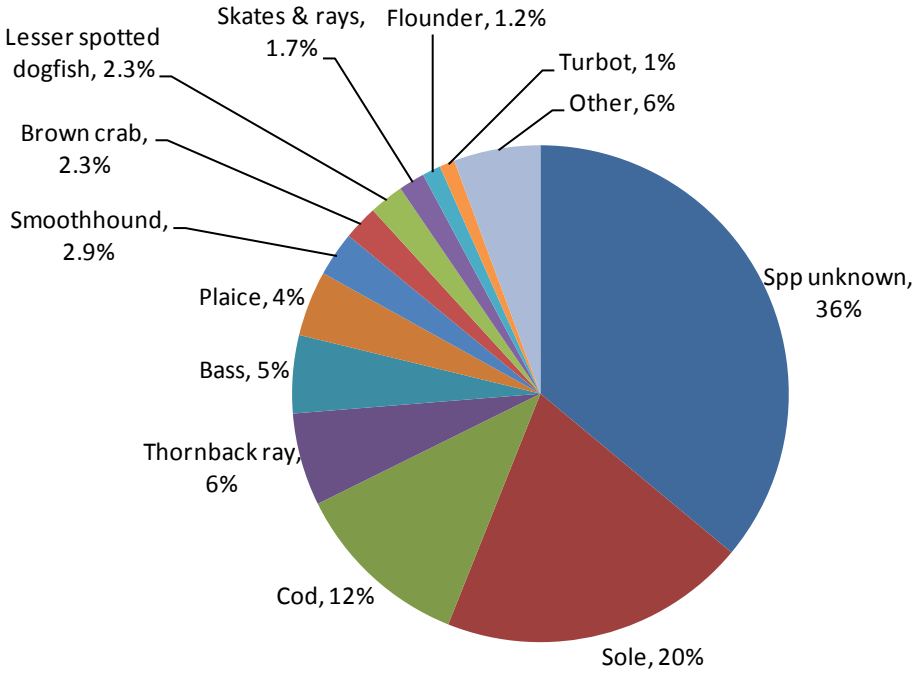


Trammel nets

Trammel nets target similar species as gill nets, but with more of a focus on those specifically associated associated with the seabed, such as sole, plaice and ray (

Figure 3.37).

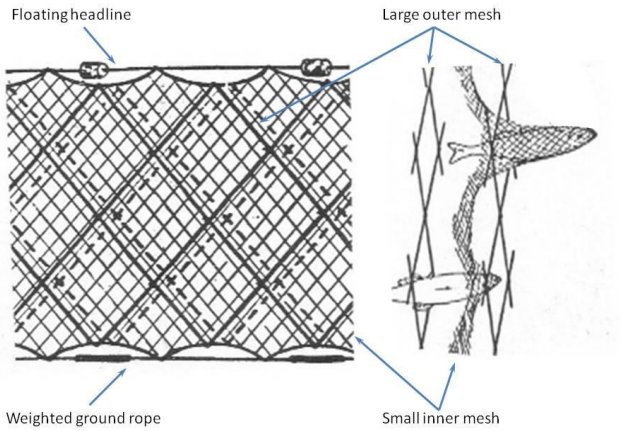
Figure 3.37: Proportion of species by weight landed by UK trammel netters into English ports from inshore ICES rectangles, amalgamated for 2006-2010 (MMO, 2012)



The trammel net is typically made up of a triple mesh net, anchored to the seabed with a total height of around 1.5m. The inner central mesh is typically 150mm, sandwiched between 2 outer mesh layers (trammels) of 350mm. By having an inner panel of small mesh netting, loosely hung between the two outer panels of large mesh netting, when a fish strikes the net it pushes the small-meshed netting forward through the large mesh, forming a pocket in which it is trapped.

Compared to gillnets the selectivity of trammel nets are lower and catches of small organisms and non-target species are common.

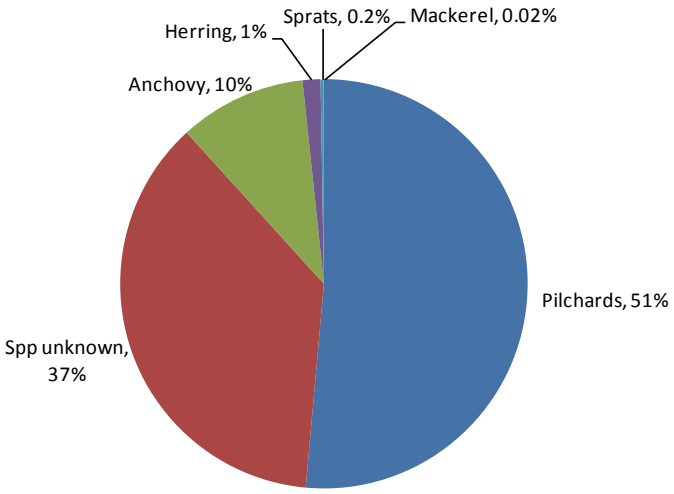
Figure 3.38: Diagram of typical trammel net configuration (FAO gear fact sheet)



Encircling gill nets

The primary target species for encircling gill nets is pilchards (51% by weight) (Figure 3.39).

Figure 3.39: Proportion of species by weight landed by UK encircling gill netters into English ports from inshore ICES rectangles, amalgamated for 2006-2010 (MMO, 2012)



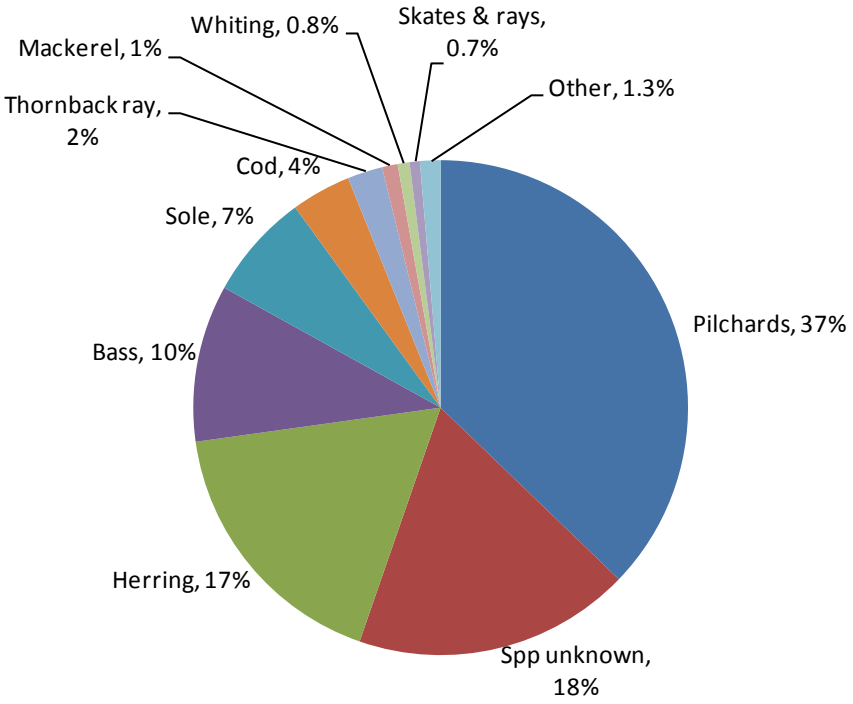
Encircling gillnets are gillnets set vertical, in shallow waters, encircling fish. After the fish has been encircled by the net, noise or other means are used to force them to gill or entangle themselves in the netting. This gear is generally used in shallow coastal waters.

Environmental impacts are low with the floatline remaining at the surface and the fishers in a permanent contact with the gear. The gear is set and immediately after scaring the fishes the gear is hauled, therefore non-target species can be returned alive.

3.5.2 Drift nets

Key species targeted by drift nets include the pelagic finfish pilchards and herring, as well as demersal species such as bass, sole, cod and thornback ray (Figure 3.40).

Figure 3.40: Proportion of species by weight landed by UK drift netters into English ports from inshore ICES rectangles, amalgamated for 2006-2010 (MMO, 2012)



Drift nets are typically rigged from a single sheet of monofilament with a depth of up to twenty feet. The float line keeps the top on the surface whilst the lead line stands the net in the water. Drift nets are shot across the tide and allowed to drift.

The drift net cannot truly be considered a static gear, as it is not attached to the seabed. Driftnets are often associated with bycatch of marine mammals. Therefore, within certain IFCAs (such as Sussex) a byelaw requires that such nets be attended at all times to avoid issues of gear loss and incidental entaglement.

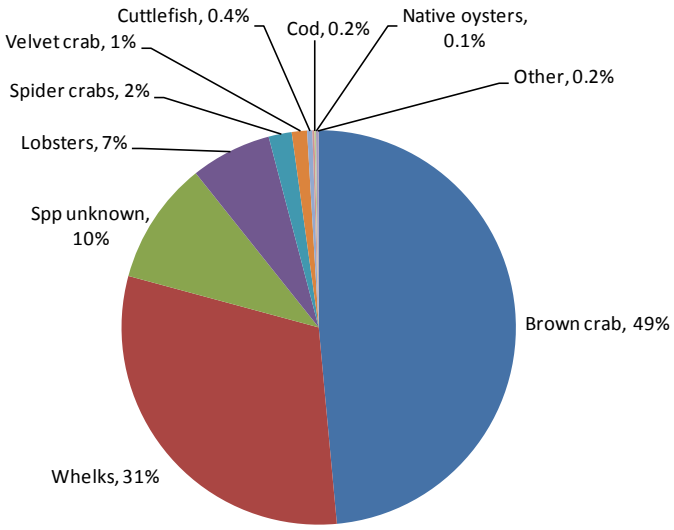
3.5.3 Pots

The landings data recorded for 'pots' includes both creels and whelk pots. Key species are therefore brown crab, whelks, lobster, spider crab, velvet crab and the occasional cod (Figure 3.41).

Creel / parlour pots

Fleets of baited pots are placed on the seabed. Fishermen targeting inshore areas typically haul pots every 24-48hrs (weather permitting) to harvest any catch and replace bait. Gear will often be re-set in the same place for several days. The target crustaceans crawl into the pots voluntarily, but the pot is designed in such manner that the entrance serves as a non-return device. Traditionally pots have been wood, but in recent years pots are metal, or increasingly plastic, with nylon netting.

Figure 3.41: Proportion of species by weight landed by UK potters into English ports from inshore ICES rectangles, amalgamated for 2006-2010 (MMO, 2012)



Inkwell pots are commonly used in the English Channel by the Cornish and Devon crab fleets. They are constructed of a netting cover with plastic 'bucket' entrance and a heavy plastic matrix base. The stanchions, base and top area are protected with either rope or old car tyre. A bait band formed by a rubber cross section of car inner tube is placed around the outside wall of the entry bucket, where portions of bait are held in place away from the outside walls of the pot.

Traditionally fleets of pots would have been hauled by hand but today even the smallest commercially operating boats are equipped with hydraulic haulers. This method of fishing has a very low level of negative interaction with the seabed habitat. Mesh size allows juveniles to escape and undersized species can typically be released alive when the catch is sorted. Occasionally gear may be lost, particularly after prolonged periods of poor weather, or if gear becomes entangled with passing shipping or mobile fishing gears. There is therefore a small risk of lost pots continuing to fish and thus "ghost fish".

Figure 3.42: Typical creel (left), parlour (middle) and inkwell (right) pots

Whelk pots

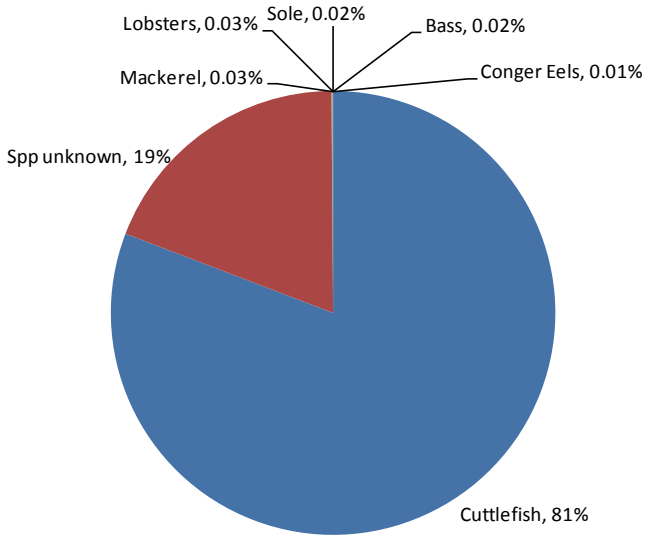
Whelks are targeted in either reclaimed 25 litre drums that are weighted at one end with concrete or in purpose designed pots. The pots are shot in strings in a similar fashion to crab and lobster pots. Whelk pots are baited, typically with crab or 'dogfish'. Netted dog whelks and hermit crabs are caught as bycatch. Whelks are typically targeted on 'softer' sandy gravel ground.

Traps

Cuttlefish are targeted in traps (Figure 3.43). There are various trap designs used including rectangular (e.g. at Hastings) and circular (e.g. at Eastbourne). Cuttlefish traps are fished in strings of up to 20 traps. The traps are baited with a live female cuttlefish, or a white ceramic tile, the purpose

of which is to attract the breeding molluscs. The cuttlefish congregate inshore to bread and the fishery targets the cuttlefish as they are spawning.

Figure 3.43: Proportion of species by weight landed by UK vessels using traps into English ports from inshore ICES rectangles, amalgamated for 2006-2010 (MMO, 2012)

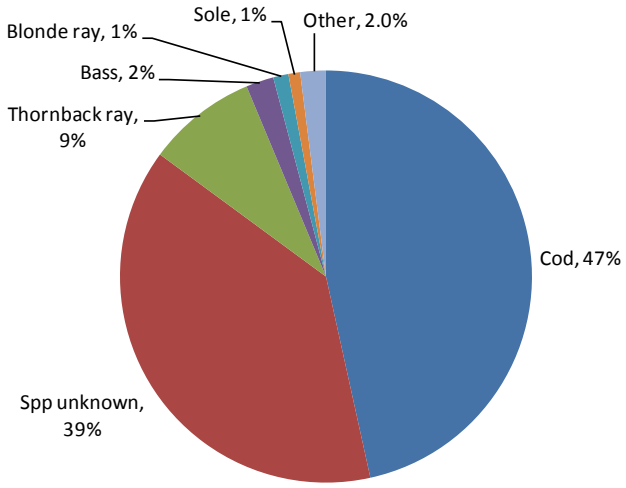


3.5.4 Line

Long line

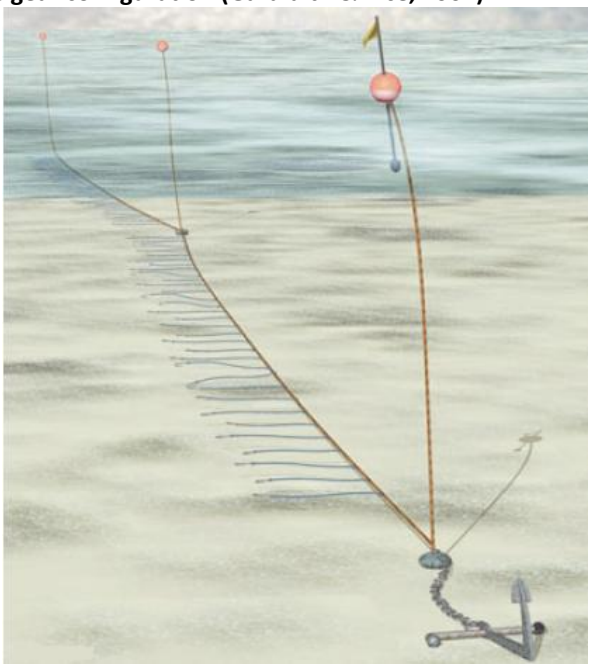
Long lines predominately target cod and ray species, as well as bass (Figure 3.44).

Figure 3.44: Proportion of species by weight landed by UK longliners into English ports from inshore ICES rectangles, amalgamated for 2006-2010 (MMO, 2012)



Longlines are market by Dan buoys with vessel identification and radar reflector. Longline fishing is a method consisting of a long line (Figure 3.45), onto which leaders are fixed at regular intervals (usually every 2-2.5 meters). Attached to these are hooks with some sort of bait on them (approximately 250 hooks per line and about 12-16 lines are used per vessel). Cod longline fishing uses squid and herring as bait (approximately 10-30 kilograms per day). Longline gear is deployed at 35-60 meters of depth.

Figure 3.45: Typical long line gear configuration (Galbraith & Rice, 2004)



Pole & line and handline

Pole and line and hand lines are gear where the fish is attracted by a natural or artificial bait (lures) placed on a hook fixed to the end of a line or snood, on which they get caught. They typically target mackerel (Figure 3.46)

Hooks or metallic points (jigs) are also used to catch fish by ripping them when they pass in its range of movement. Hook and line units may be used singly or in large numbers. These gears are hauled by hand in small-scale fisheries.

Figure 3.46: Proportion of species by weight landed by UK pole & line and handline into English ports from inshore ICES rectangles, amalgamated for 2006-2010 (MMO, 2012)

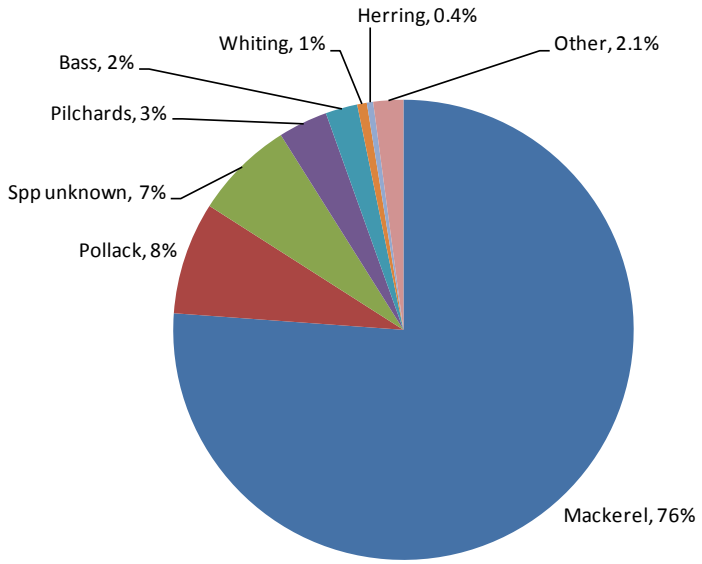
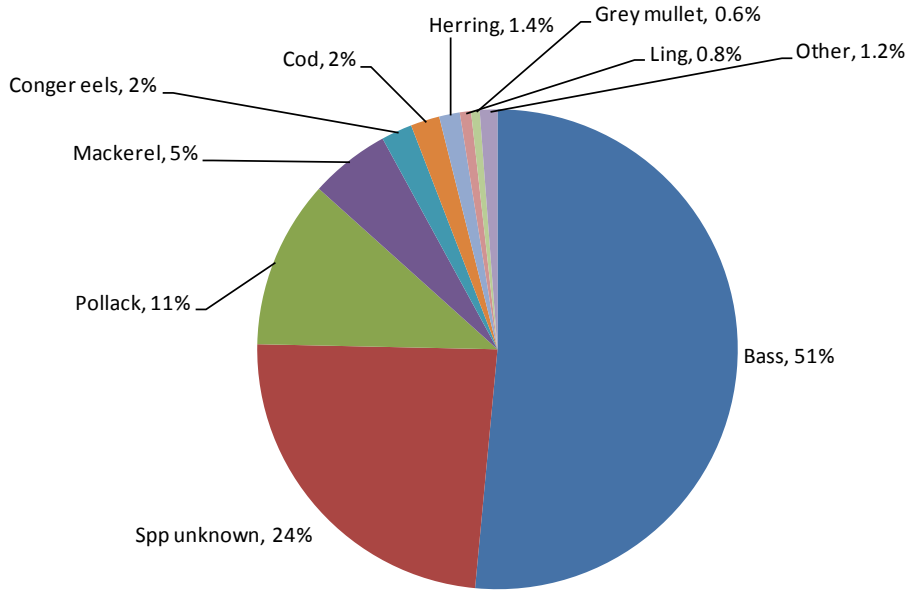


Figure 3.47: Proportion of species by weight landed by UK hook and line into English ports from inshore ICES rectangles, amalgamated for 2006-2010 (MMO, 2012)



3.5.5 Hand collection

Diving

Scallops can be harvested by divers, whereby scallops are hand-caught on the ocean floor. In contrast to scallops captured by a dredge, diver scallops tend to be less gritty. They are often considered by consumers to be more ecologically friendly, as the harvesting method does not cause damage to the environment. There are no species composition data for this method of collection.

Raking

Hand raking is often used when collecting cockles. Rakes are hand-held devices used for scraping the seabed to dislodge cockles, either at low tide or when sand is partially covered by water and a jigging motion is used to semi-fluidize the top layers of the seabed. Hand rakes consist of a pole with a rake and a net or mesh bag attached (Figure 3.48). There are no species composition data for this method of collection.

Figure 3.48: Cockle fishermen catching cockles with a cockle rake (right). Rake to which a netted bag is attached (left)

Source: http://www.ecomare.nl/en/ecomare-encyclopedie/man-and-the-environment/fisheries/fisheries-by-sort/shellfish-fisheries/manual-cockle-fisheries/

4 English Marine Environment and Ecosystem

4.1 Endangered, threatened and protected species

Endangered, threatened or protected species (ETP) are those that are recognised by national and/or binding international agreements to which jurisdictions controlling the fishery under assessment are party. By this definition the species to be considered therefore must be protected. Endangered and/or threatened species (such as those listed on OSPAR Appendix II or on the IUCN Red List) cannot be included within this category in less they also have some form of national or international protection.

Species considered within the ETP component are presented in Table 4.1 which highlights the relevant national or international regulations for each species.

Table 4.1: Protection of species included within ETP category

Species	Scientific name	CITES APP I & II	EC 812/2004	EC 43/2009 23/2010	BERN	Habitats Directive Annex II	Birds Directive	BONN inc. Ascobans
Mammals								
Harbour porpoise	*Phocoena phocoena*	App II			App II			App IV
Bottlenose dolphin	Tursiops truncatus	App II						
Short-beaked common dolphin	*Delphinus delphis*	App II						
All cetaceans	*Cetacea spp*	App II						
Common seal	Phoca vitulina							
Grey seal	*Halichoerus grypus*				App III			App II
Otter	*Lutra lutra*	App I						
Fish								
Angel shark	*Squatina squatina*							
Common skate	*Dipturus batis*							
Spurdog	*Squalus acanthias*							
Basking shark	*Cetorhinus maximus*	App II						
Sturgeon	*Acipenser sturio*	App I				Priority		
Allis shad	Alosa alosa							
Twaite shad	Alosa fallax							
European eel	Anguilla anguilla	App II						
Atlantic salmon	Salmo salar							
Sea lamprey	*Petromyzon marinus*							
Repriles								
Marine turtles	*Cheloniidae spp*	App II						
Leatherback turtle	*Dermochelys coriacea*	App I						
Birds								
Bird spp								

4.1.1 CITES

The Convention on Trade in Endangered Species of Wild Flora and Fauna (CITES - also less commonly known as the Washington Convention) was adopted in Washington DC, United States of America in March 1973 and entered into force in July 1975. CITES aims to regulate international trade in species which are endangered or which may become endangered if their exploitation is not controlled. Species covered under CITES are listed in three Appendices, according to the level of protection they need.

CITES is implemented within Europe through two EC Regulations (338/97 and 865/06 as amended). These Regulations implement CITES in a stricter manner than is required by the Convention. For instance they include certain non-CITES species, and also contain provisions to prohibit or restrict imports of species which are considered to be a threat to native EC flora and fauna.

The UK ratified CITES in August 1976. The Endangered Species (Import & Export) Act 1976 was the first piece of legislation to give effect to CITES. It has been substantially amended and is now largely superseded by the European Regulations. The Control of Trade in Endangered Species (Enforcement) Regulations 1997 (COTES) make provision for enforcement of the European Regulations.

4.1.2 EC Regulation 812/2004

EC Regulation 812/2004, which concerns the incidental catches of cetaceans in fisheries, came into force on 26th April 2004. The measures pertinent to the UK include:

- The coordinated monitoring of cetacean bycatch through compulsory onboard observers for given fisheries; and
- The mandatory use of acoustic deterrent devices ('pingers') in certain fisheries.

EC Regulation 812/2004 requires that sampling should be geared to achieve a bycatch estimate with a coefficient of variation (CV) of less than 0.3. This can only be achieved if there is one or more observed bycatch event. In the absence of any observed bycatch, and assuming continued monitoring is needed, the UK uses the 'pilot study' levels of 10% and 5% for the various fishery segments as the most appropriate approach to setting monitoring requirement levels. The European Commission has recognised the UK scheme as one of the best bycatch observer schemes in Europe (JNCC, 2010).

The two main species affected by fishing in UK waters are the harbour porpoise and the short-beaked common dolphin.

4.1.3 EC Regulations 43/2009 23/2010

EC regulation 43/2009 (which came into force in January 2009) prohibits the landing of common skate by EU vessels. In addition EC regulation 23/2010 stresses this ban for common skate and further sets a zero TAC for spurdog. When caught it is required that common skate and spurdog are promptly released unharmed to the extent practicable.

Recent research undertaken in commercial set net fisheries (gill, trammel and tangle) off Cornwall found consistently high survival rates for common skate (92% alive) and spurdog (73%) prior to discarding (Bendall *et al.*, 2012).

4.1.4 BERN Convention

The Convention on the Conservation of European Wildlife and Natural Habitats (the Bern Convention) was adopted in Bern, Switzerland in 1979, and came into force in 1982. The principal aims of the Convention are to ensure conservation and protection of wild plant and animal species and their natural habitats (listed in Appendices I and II of the Convention), to increase cooperation between contracting parties, and to regulate the exploitation of those species (including migratory species) listed in Appendix 3. To this end the Convention imposes legal obligations on contracting parties, protecting over 500 wild plant species and more than 1000 wild animal species.

To implement the Bern Convention in Europe, the European Community adopted Council Directive 79/409/EEC on the Conservation of Wild Birds (the EC Birds Directive) in 1979, and Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the EC Habitats Directive) in 1992. Among other things the Directives provide for the establishment of a European network of protected areas (Natura 2000), to tackle the continuing losses of European biodiversity on land, at the coast and in the sea to human activities.

The UK ratified the Bern Convention in 1982. The Convention was implemented in UK law by the Wildlife and Countryside Act (1981 and as amended). As the inspiration for the EC Birds and Habitats Directives, the Convention had an influence on the Conservation (Natural Habitats &c.) Regulations (1994) which were introduced to implement those parts of the Habitats Directive not already covered in national legislation.

Details of the Birds Directive are provided below; the Habitats Directive is summarised in Section 4.2.

4.1.5 Birds Directives

The European Union meets its obligations for bird species under the Bern Convention and Bonn Convention and more generally by means of Directive 2009/147/EC (Birds Directive) on the conservation of wild birds (the codified version of Council Directive 79/409/EEC as amended). The Directive provides a framework for the conservation and management of, and human interactions with, wild birds in Europe. It sets broad objectives for a wide range of activities, although the precise legal mechanisms for their achievement are at the discretion of each Member State (in the UK delivery is via several different statutes).

The main provisions of the Directive include:

- The maintenance of the populations of all wild bird species across their natural range (Article 2) with the encouragement of various activities to that end (Article 3).
- The identification and classification of Special Protection Areas (SPAs) for rare or vulnerable species listed in Annex I of the Directive, as well as for all regularly occurring migratory species, paying particular attention to the protection of wetlands of international importance (Article 4).
- The establishment of a general scheme of protection for all wild birds (Article 5).
- Encouragement of certain forms of relevant research (Article 10 and Annex V).

The Directive has facilitated much co-operative conservation action across the European Union. Many initiatives have increased understanding of conservation needs, including the development of international action plans for the most threatened species.

In the UK, the provisions of the Birds Directive are implemented through the Wildlife & Countryside Act 1981 (as amended), the Conservation (Natural Habitats, & c.) Regulations 2010 (as amended); the Offshore Marine Conservation (Natural Habitats & c.) Regulations 2007 as well as other legislation related to the uses of land and sea.

A very wide range of other statutory and non-statutory activities also support the implementation of the Birds Directive in the UK. This includes national bird monitoring schemes, bird conservation research, and the UK Biodiversity Action Plan which involves action for a number of bird species and the habitats which support them.

4.1.6 Wildlife and Countryside Act

4.1.7 ETP species records

Species records are presented for three key ETP species as follows: harbour porpoise, common skate and spurdog.

Harbour porpoise Phocoena phocoena

The harbour porpoise is listed in annex II and IV of the Habitats Directive (92/43/EEC), annex II of the Bern convention, annex II of the Bonn convention and annex II of CITES. Furthermore, it is the flagship species in the "Agreement on the Conservation of Small Cetaceans of the Baltic, North East Atlantic, Irish and North Seas" (ASCOBANS). ASCOBANS was concluded in 1991 under the auspices of the Convention on Migratory Species (CMS or Bonn Convention) and entered into force in 1994. Ten Member States are party to the agreement, including UK. The agreement seeks to formalise and coordinate efforts to conserve the small cetacean species shared between member countries in the ASCOBANS area, conscious that the management of threats to their existence, such as bycatch, habitat deterioration and other anthropogenic disturbance, requires concerted and coordinated responses, given that migrating cetaceans regularly cross national boundaries. A Conservation and Management Plan forming part of the Agreement obliges Parties to engage in habitat conservation and management, surveys and research, pollution mitigation and public information.

ASCOBANS has set a clear limit for incidental bycatch of harbour porpoise defining "unacceptable interactions" as being a total anthropogenic removal above 1.7% of the best available estimate of abundance and set the intermediate precautionary objective of reducing bycatch to less than 1% of the best available population estimate.

The gear of most concern in relation to interactions with this species is set nets. The harbour porpoise is unable to detect the presence of nylon mesh in water and entanglement risks are high for this species in both gillnet and trammel net fisheries.

The harbour porpoise is reported as the most abundant cetacean in north-eastern European shelf waters with North Sea populations estimated at 280,000 individuals (Hammond et al, 1995 as cited in JNCC, 2003). The distribution of harbour porpoise is presented in Figure 4.1.

Two major abundance surveys have been conducted - SCANS in 1994 and SCANS-II in 2005 – the results of which are presented in Figure 4.2.

Figure 4.1: Distribution of harbour porpoise (JNCC, 2003)

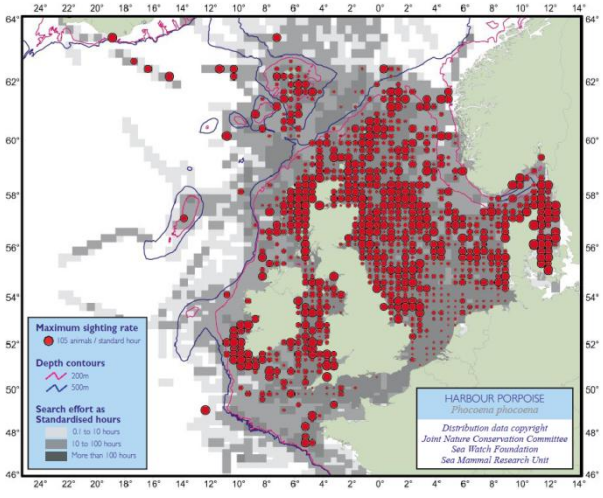
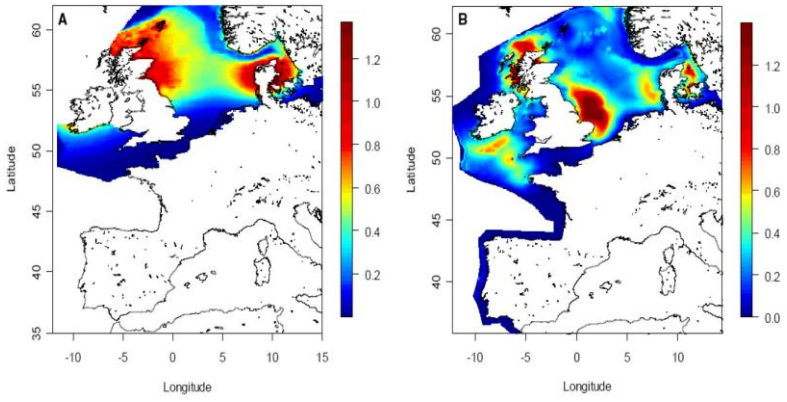
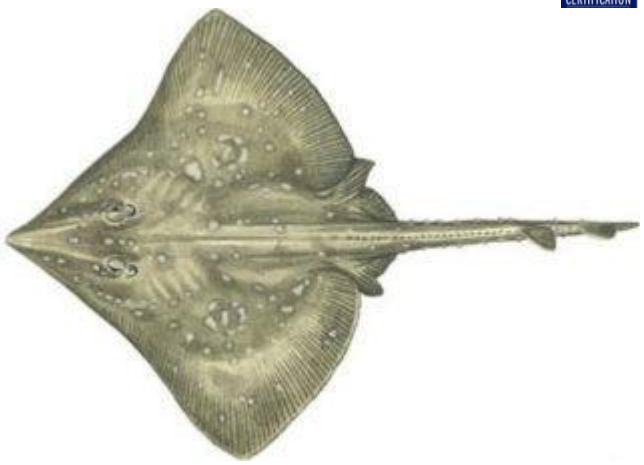


Figure 4.2: Density surface modelling of the SCANS I survey in 1994 (panel A) and SCANS II survey in 2005 (panel B) based on the visual sightings. The colours indicate the absolute density in animals/km2 (Hammond et al. in prep as cited in Teilmann et al., 2008)



Common skate Dipturus batis



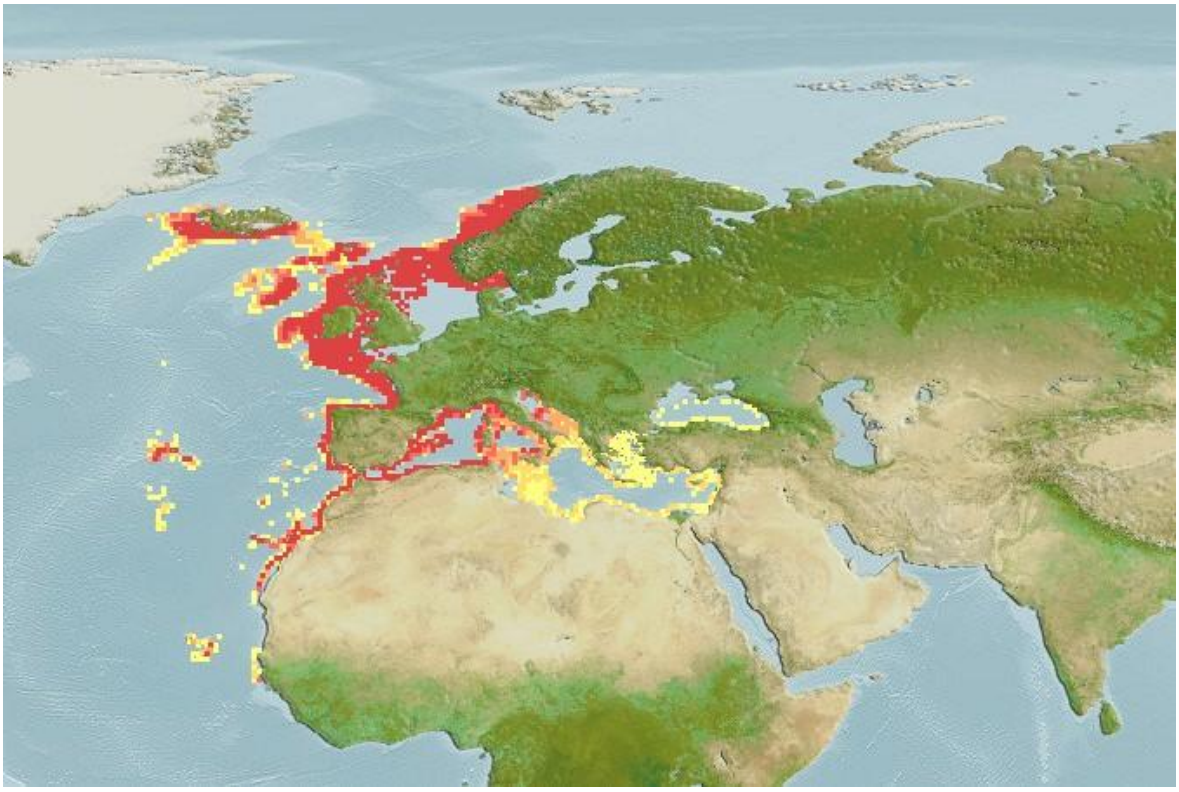
The common skate was formerly widely distributed over much of the North Sea but has declined throughout its range and is now only found rarely, mainly in the northern North Sea (ICES Advice 2008, Book 6: 6.4.30). It is the largest of the European batoid fish, reaching lengths of 285 cm and weights of 100kg. It is a demersal species and frequently inhabits coastal areas and shelf seas. Fisheries independent surveys that have informed ICES Working Group reports found the distribution of common skate to occur across depths of 85-1000 m.

The magnitude of decline is differentially well documented in various areas, but it is known to have severely declined in most shelf areas (ICES, 2002). For example, *D.batis* has been commercially extinct in the Irish Sea for some years (Brander,1981) and has declined severely in the North Sea (Walker & Hislop, 1998). The decline of the common skate has been described as the first clear case of a fish species brought to the brink of extinction by commercial fishing (Brander,1981).

Common skate are likely to form incidental bycatch within gillnet and trawl fisheries targeting high-value telesosts (e.g. sole, monkfish and hake).

The common skate was assessed by IUCN as 'Endangered' in 2000 and upgraded to 'Critically Endangered' in 2006, suggesting it 'is facing an extremely high risk of extinction in the wild'(IUCN, 2008). D. batis is also a Biodiversity Action Plan (BAP) species in the UK, and was listed on the OSPAR Priority List of Threatened and Endangered Species.

Figure 4.3: Global distribution map (Fishbase, 2012)

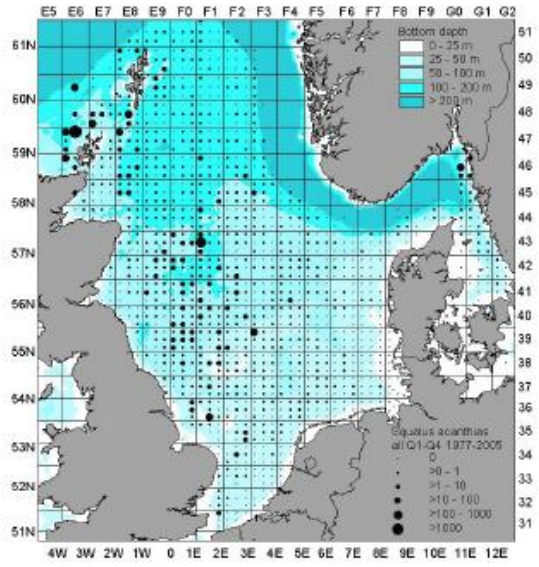


Spurdog Squalus acanthias

Spurdog occurs throughout the water column along the continental shelf of north-west Europe and has been recorded to depths of 900 m, but is most common from 10–200 m. Spiny dogfish are highly migratory, travelling in large, dense "packs", segregated by size and sex. Primarily epibenthic, they are not known to associate with any particular habitat.

Spurdog is considered to be vulnerable to over-exploitation by fisheries because of its late maturity, low reproductive capacity, longevity, long generation time (25–40 years) and hence a very low intrinsic rate of population increase (2–7% per annum) (Fordham *et al.*, 2006).

Figure 4.4: Average annual catch rate for spurdog in the IBTS survey for the years 1977-2005 (ICES)

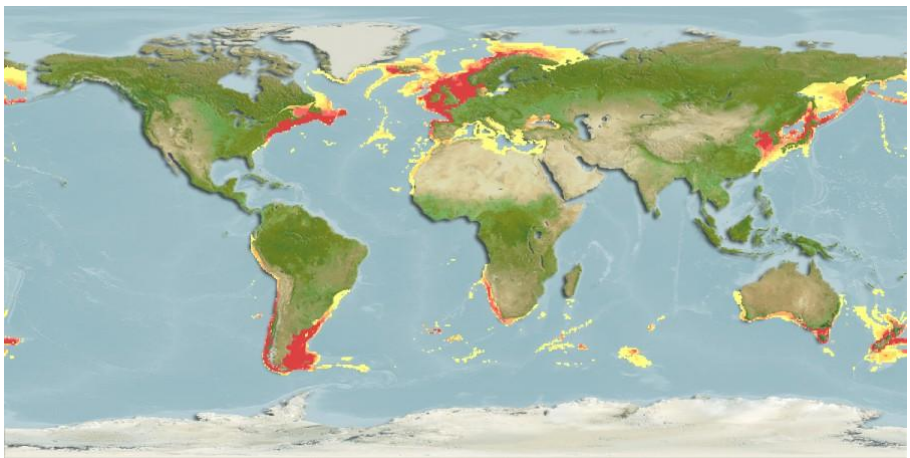


Spurdog is an opportunistic feeder that takes a wide range of predominantly pelagic prey. Important fish prey includes herring, sprat, small gadoids, sandeel, and mackerel, but crustaceans (swimming crabs, hermit crabs and euphausids), squid and ctenophores also represent important prey.

It is mainly caught as by-catch in trawl, gillnet and longline fisheries, especially in inshore waters. Spurdog are captured less frequently in beam trawl fisheries, which may be due in part to gear selectivity, but also most beam trawling activity occurs in the southern North Sea, where spurdog are less abundant.

Heessen et al. (2003, as cited in Fordham *et al.*, 2006) describe the Northeast Atlantic stock as severely depleted, with an estimated decline in biomass from 1977 of over 5,000,000 (at which time landings had already fallen to 60% of peak catches) to well under 100,000 in 2001; a decline in biomass of well over 98%. Estimates of total numbers of mature adults in 2000 range from 100,000 to 600,000 individuals. Hammond and Ellis (2004) estimate depletion of this stock to about 5% of virgin biomass. The decline in biomass over the >75 year three generation period for this stock is also greater than 90% and the stock is therefore assessed as Critically Endangered on the IUCN Red List.

Figure 4.5: Global distribution map (Froese, 2005)



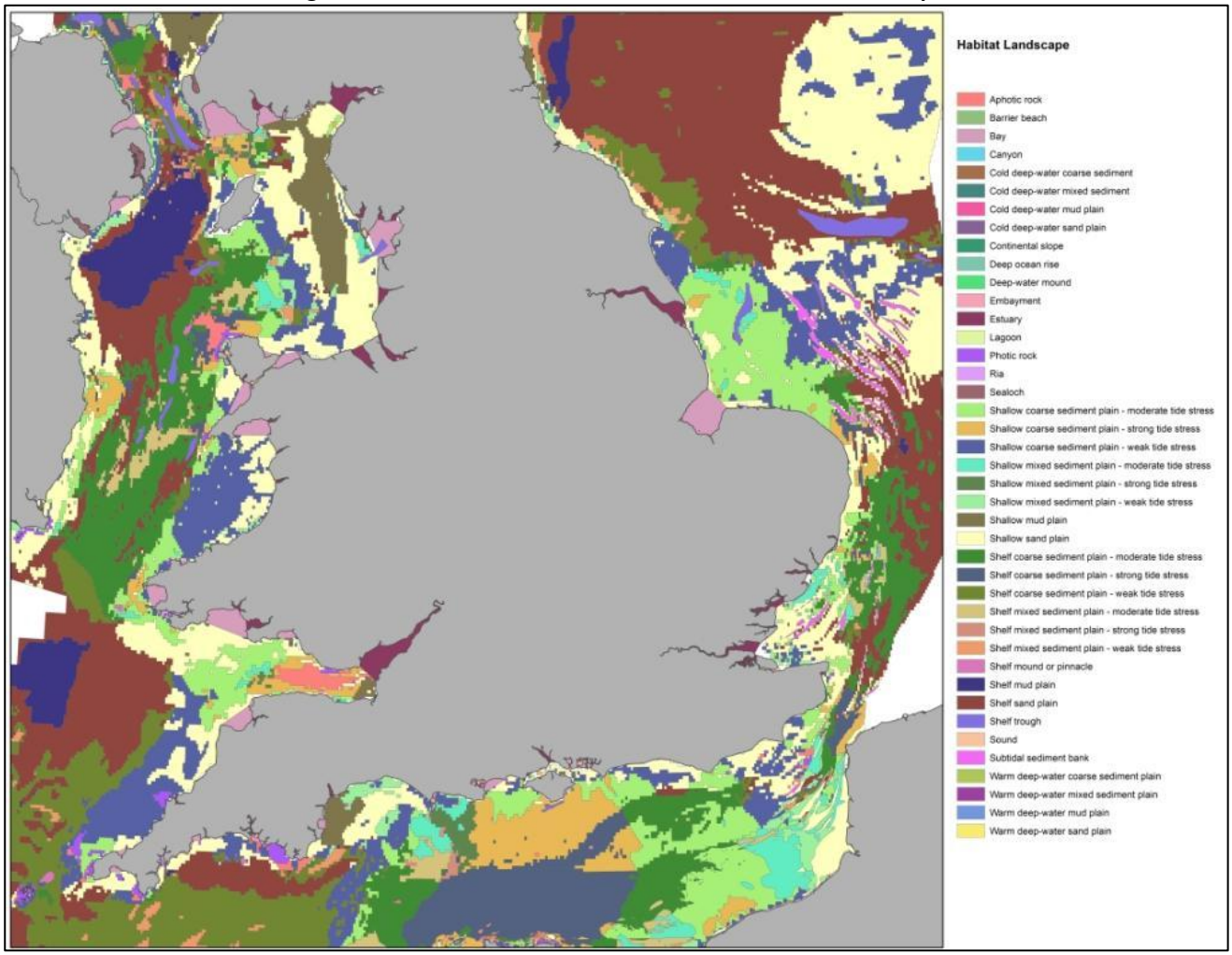
4.2 Habitats

4.2.1 Habitat mapping

The European Nature Information System, EUNIS, is part of the Biodiversity data centre (BDC). The EUNIS Habitat types classification is a comprehensive pan-European system to facilitate the harmonised description and collection of data across Europe through the use of criteria for habitat identification. Habitat type is defined for the purposes of the EUNIS habitat type classification as follows: 'Plant and animal communities as the characterising elements of the biotic environment, together with abiotic factors operating together at a particular scale.'

In the UK, the UKSeaMap 2010 project provides a map of predicted EUNIS habitats within the UK EEZ (Figure 4.6).

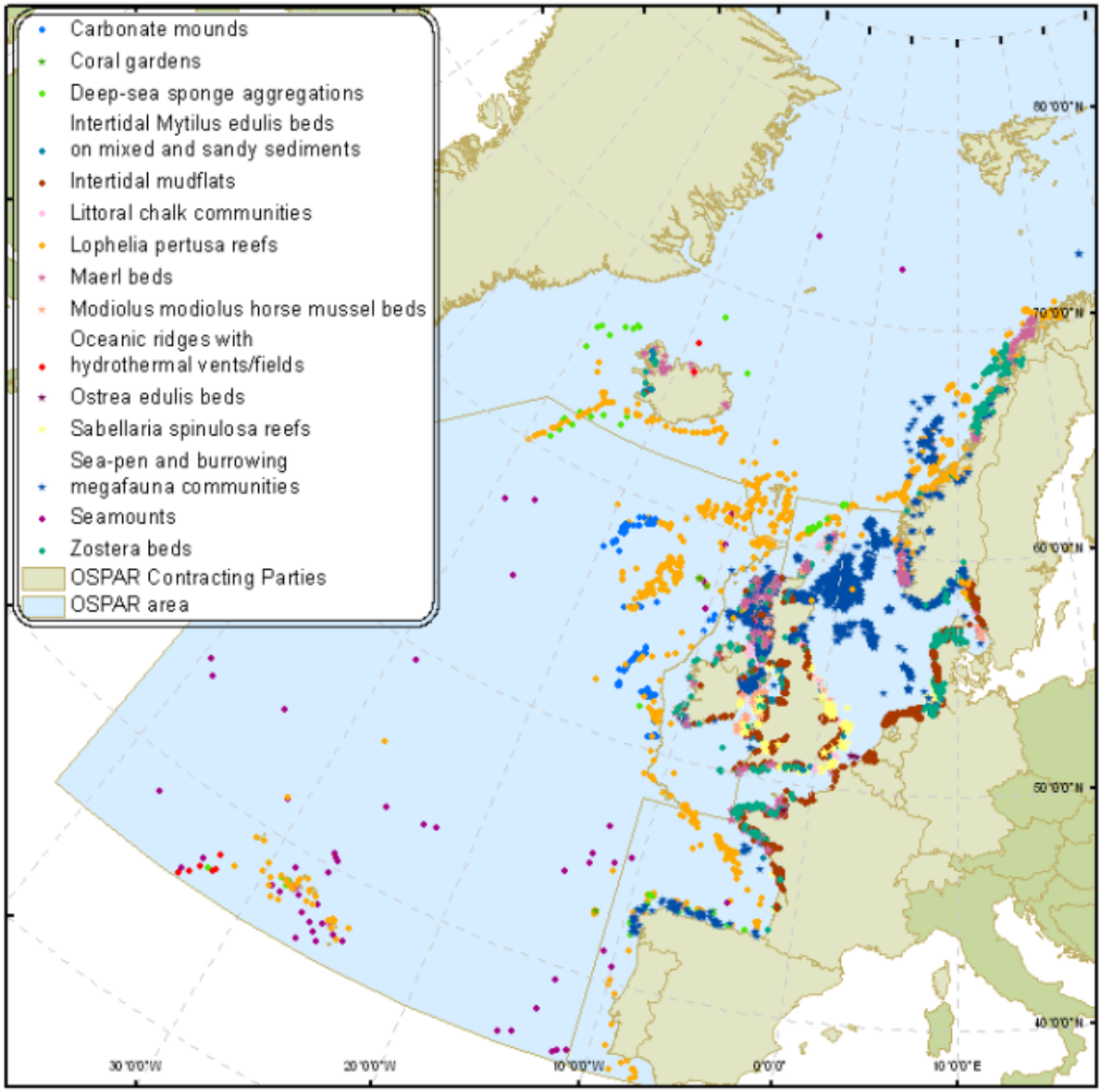
Figure 4.6: EUNIS habitat classification for UK seabed landscape



4.2.2 OSPAR priority habitats

In 2003, the OSPAR Biodiversity Committee agreed to a programme to map the distribution of priority habitats on OSPAR's list of threatened and/or declining species and habitats. The programme is being led by JNCC who co-ordinate the submission of data on the distribution of each habitat type within the territories of each Contracting Party (JNCC, 2008). OSPAR priority habitats are presented in Figure 4.7).

Figure 4.7: OSPAR priority habitats (JNCC, 2008)



4.2.3 The Habitats Directive

Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora, known as the Habitats Directive was adopted in 1992. The Directive is the means by which the European Union meets its obligations under the Bern Convention.

The main aim of the Habitats Directive is to promote the maintenance of biodiversity by requiring Member States to take measures to maintain or restore natural habitats and wild species listed on the Annexes to the Directive at a favourable conservation status, introducing robust protection for those habitats and species of European importance. In applying these measures Member States are required to take account of economic, social and cultural requirements, as well as regional and local characteristics.

The provisions of the Directive require Member States to introduce a range of measures, including (JNCC, 2010):

- Maintain or restore European protected habitats and species listed in the Annexes at a favourable conservation status as defined in Articles 1 and 2;

- Contribute to a coherent European ecological network of protected sites by designating Special Areas of Conservation (SACs) for habitats listed on Annex I and for species listed on Annex II. These measures are also to be applied to Special Protection Areas (SPAs) classified under Article 4 of the Birds Directive. Together SACs and SPAs make up the Natura 2000 network (Article 3);
- Ensure conservation measures are in place to appropriately manage SACs and ensure appropriate assessment of plans and projects likely to have a significant effect on the integrity of an SAC. Projects may still be permitted if there are no alternatives, and there are imperative reasons of overriding public interest. In such cases compensatory measures are necessary to ensure the overall coherence of the Natura 2000 network (Article 6);
- Member States shall also endeavour to encourage the management of features of the landscape that support the Natura 2000 network (Articles 3 and10);
- Undertake surveillance of habitats and species (Article 11),
- Ensure strict protection of species listed on Annex IV (Article 12 for animals and Article 13 for plants).
- Report on the implementation of the Directive every six years (Article 17), including assessment of the conservation status of species and habitats listed on the Annexes to the Directive.

The following regulations transpose the Habitats Directive to UK legislation:

- The Conservation (Natural Habitats, &c.) Regulations 1994 transposed the Habitats Directive into national law. The Regulations came into force on 30 October 1994, and have been subsequently amended several times. They apply to land and to territorial waters out to 12 nautical miles from the coast.
- The Conservation of Habitats and Species Regulations 2010 consolidate all the various amendments made to the 1994 Regulations in respect of England and Wales. In Scotland the Habitats Directive is transposed through a combination of the Habitats Regulations 2010 (in relation to reserved matters) and the 1994 Regulations.
- The Conservation (Natural Habitats, &c) Regulations (Northern Ireland) 1995 (as amended) transpose the Habitats Directive in relation to Northern Ireland.
- For UK offshore waters (ie from 12 nautical miles from the coast out to 200nm or to the limit of the UK Continental Shelf Designated Area), the Habitats Directive is transposed into UK law by the Offshore Marine Conservation (Natural Habitats & c.) Regulations 2007 (as amended).

4.3 Nature designations

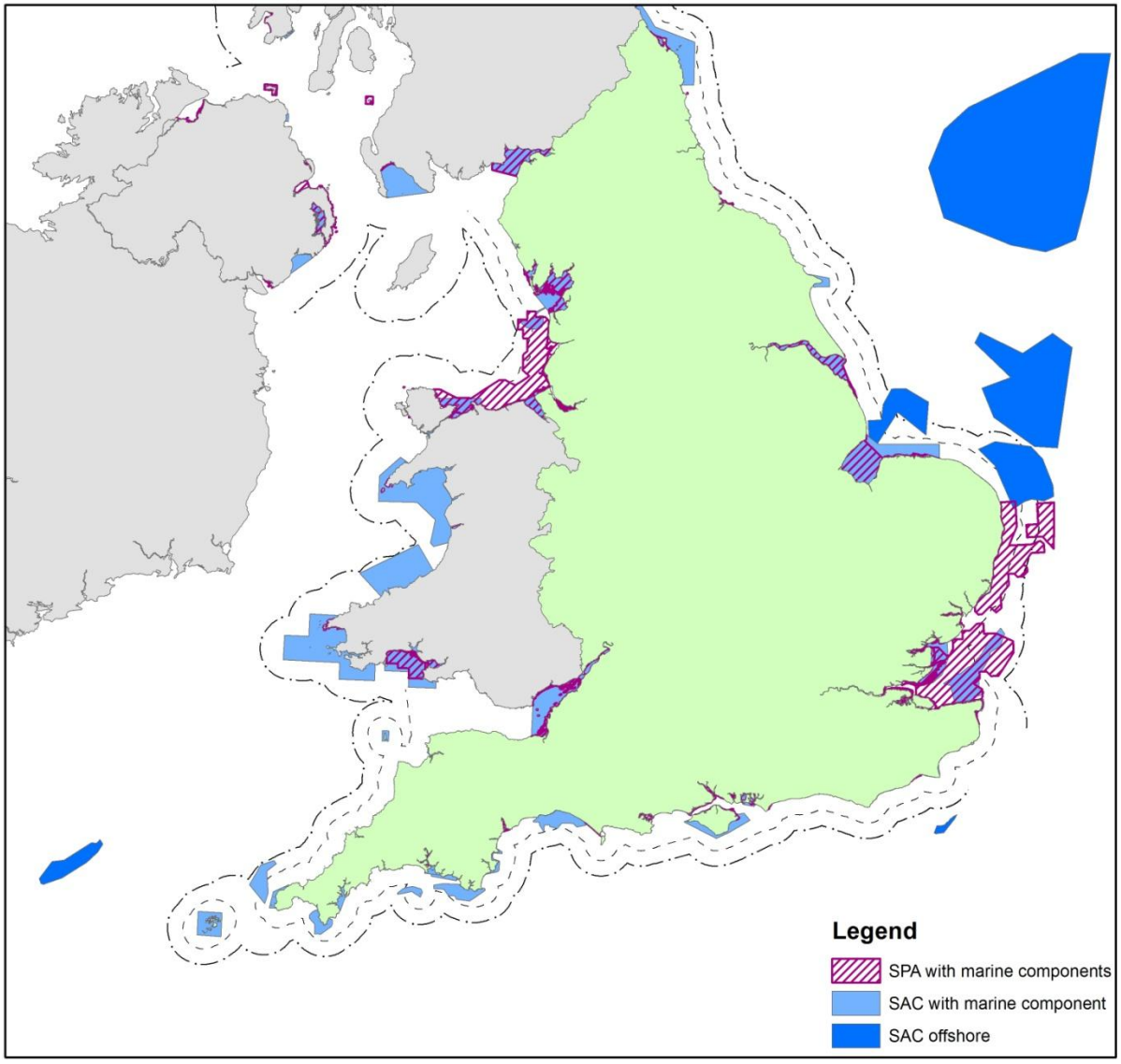
4.3.1 Special Areas of Conservation and Special Protection Areas

Under the Habitats Directive Special Areas of Conservation (SACs) have been designated within UK waters for the protection of certain habitats and species, and under the Birds Directive Special Protection Areas (SPAs) have been designated for the protection of certain wild bird species. SACs and SPAs with marine components are presented in Figure 4.8.

SACs with marine components are defined as those that contain qualifying marine habitats or species. There are currently 102 SACs with marine components, covering 5% of the UK sea area. 87 of these SACs are completely in inshore waters (classified as those within 12 nautical miles), 13 are completely in offshore waters and there are two sites which straddle inshore and offshore waters. On the land and in the sea out to 12 nautical miles the identification of SACs is the responsibility of the country conservation agencies. Beyond 12 nautical miles JNCC is responsible for the identification of SACs.

The UK currently has 107 SPAs with marine components, but only three of these are entirely marine. The Bae Caerfyrddin/ Carmarthen Bay SPA (Wales) was classified in 2003 for its non-breeding aggregations of common scoter. The Outer Thames Estuary and Liverpool Bay/Bae Lerpwl SPAs were classified in 2010 for their non-breeding aggregations of red-throated diver (both sites) and common scoter (Liverpool Bay/Bae Lerpwl SPA).

Figure 4.8: Special Areas of Conservation and Special Protection Areas within the UK EEZ



4.3.2 Marine Conservation Zones

The Marine and Coastal Access Act 2009 allows for the creation of a new type of Marine Protected Area (MPA), called a Marine Conservation Zone (MCZ). MCZs will protect a range of nationally important marine wildlife, habitats, geology and geomorphology and can be designated anywhere in English and Welsh inshore and UK offshore waters. Lundy Island in the Bristol Channel, a former Marine Nature Reserve, became the UK's first MCZ in January 2010.

The Statutory Nature Conservation Bodies (SNCBs – Natural England and JNCC) – are Defra's delivery partners for MCZs and set up four regional projects covering the South-West (Finding Sanctuary), Irish Sea (Irish Sea Conservation Zones), North Sea (Net Gain) and Eastern Channel (Balanced Seas) to deliver recommendations on potential MCZ sites.

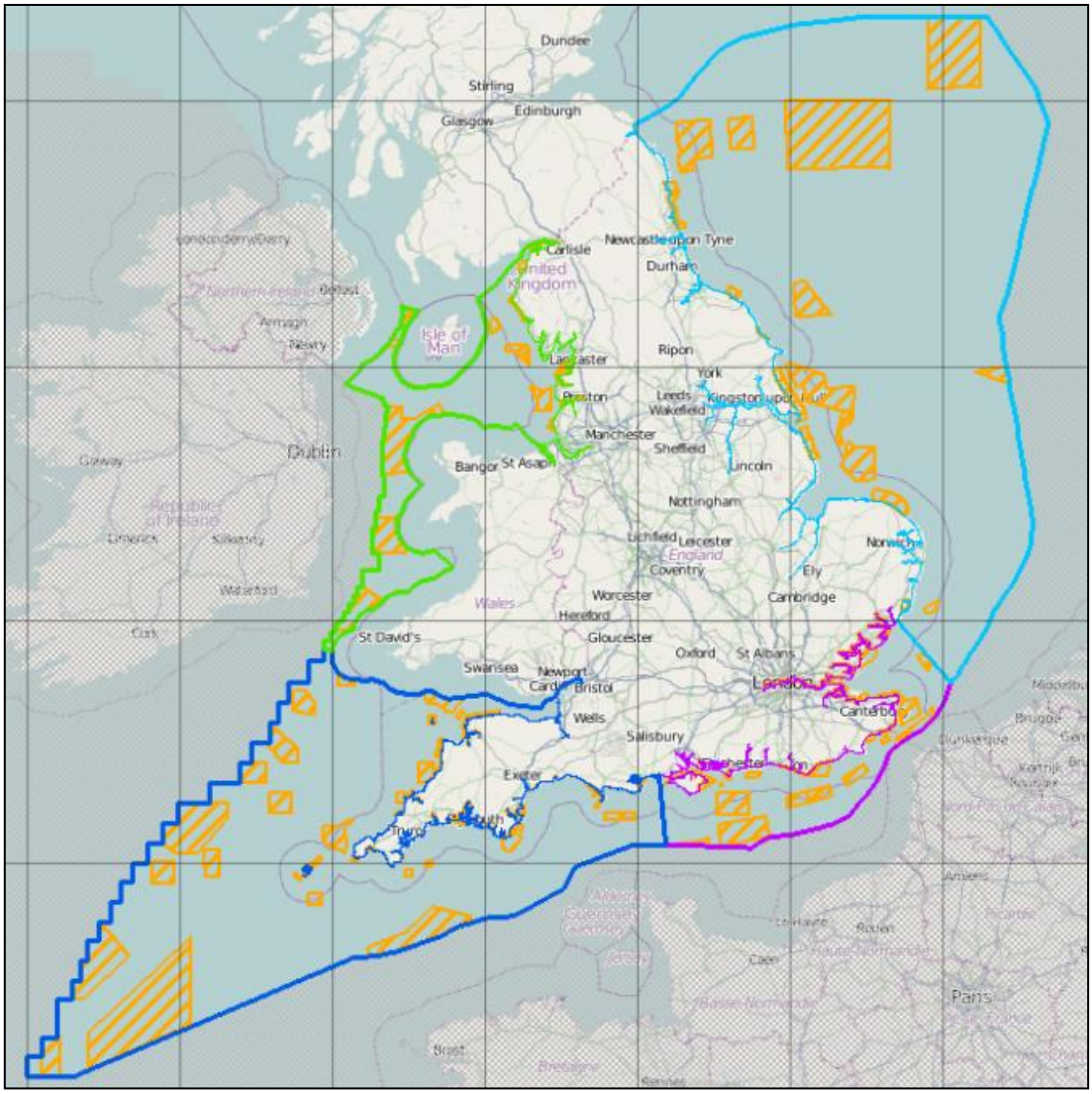
On 8 September 2011, the regional projects submitted their final recommendations to the SNCBs and the Science Advisory Panel for independent review (Figure 4.9). The final recommendations were reviewed by the Marine Protected Areas Science Advisory Panel, who submitted their formal advice to Government on 30 October 2011.

On the 15 November 2011, the Minister referred to the need for further work to be undertaken by Defra to strengthen the evidence base for some of the recommendations put forward by the regional projects. As a result of this, Natural England and the JNCC submitted their formal advice, including the Impact Assessment on all 127 recommended marine sites, to Defra on 18 July 2012.

Ministers will now examine the advice alongside the other evidence before them, before deciding which of the recommended sites should be among those candidates being considered for designation in the first tranche in summer 2013. These sites, and all the others recommended by the regional projects will be included in the public consultation that will be launched in December 2012.

Once a site has been designated as an MCZ by Defra, Natural England and the JNCC will provide advice to the appropriate regulators (MMO and IFCAs) advising them as to vulnerability of the features included within the designation order and activity that is currently occurring that will negatively impact on the conservation objectives of that site. The appropriate regulator will undertake a public consultation on appropriate management measures, and then implement them accordingly.

Figure 4.9: Marine Conservation Zones (MCZ, 2012)



5 Individual Inshore Fisheries and Conservation Authorities (IFCA) Reports

Individual reports for each IFCA are presented in this section. Each report includes:

- Details of the landings recorded from ICES rectangles that overlap the IFCA districts in relation to species and gear types;
- Surveillance data presented by gear type;
- VMS data for mobile vessels;
- Summary of identified fisheries; and
- List of information and data provided by the IFCA which will be reviewed during Stage 2.

Due to the scale of ICES rectangles the area they cover is often significantly larger than the IFCA district. Landings may therefore be over-represented or include species that may not be caught within 6 nautical miles. Care is therefore needed when interpreting the data and ground-truthing during IFCA site visits will be important to ensure the appropriate fisheries are included for each IFCA.

The summary of identified fisheries for each IFCA is based on species identified from 5-year landings statistics or known to be important based on information provided by IFCAs (where species are not represented within landings statistics e.g. hand collected cockles). The list of identified fisheries includes species taken as retained catch within targeted fisheries e.g. turbot retained from a sole and plaice targeted fishery.

It is intended that the list of identified fisheries will be further developed in consultation with IFCAs to establish key fisheries and any overlooked species, such as emerging fisheries that are not captured within the 2006-2010 data set or are in development.

It should be noted that the Sussex IFCA is not formally included within the scope of Project Inshore as a similar project was undertaken culminating in the Sussex Navigating the Future report (see http://www.sussex-sfc.gov.uk/UKIFSP.html for further details). As such Strategic Sustainability Reviews will not be undertaken for the Sussex IFCA. However, a brief Sussex IFCA report is included in this section to ensure presentation of a complete national picture for English inshore fisheries.

5.1 Cornwall

Figure 5.1: ICES rectangles overlapping IFCA

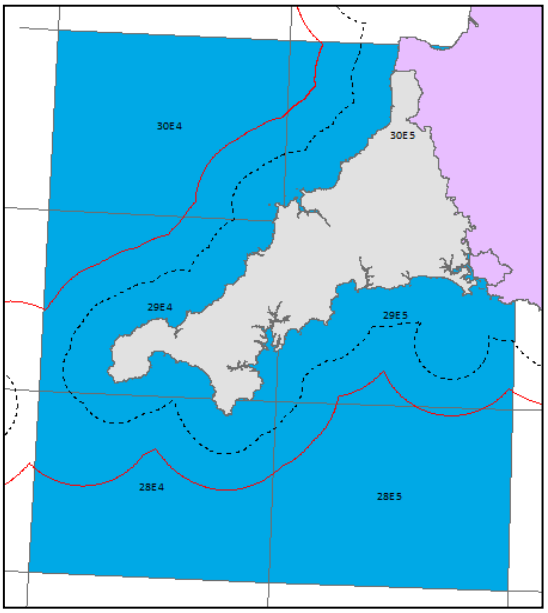
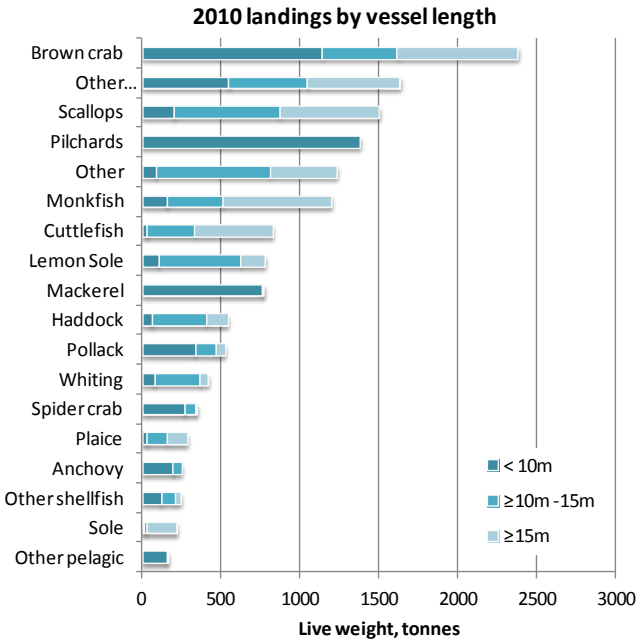


Figure 5.2: Landings by species and vessel length



The figures present landings from the ICES statistical rectangles that overlap the Cornwall IFCA district, as illustrated in Figure 5.1. Key species landed from this area include brown crab, scallops, pilchards, monkfish, cuttlefish, lemon sole and mackerel, as well as other demersal species.

Landings in 2010 were dominated by brown crab, with majority taken by under 10m vessels. Scallops are predominately targeted by vessels >10m, while pilchards are solely targeted by under 10m. Five year trends in landings value and weight by species are presented below.

Figure 5.3: Landings value (top) and weight (bottom) by species for 2006-2010 (MMO, 2012)

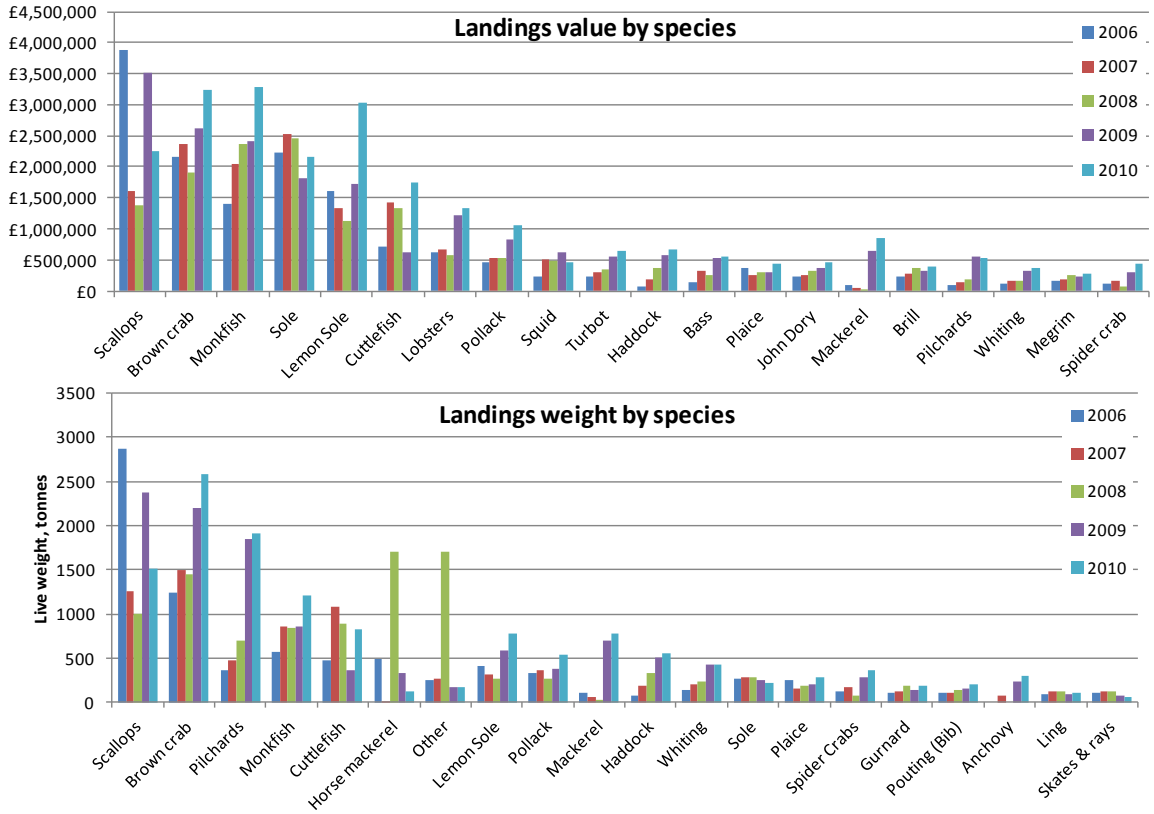
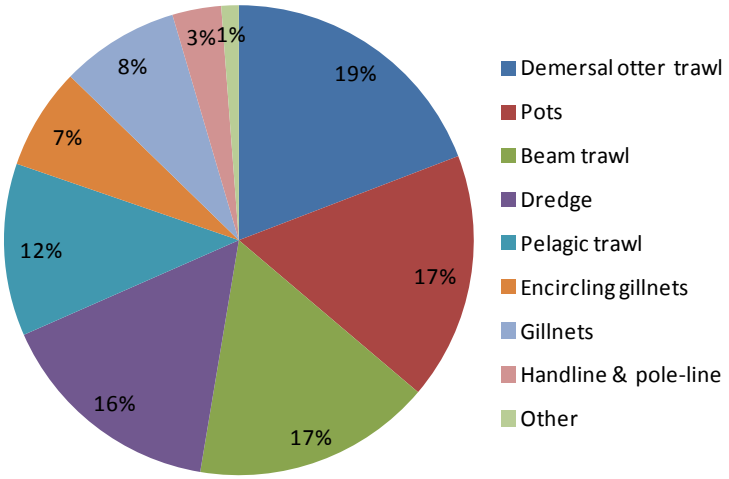


Figure 5.4: Landings by gear type



The figure to the left presents landings by weight (amalgamated from 2006-2010) to illustrate proportion of landings from Cornwall inshore ICES rectangles by gear type.

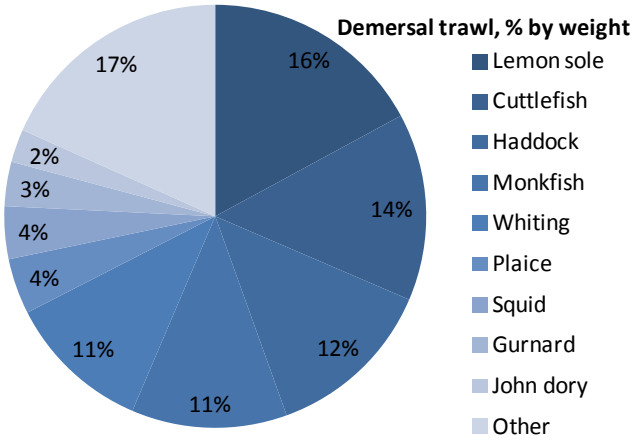
The figures below present species by gear type on the same basis.

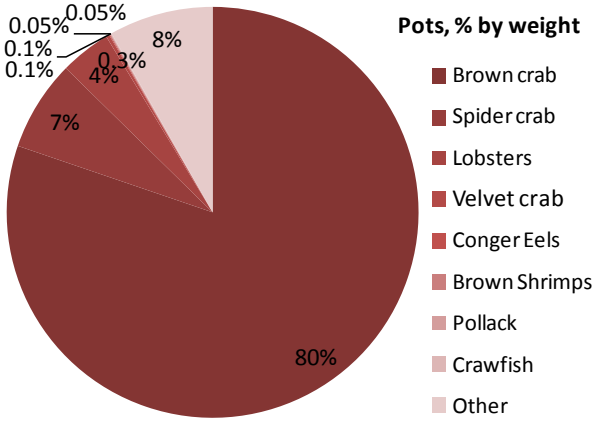
The highest proportion of landings is taken by demersal trawl where lemon sole, cuttlefish, haddock, monkfish and whiting make up the majority of the catch.

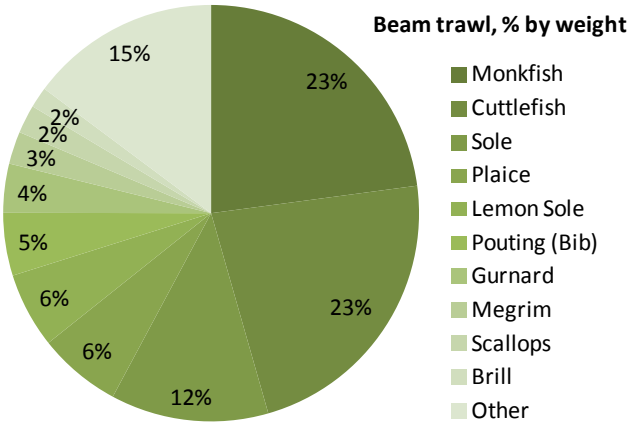
Monkfish and cuttlefish also form the majority of landings by beam trawl, which also take sole, plaice and lemon sole.

Landings by pots are dominated by brown crab and landings by dredge are dominated by scallops.

Figure 5.5: Landings for top four gears indicating proportion of species landed by weight







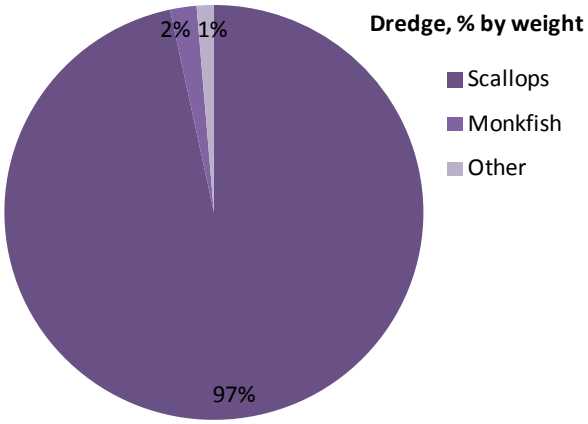


Figure 5.6: Surveillance data, 2007-2011 (MMO, 2012)

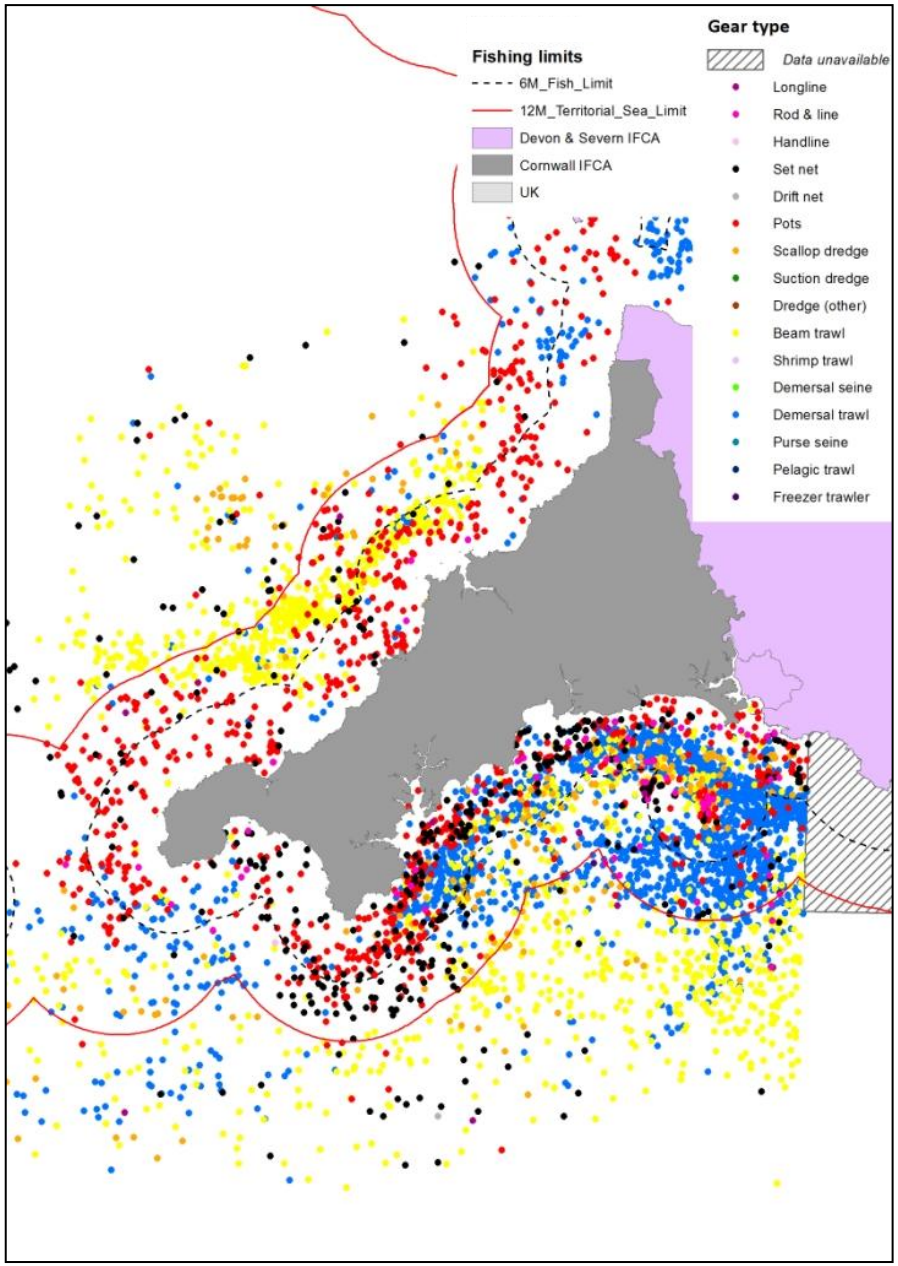
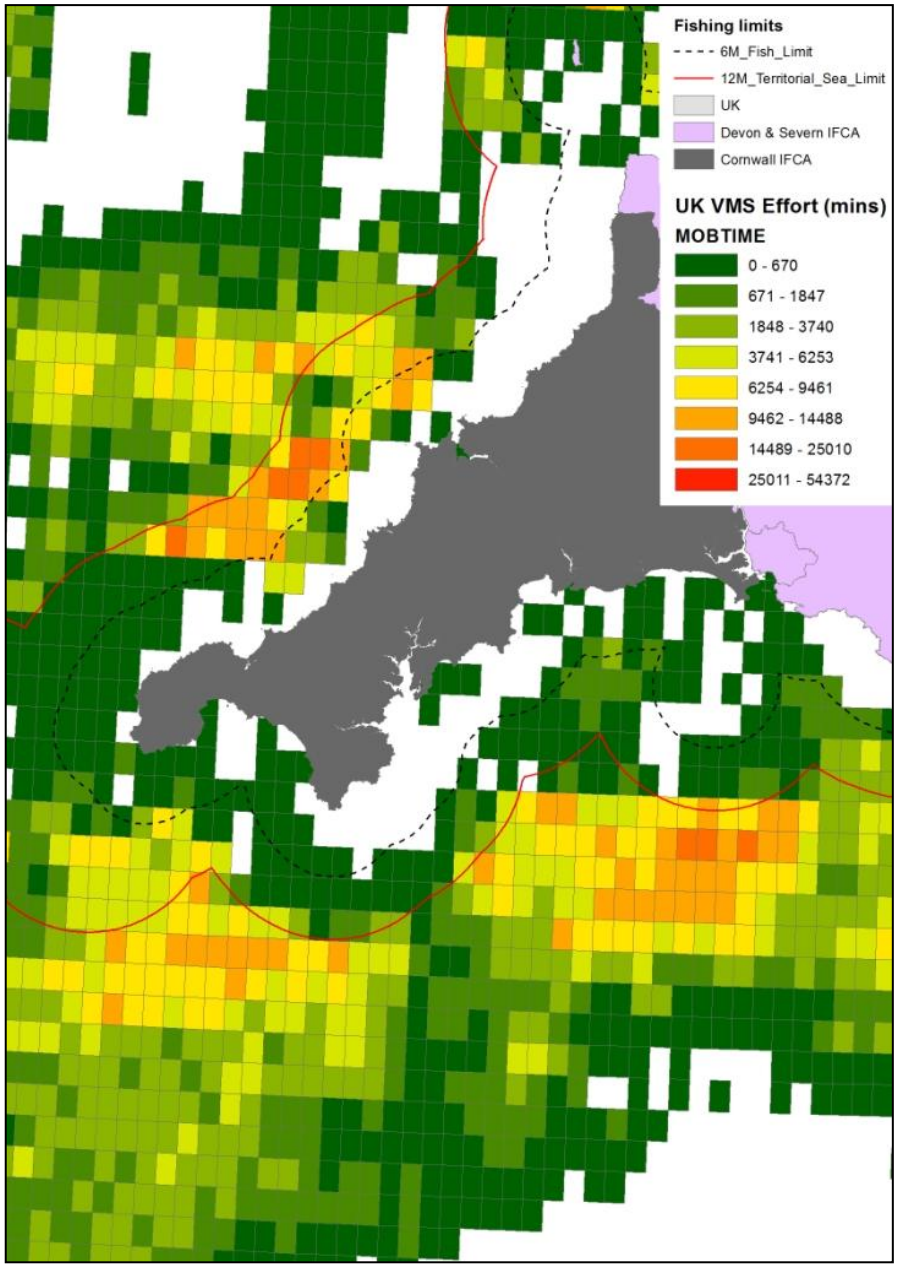


Figure 5.7: VMS effort for all UK mobile vessels ≥15m, 2010 (MMO, 2012)



5.1.1 Identified fisheries

Based on landings data for ICES rectangles that overlap the Cornwall IFCA district the fisheries outlined below are considered important for further assessment:

Finfish fisheries	Demersal trawl (TR1: >100mm)	Demersal trawl (TR2: 80-100mm)	Beam trawl	Dredge	Pelagic trawl	Gill net	Trammel net	Encircling net	Drift net	Handline and pole-line	Hooks & line
Demersal flatfish											
Brill	■	■	■	■		■	■				
Lemon sole	■	■	■								
Megrim	■		■			■					
Plaice	■	■	■			■	■				
Sole	■	■	■	■		■	■		■		
Turbot	■	■	■	■		■	■				
Demersal round fish											
Bass	■		■		■	■	■		■	■	■
Haddock	■	■	■			■					
John dory	■		■			■					
Monkfish	■	■	■	■		■					
Red mullet	■	■	■			■					
Pollack	■		■			■				■	■
Whiting	■	■	■			■					
Pelagic fish											
Mackerel					■	■				■	■
Pilchard						■		■	■	■	

Shellfish fisheries	Mechanised dredge	Creel	Trap	Hand collection	Demersal trawl	Beam trawl	Gill net
Scallop	■			■	■	■	
Cuttlefish		■	■		■	■	■
Squid					■	■	
Brown crab		■				■	■
Spider crab		■					■
Lobster		■					■

5.1.2 Information and reports

The following information and reports have been collated from the Cornwall IFCA, sorted based on relevance to each MSC Principle:

Principle 1:

- Cornish Inshore Waters Shellfish Stock Survey 2003-2006
- A short investigation into size frequency distribution of spider crab *Maia squinado* within the CSFC District, 2008
- Annual Research Report including Lobster Tagging Final Report, 2009
- Lobster Tagging Interim Report 2008
- Spider Crab Regulatory Impact Assessment 2009

Principle 2:

- Red Mullet Netting – Code of Practice
- Code of Practice for Incidental Capture of Cetacean Bycatch
- Seaquest Netsafe project reports on inshore pinger use (not yet received)

Principle 3:

- Byelaws
- Cornwall IFCAs Enforcement Strategy
- Cornwall IFCA 2012/2013 Risk Based Enforcement Plan
- Cornwall IFCA Financial Administrative Penalty Guidance Document
- Cornwall IFCA Annual Budget 2012-2013
- Cornwall IFCA Constitution

General:

- Shellfish returns data (2007-2011) (not yet received)
- Cornish IFCA port survey, 2009
- Pre-assessments for edible crab, lobster and spider crab (not yet received)

5.2 Devon and Severn

Figure 5.8: ICES rectangles overlapping IFCA

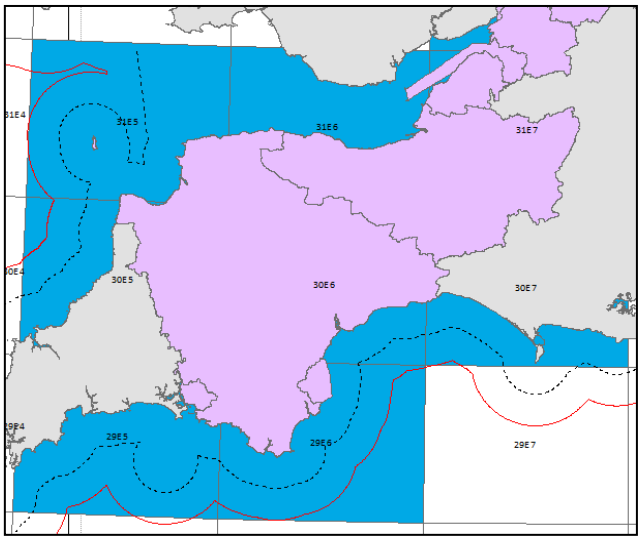
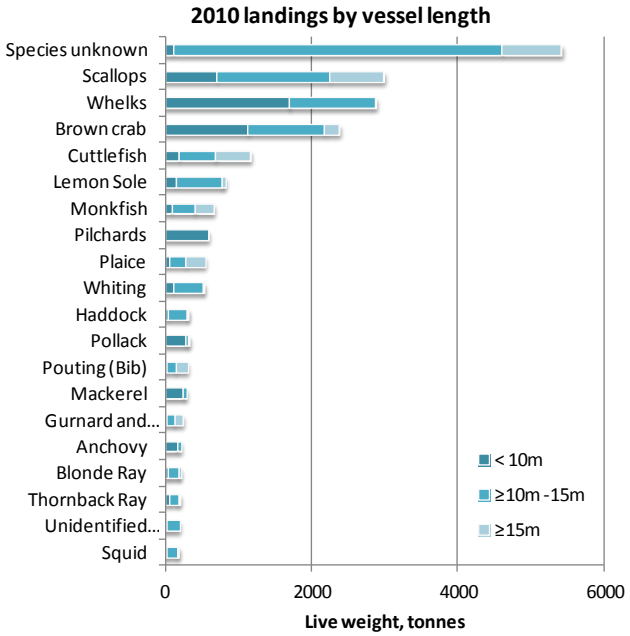


Figure 5.9: Landings by species and vessel length



The figures present landings from the ICES statistical rectangles that overlap the Devon and Severn IFCA district, as illustrated in Figure 5.8. Key species landed from this area include scallops, sole, brown crab, lemon sole, cuttlefish, monkfish, squid and bass. A whelk fishery has grown since 2008 with significant landings in 2010.

The majority of landings are taken by under 15m vessels, although some vessels over 15m in length target scallops (dredgers) and cuttlefish (demersal trawlers) which is illustrated within VMS data.

Figure 5.10: Landings value (top) and weight (bottom) by species for 2006-2010 (MMO, 2012)

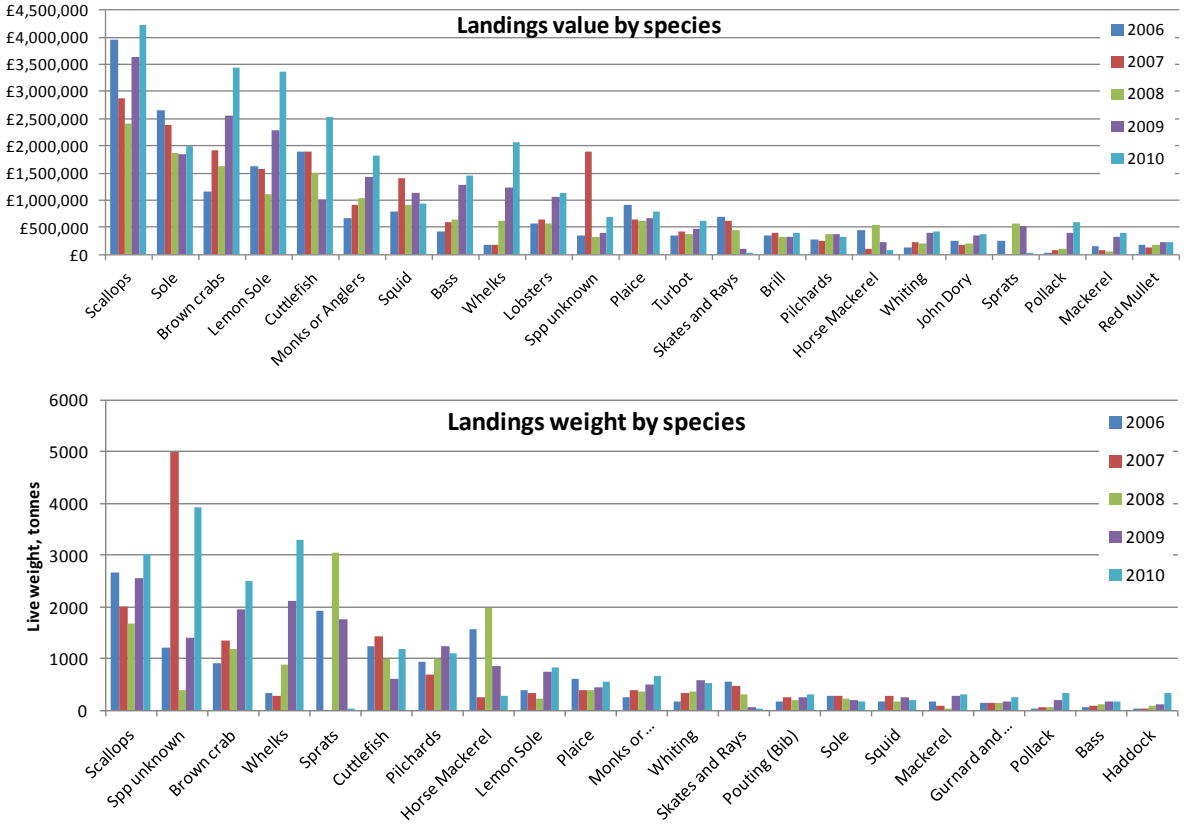
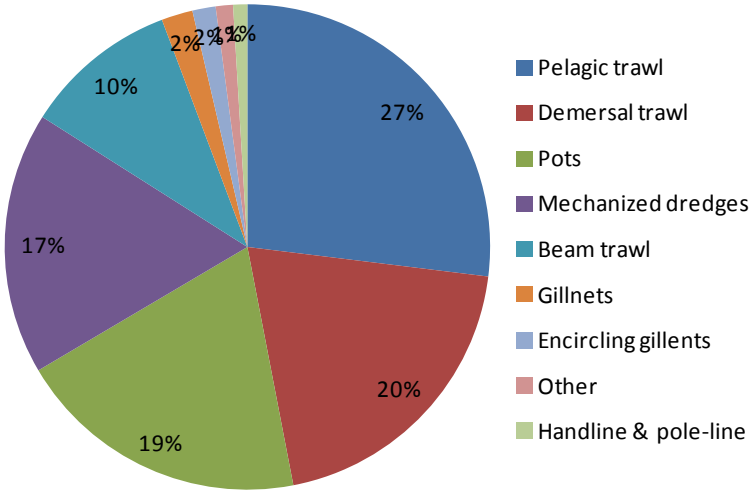


Figure 5.11: Landings by gear type



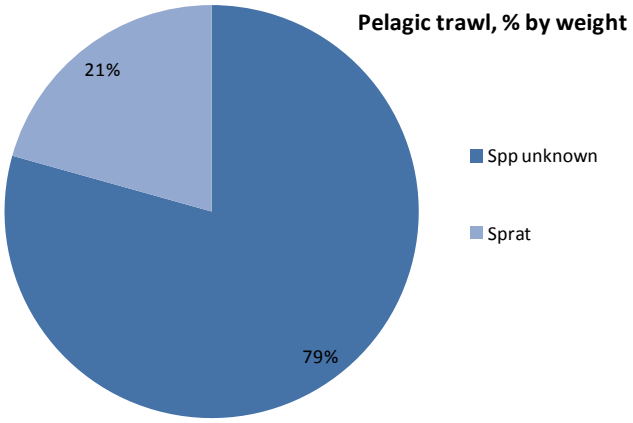
The figure to the left presents landings by weight (amalgamated from 2006-2010) to illustrate proportion of landings from Devon and Severn inshore ICES rectangles by gear type. The figures below present species by gear type on the same basis.

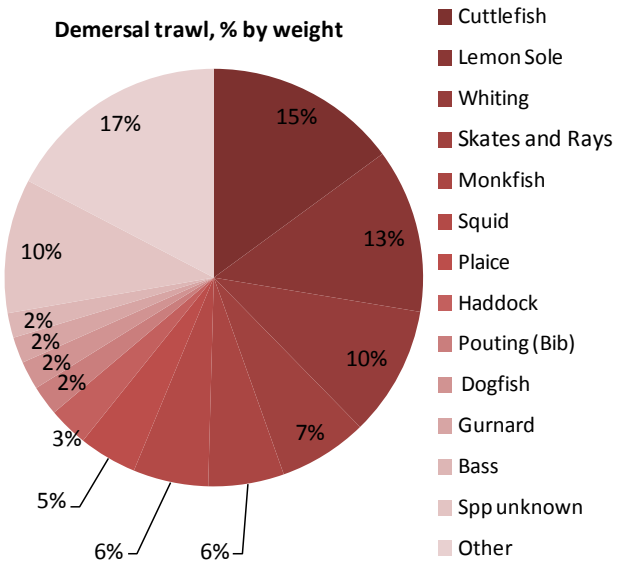
Across this five year period the highest proportion of landings by weight was taken by pelagic trawl where sprat dominated the catch. Data recorded under 'spp unknown' in 2008 is likely to be sprat.

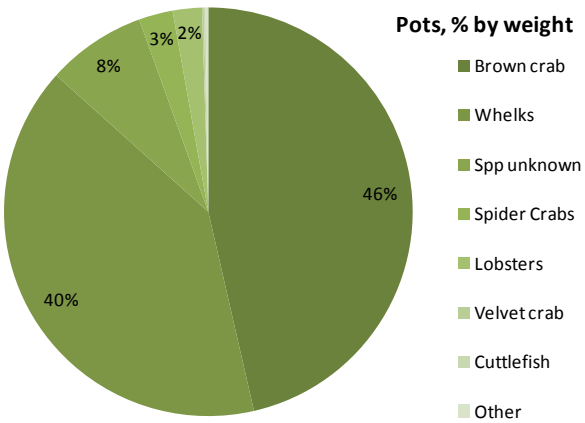
Demersal trawl is an important gear in this IFCA district targeting a range of species including cuttlefish, lemon sole, whiting, skates & rays, monkfish and squid.

Landings by pots are dominated by brown crab and whelk, and landings by dredge are dominated by scallops.

Figure 5.12: Landings for top four gears indicating proportion of species landed by weight







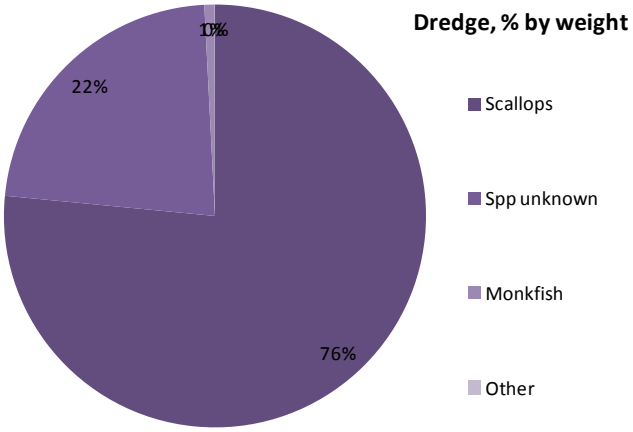


Figure 5.13: Surveillance data, 2007-2011 (MMO, 2012)

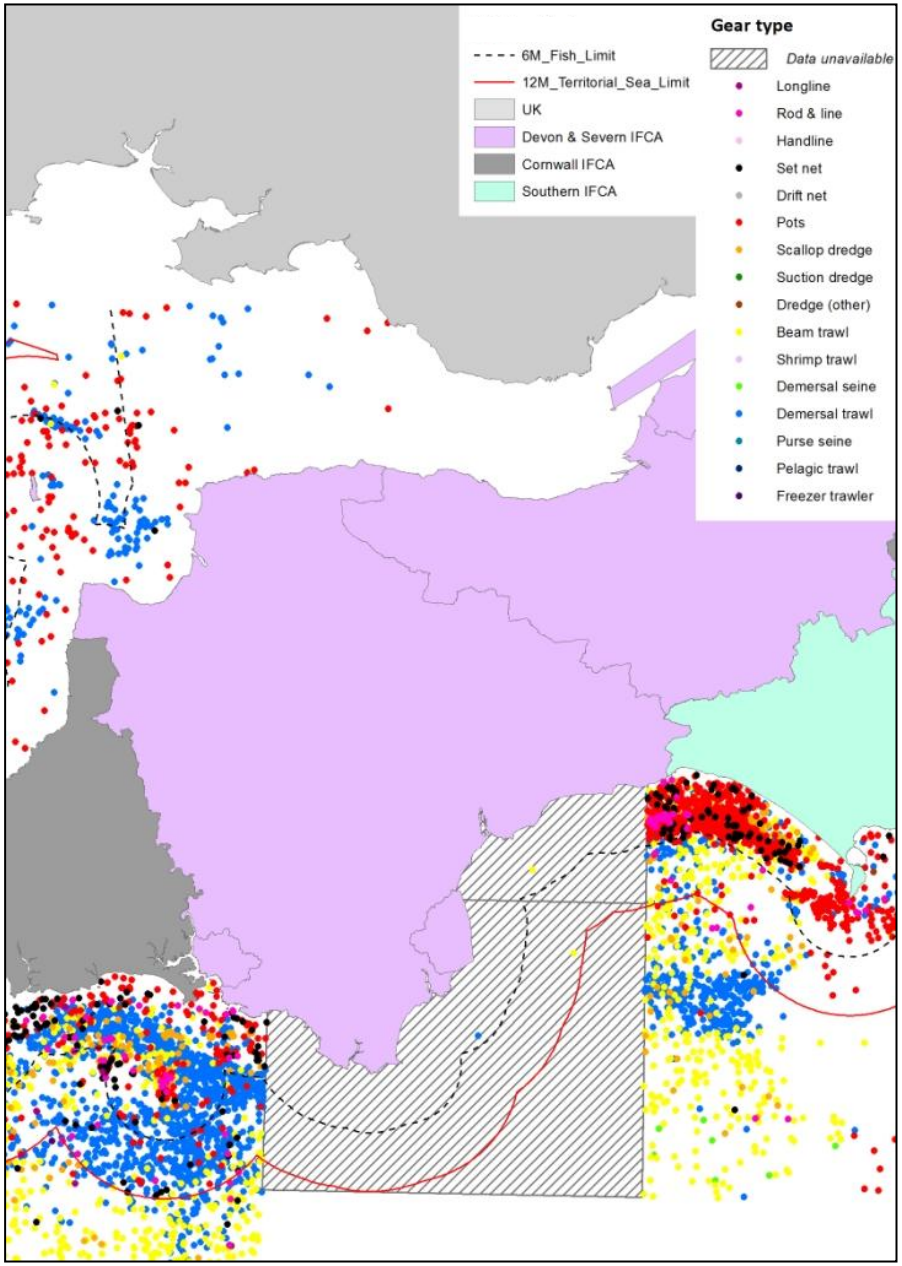
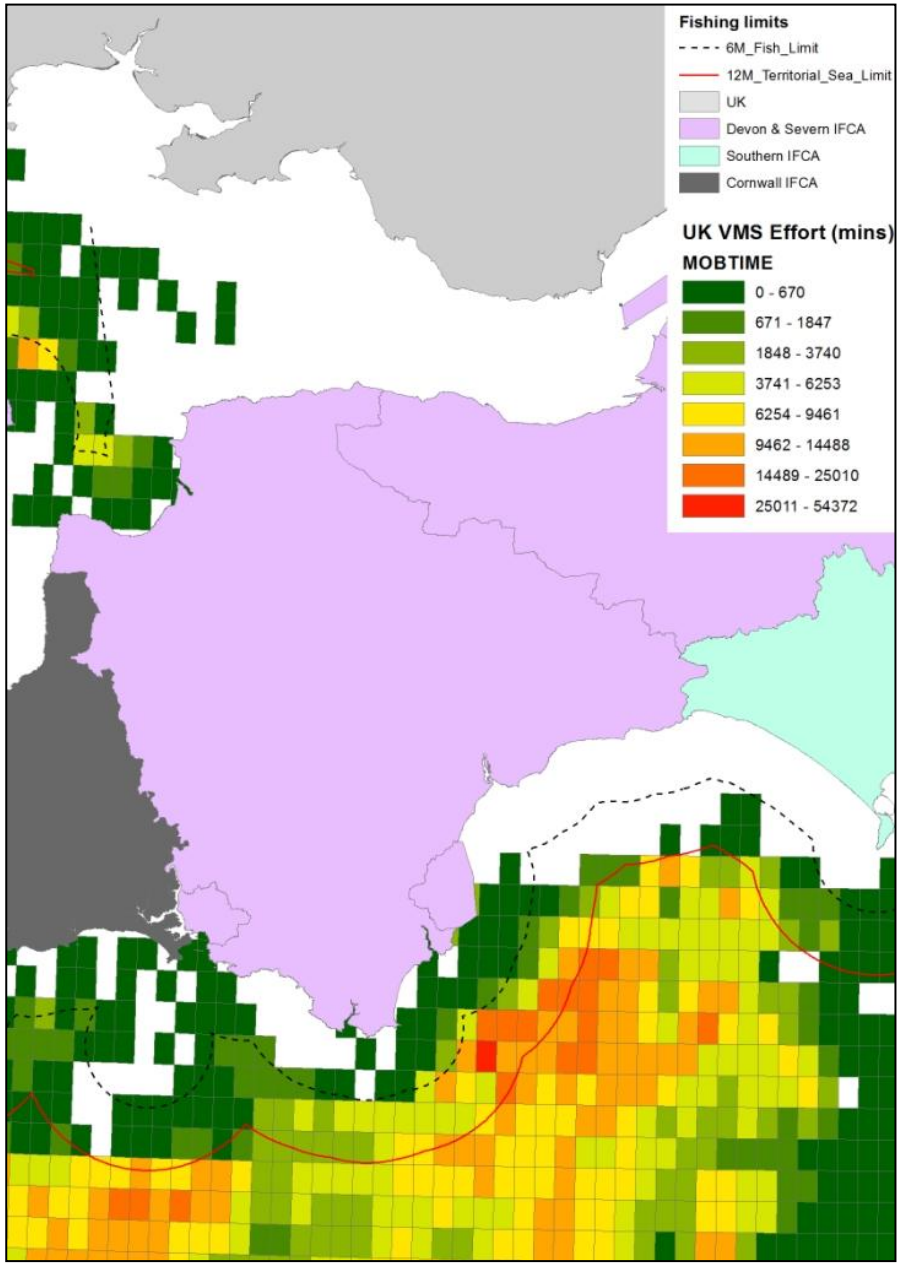


Figure 5.14: VMS effort for all UK mobile vessels ≥15m, 2010 (MMO, 2012)



5.2.1 Identified fisheries

Based on landings data for ICES rectangles that overlap the Devon and Severn IFCA district the fisheries outlined below are considered important for further assessment:

Finfish fisheries	Demersal trawl (TR1: >100mm)	Demersal trawl (TR2: 80-100mm)	Beam trawl	Dredge	Pelagic trawl	Gill net	Trammel net	Drift net	Long line	Handline and pole-line	Hooks & line
Demersal flatfish											
Lemon sole	■	■	■								
Plaice	■	■	■			■	■				
Sole	■	■	■	■		■	■	■			
Turbot	■	■	■	■		■	■				
Demersal round fish											
Bass	■		■		■	■	■	■		■	■
Gurnard	■	■	■			■					
Haddock	■	■	■			■					
John dory	■		■			■					
Monkfish	■	■	■	■		■					
Red mullet	■	■	■			■					
Elasmobranch											
Blonde ray	■		■			■			■		
Thornback ray	■	■	■			■	■	■	■		
Pelagic fish											
Mackerel					■	■				■	■
Sprat					■						

Shellfish fisheries	Mechanised dredge	Creel	Whelk pot	Trap	Hand collection	Demersal trawl	Beam trawl	Gill net
Scallop	■				■	■	■	
Cuttlefish		■		■		■	■	■
Squid						■	■	
Brown crab		■					■	■
Lobster		■						■
Whelk			■					
Periwinkle					■			

5.2.2 Information and reports

The following information and reports have been received from the Devon and Severn IFCA, sorted based on relevance to each MSC Principle:

Principle 1:

- Local stock assessments as follows: Taw Torridge mussels, Teign Mussels (in progress), Exe Cockles (raw data only), Salcombe Scallop fishery Landings (Permitted by D&S IFCA), Lundy landings, SAC Lundy population data, Potting effort reports, Lug worm (in progress), Crab tiling effort (in progress for 2012 - old reports provided), Waddeton Order shellfish returns. Teign cockles
- Whelk Size at Sexual Maturity research started July.
- Comparison of lobster weight & carapace length to inform possible maximum size byelaw.
- Sea Angling Survey 2012.
- Bait Digging survey 2012.
- Devon's Shellfish beds Report.
- Distrubution of Crepidula fornicata in district.

Principle 2:

- Report on *the effects of an eco-elevator cockle harvester on macrofauna assemblage, cockle populations and sediment parameters within an intertidal sand flat*.
- Report on Exe Estuary Site of Special Scientific Interest
- Underwater filming of reef features in Lyme Bay & Torbay SAC to map extent and increase evidence
- Currently assisting the RSPB with a review on whether netting impacts on seabirds.
- Marine mammal sightings not recorded in house but may feed into the Wise Scheme.
- Devon Biodiversity Action Plan

Principle 3:

- Byelaws
- Local fishery management plans as follows:
    - Lyme Bay SI (MMO Licence variation),
    - SACs (MMO Licence variation).
    - Voluntary agreements for limiting Crab tiling on estuaries.
    - Voluntary agreement on fishing near eel grass beds Torbay.
    - All estuaries have management plans with chapters outlining fisheries management - Plymouth Sound Estauries; Exe Estaury, Teign Estaury , AONB estuaries (Avon, Yealm, Dart).
    - Waddeton Regulating Order held by D&S IFCA.
    - Teign Regulating Order.
- Quarterly enforcement and inspection report (May 2012)
- Devon and Severn IFCA Annual Plan for 2012 - 2013.
- Devon and Severn IFCA Enforcement Plan for 2012 – 2013
- Devon and Severn IFCA Research Plan for 2012 – 2013

- Authority's guidance on Fixed Administrative Penalties
- Authority's Enforcement and Compliance Strategy

General:

- Landings of cuttlefish into Brixham 1988-2011
- MSC accreditation for mussels on the Exe

5.3 Eastern

Figure 5.15: ICES rectangles overlapping IFCA

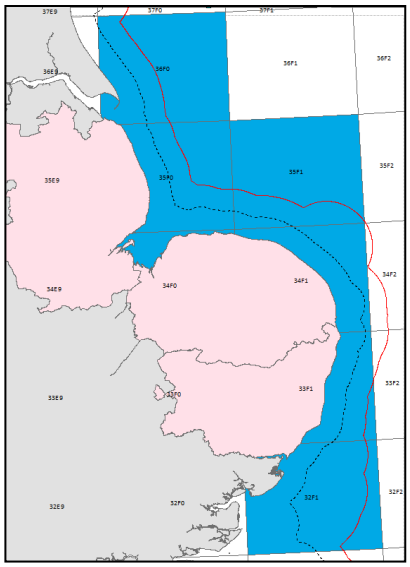
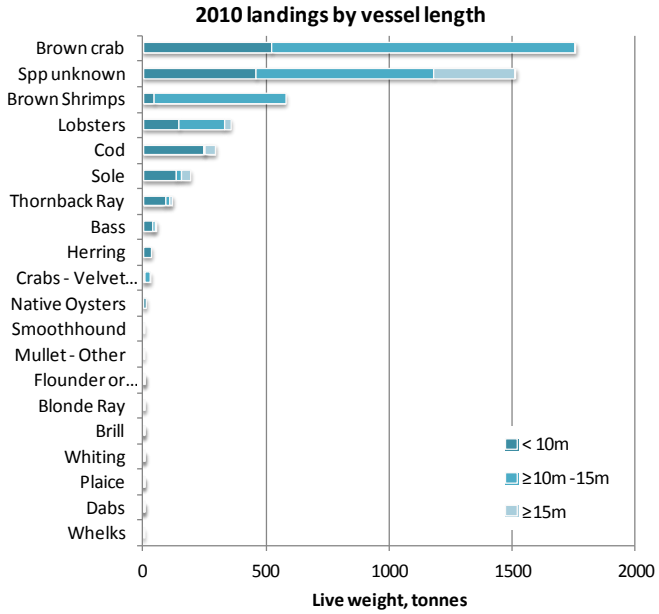


Figure 5.16: Landings by species and vessel length



The figures present landings from the ICES statistical rectangles that overlap the Eastern IFCA district, as illustrated in Figure 5.15. Key species landed from this area include lobster, brown crab, brown shrimp, sole, cod and thornback ray. Landings from regulating and several orders (therefore including the significant cockle and mussel Wash fishery) are not reflected in this MMO derived data.

Landings by weight in 2010 were dominated by brown crab, with the majority taken by 10-15m vessels, and the remainder (approximately a third) by under 10m vessels. Brown shrimps are also targeted by vessels 10-15m in length.

Figure 5.17: Landings value (top) and weight (bottom) by species for 2006-2010 (MMO, 2012)

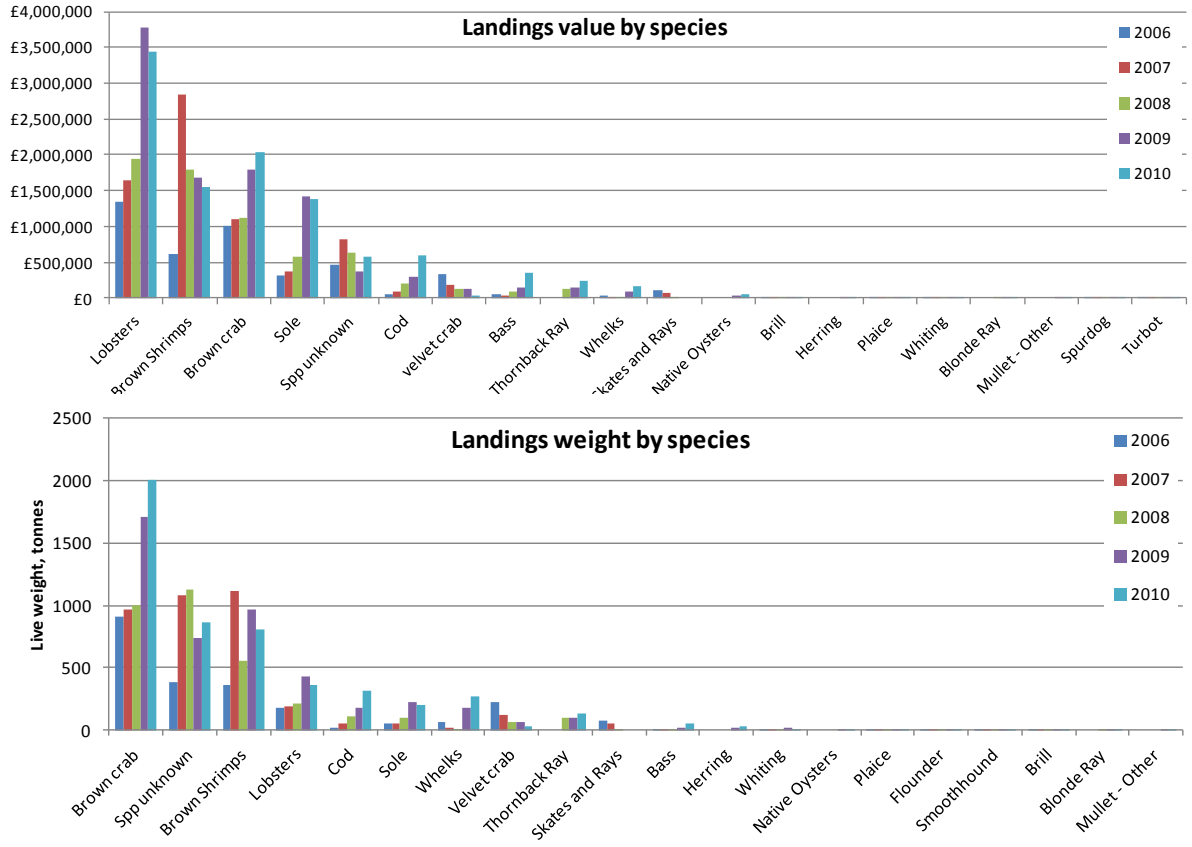
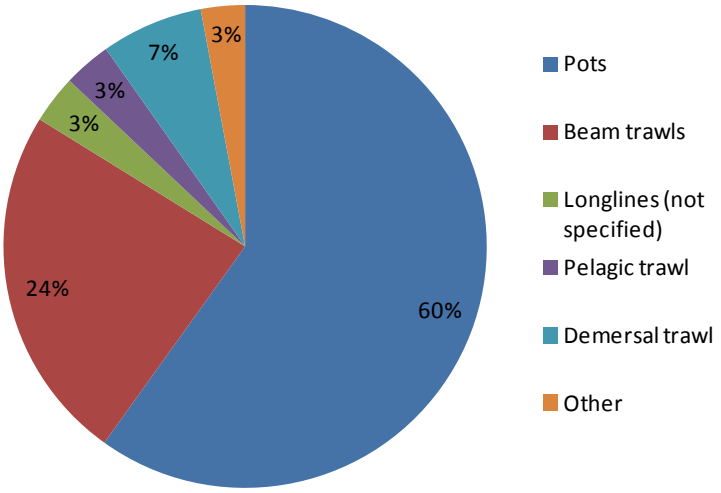


Figure 5.18: Landings by gear type



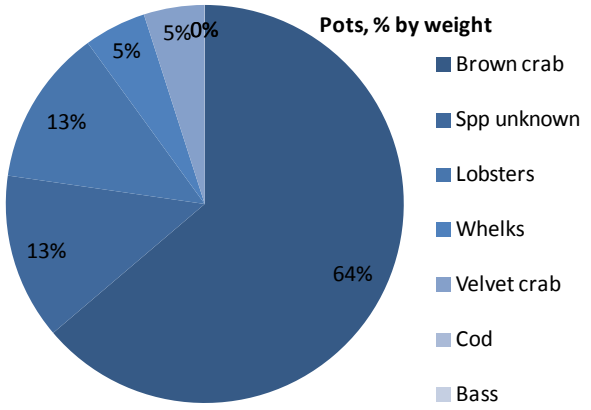
The figure to the left presents landings by weight (amalgamated from 2006-2010) to illustrate proportion of landings from the Eastern IFCA inshore ICES rectangles by gear type. The figures below present species by gear type on the same basis.

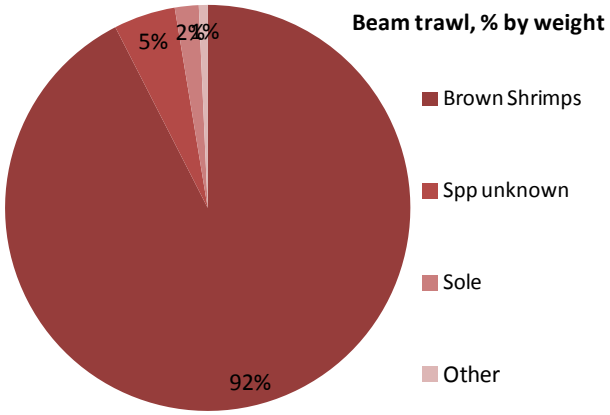
The highest proportion of landings is taken by pots where brown crab, lobster and whelk make up the majority of the catch, with small amounts of velvet crab, cod and bass also taken.

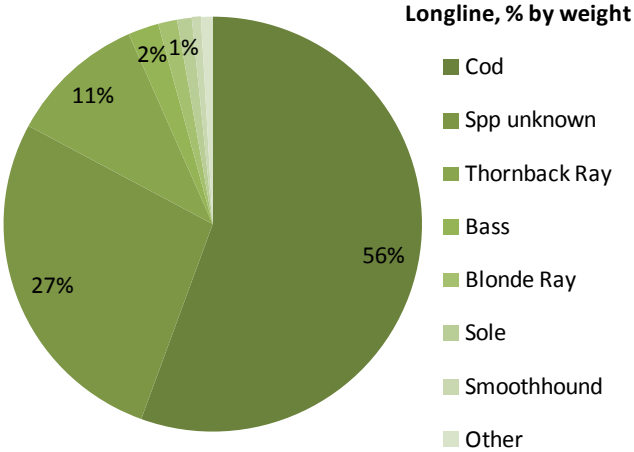
Beam trawl vessels predominately target brown shrimp and longline vessels target cod, although thornback ray and bass are also taken.

Approximately a third of landings by weight taken by demersal trawl are sole, with thornback ray, cod and other ray species forming important retained species within the catch.

Figure 5.19:Landings for top four gears indicating proportion of species landed by weight







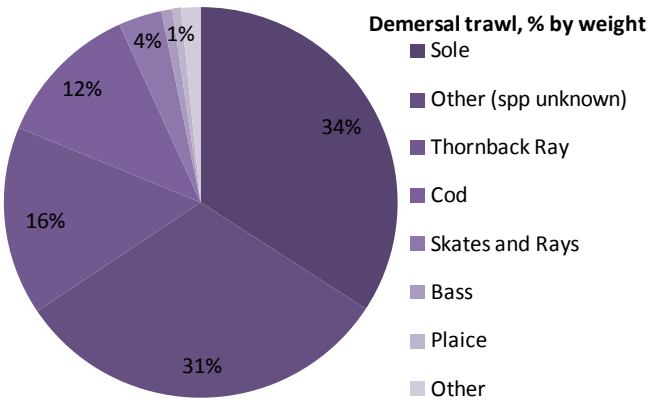


Figure 5.20: Surveillance data, 2007-2011 (MMO, 2012)

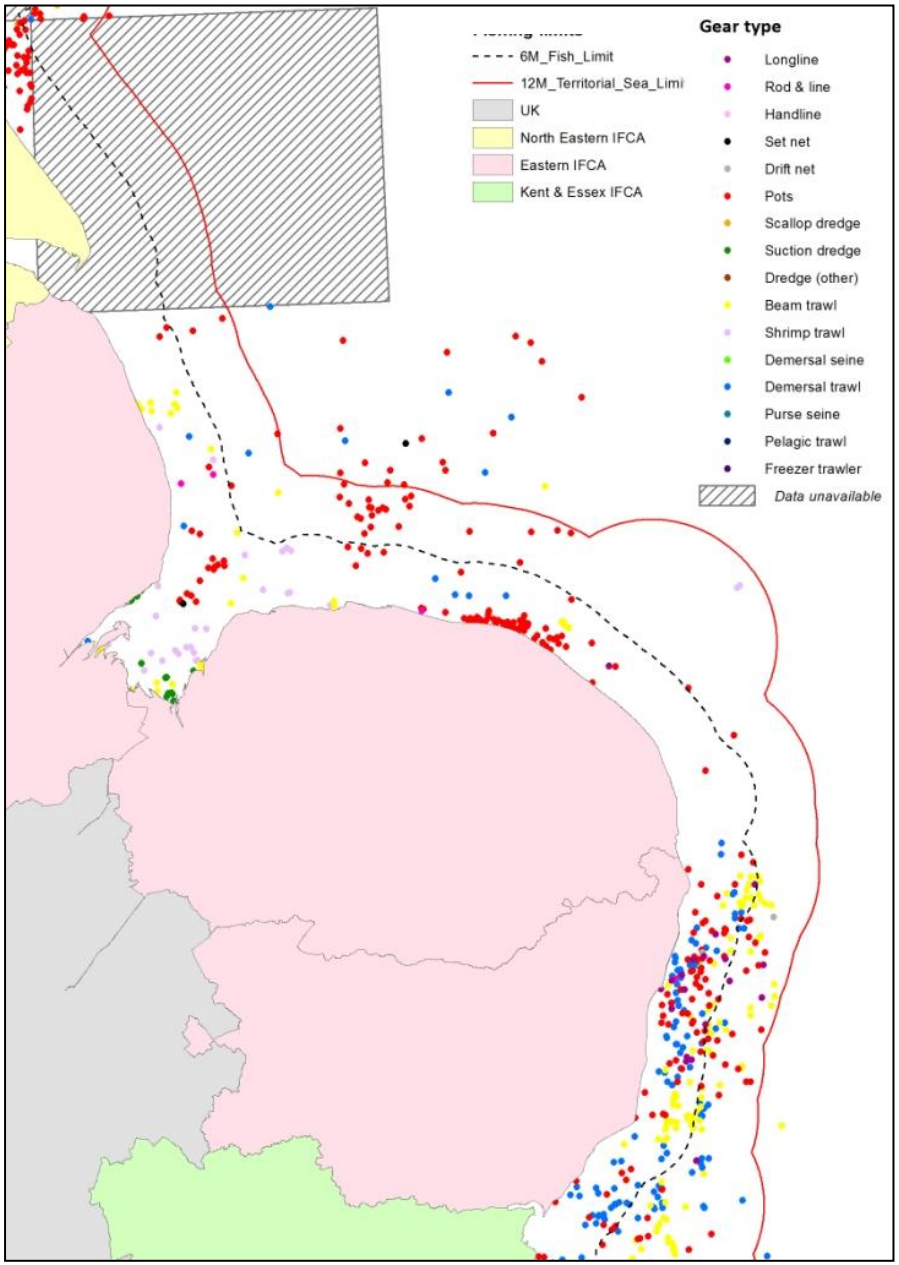
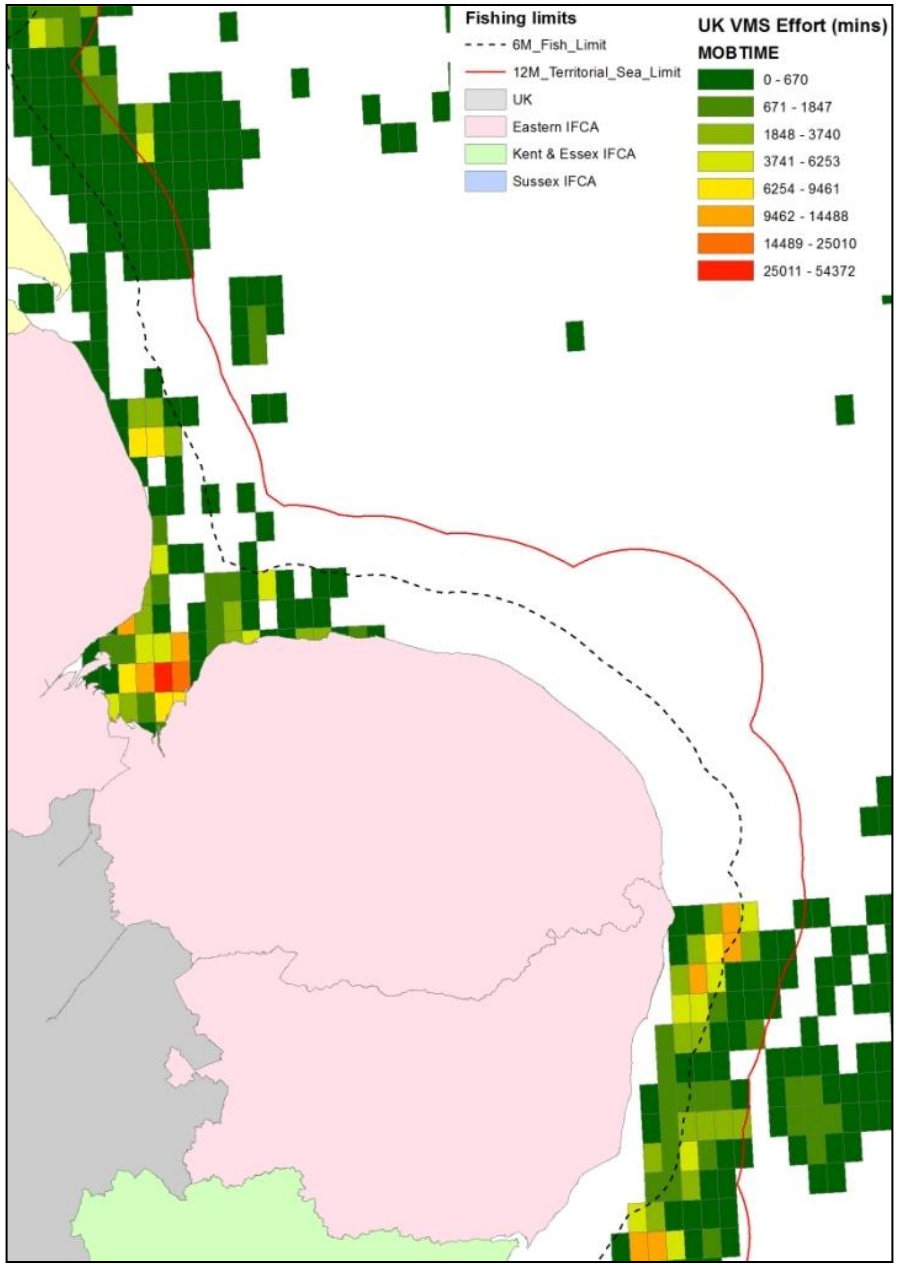


Figure 5.21: VMS effort for all UK mobile vessels ≥15m, 2010 (MMO, 2012)



5.3.1 Identified fisheries

Based on landings data for ICES rectangles that overlap the Eastern IFCA district the fisheries outlined below are considered important for further assessment:

Finfish fisheries	Demersal trawl (TR1: >100mm)	Demersal trawl (TR2: 80-100mm)	Beam trawl	Gill net	Trammel net	Drift net	Long line	Handline and pole-line	Hooks & line
Sole									
Plaice									
Bass									
Cod									
Thornback ray									

Shellfish fisheries	Mechanised dredge	Creel	Whelk pot	Hand collection	Beam trawl	Gill net
Cockle						
Native oyster						
Brown crab						
Velvet crab						
Lobster						
Brown shrimp						
Whelk						
Mussel						

5.3.2 Information and reports

The following information and reports have been received from the Eastern IFCA, sorted based on relevance to each MSC Principle:

Principle 1:

- Appropriate Assessment for cockle fishery, 2012

Principle 2:

- Research and Environment Plan 2012-2013
- Report on reducing shrimp discards using letterbox method
- Closed areas for cockle fishery, 2012
- Appropriate Assessment for cockle fishery, 2012

Principle 3:

- Eastern IFCA Byelaws
- Eastern IFCA Annual Plan, 2012-2013
- Eastern IFCA Enforcement Strategy, 2012
- Eastern IFCA Penalties for fisheries offences
- List of recent successful prosecutions
- The Wash Fishery Order, 1992
- Eastern IFCA Research and Environment Plan 2012-2013
- Eastern IFCA Annual Report 2011-2012
- Eastern IFCA Research Reports 2010 and 2011
- Cockle Code of Best Practice

General:

- Shrimp MSC pre-assessment, 2011
- Shellfish Returns

5.4 Isles of Scilly

Figure 5.22: ICES rectangles overlapping IFCA

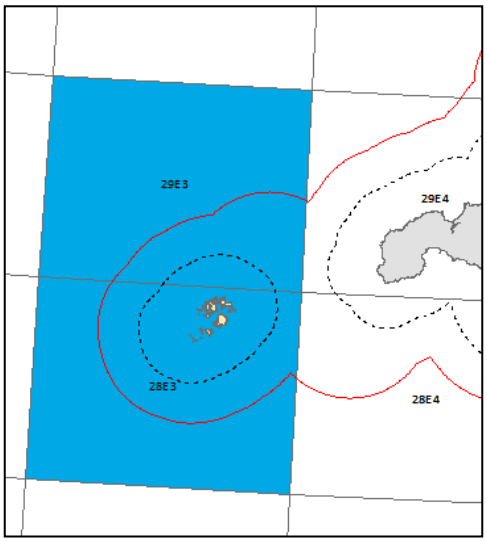
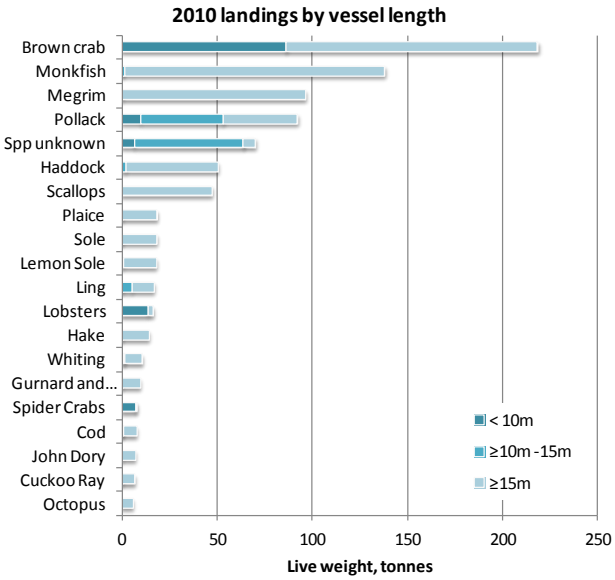


Figure 5.23: Landings by species and vessel length



The figures present landings from the ICES statistical rectangles that overlap the Isles of Scilly IFCA district, as illustrated in Figure 5.22. It should be noted that a relatively large amount of this area is outside of the 6 mile limit, therefore the landing statistics reflect this, and include some significant fisheries, not thought to occur within the 6nm limit. Key species landed from this area include brown crab, monkfish, sole, scallops, megrim, Pollack and haddock.

Much of the catch across these ICES rectangles is taken by vessels >15m in length which are likely to be operating outside the IFCA boundary area. Key fisheries within the IFCA district are likely to include potting for brown crab, lobster and spider crabs, and gill netting for Pollack.

Figure 5.24: Landings value (top) and weight (bottom) by species for 2006-2010 (MMO, 2012)

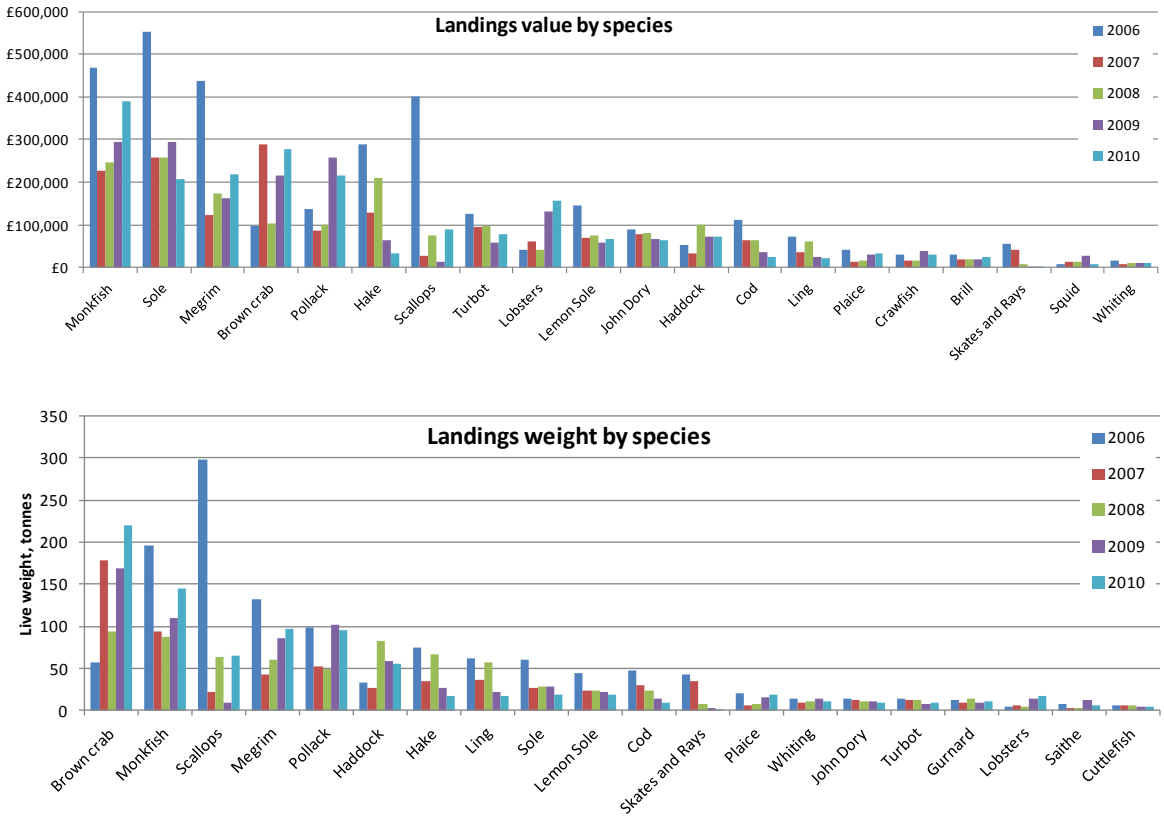
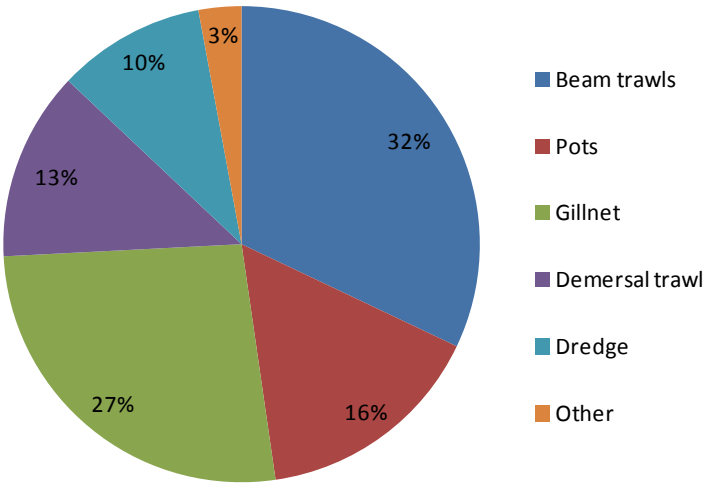


Figure 5.25: Landings by gear type



The figure to the left presents landings by weight (amalgamated from 2006-2010) to illustrate proportion of landings from Isles of Scilly inshore ICES rectangles by gear type. The figures below present species by gear type on the same basis.

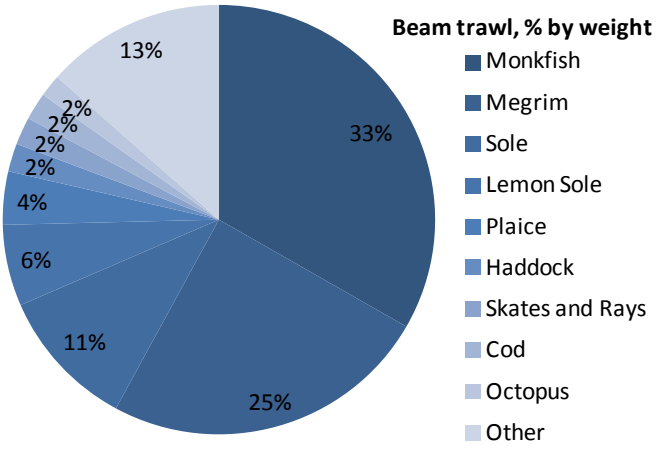
The highest proportion of landings is taken by beam trawl where monkfish, megrim, sole and lemon sole make up the majority of the catch (although these are likely to be outside the IFCA district).

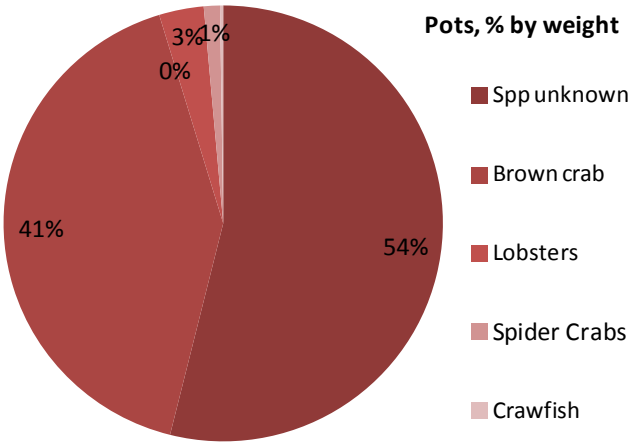
The potting fleet target brown crab, lobster and spider crab, with a small proportion of crawfish also taken.

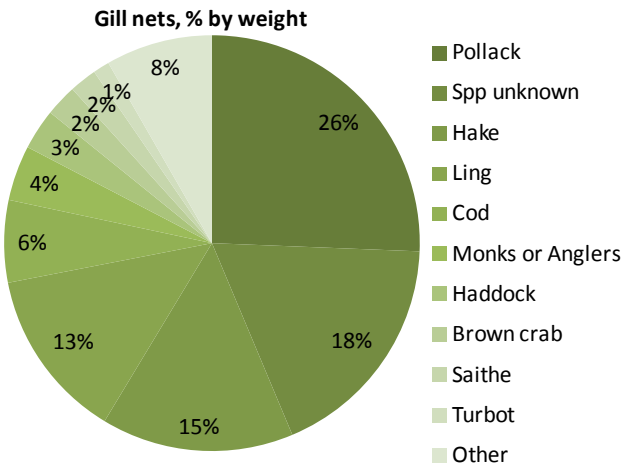
Pollack make up a quarter of landings by gill nets, which also take hake, ling, cod, monkfish and haddock.

A mixed demersal trawl fleet targets haddock, monkfish, megrim, John dory, lemon sole and other demersal species.

Figure 5.26: Landings for top four gears indicating proportion of species landed by weight







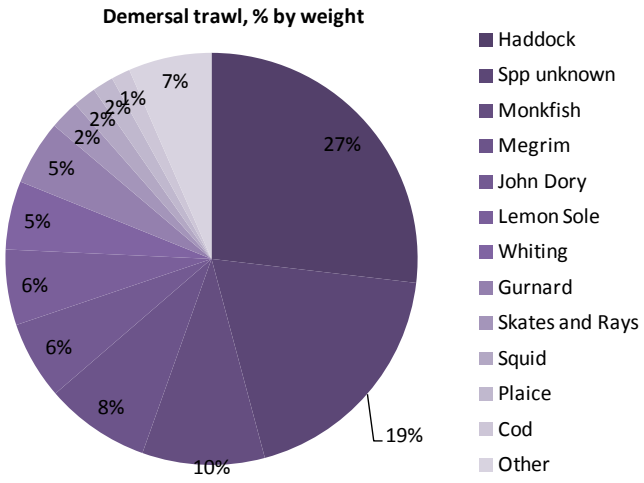


Figure 5.27: Surveillance data, 2007-2011 (MMO, 2012)

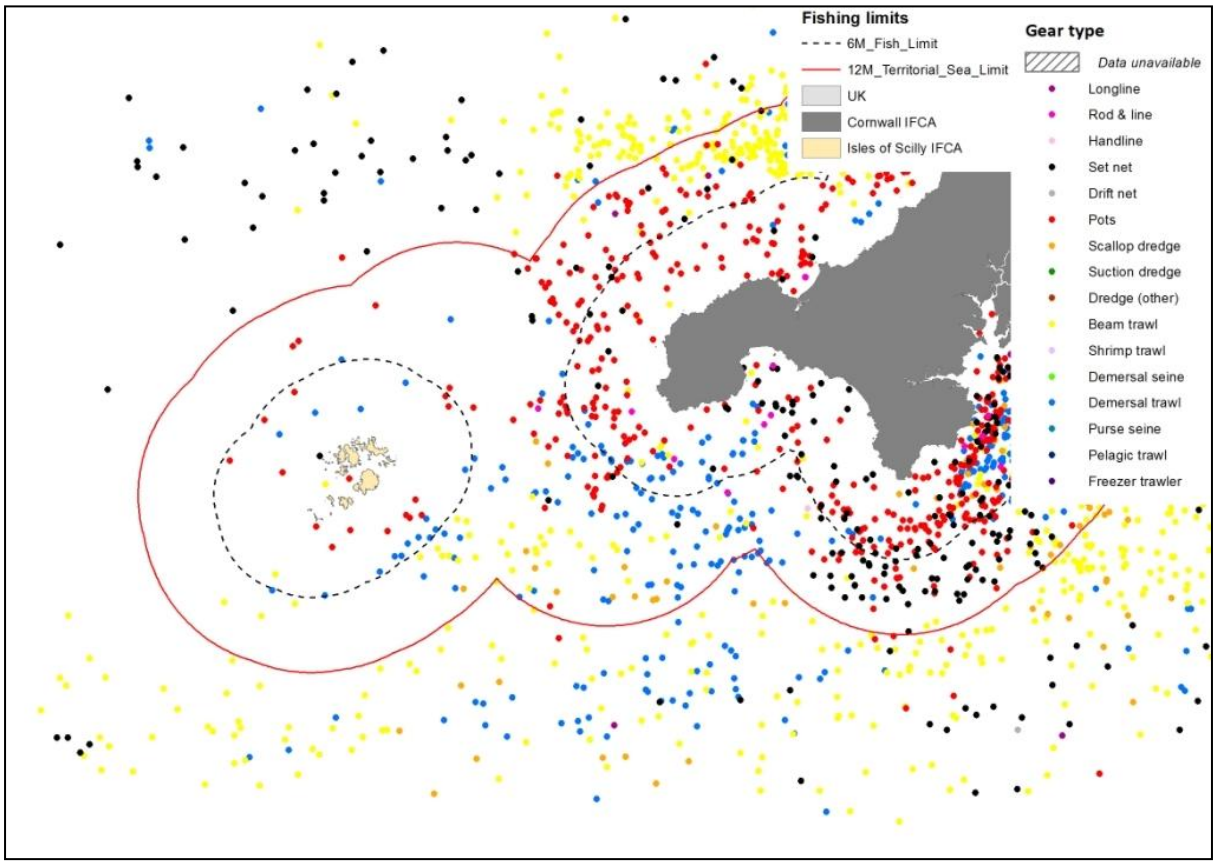
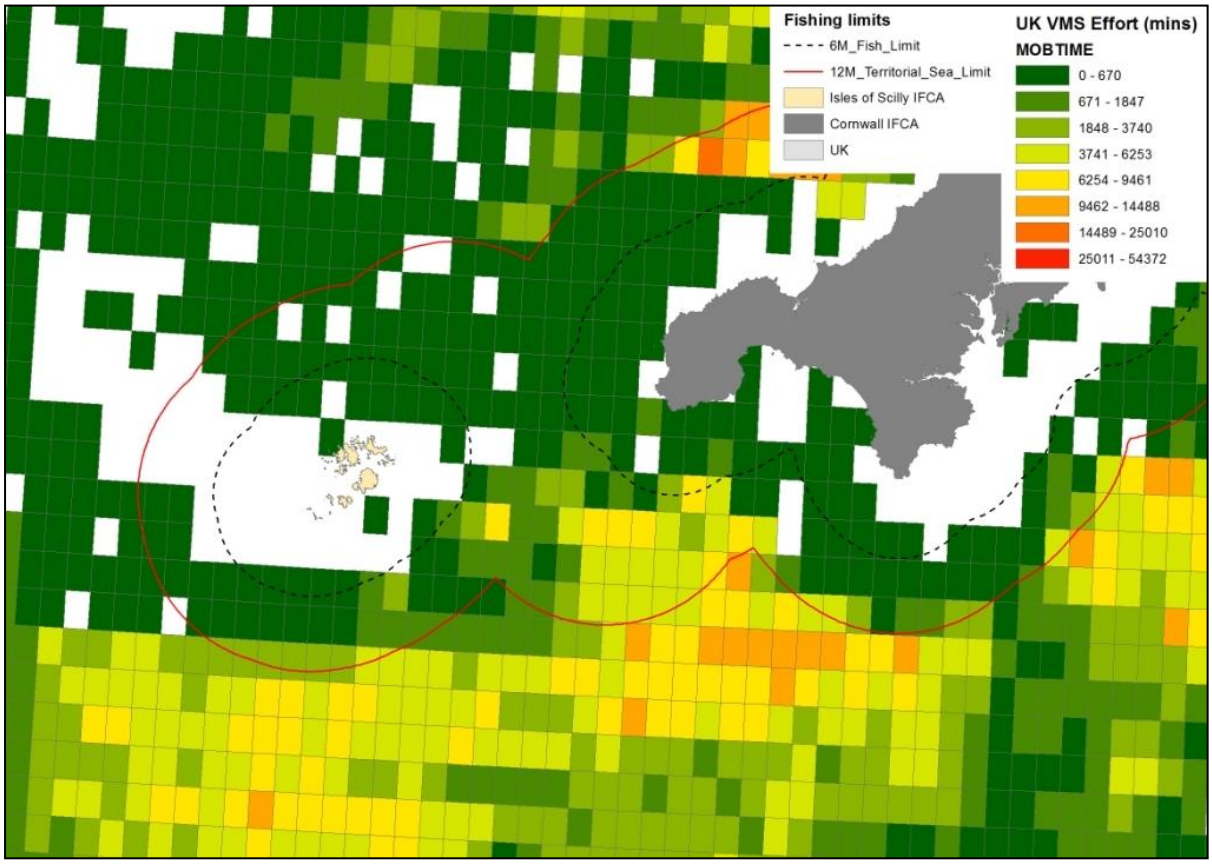


Figure 5.28: VMS effort for all UK mobile vessels ≥15m, 2010 (MMO, 2012)



5.4.1 Identified fisheries

Based on landings data for ICES rectangles that overlap the Isles of Scilly IFCA district the fisheries outlined below are considered important for further assessment:

Finfish fisheries	Demersal trawl (TR1: >100mm)	Demersal trawl (TR2: 80-100mm)	Beam trawl	Dredge	Gill net	Drift net
Demersal flatfish						
Brill	■	■	■	■	■	
Lemon sole	■	■	■			
Megrim	■		■		■	
Plaice	■	■	■		■	
Sole	■	■	■	■	■	■
Turbot	■	■	■	■	■	
Demersal round fish						
Cod	■	■	■		■	■
Haddock	■	■	■		■	
Hake	■	■	■		■	
John dory	■		■		■	
Ling	■	■	■		■	
Monkfish	■	■	■	■	■	
Pollack	■		■		■	
Elasmobranch						
Cuckoo ray	■	■	■		■	
Thornback ray	■	■	■		■	■

Shellfish fisheries	Mechanised dredge	Creel	Hand collection	Beam trawl	Gill net
Scallop	■		■	■	
Squid				■	
Brown crab		■		■	■
Crawfish		■		■	■
Lobster		■			■

5.4.2 Information and reports

The following information and reports have been received from the Isles of Scilly IFCA, sorted based on relevance to each MSC Principle:

Principle 3:

- Isles of Scilly IFCA Byelaws
- Isles of Scilly IFCA Draft review of byelaws
- Isles of Scilly IFCA Annual Plan 2012-2013
- Isles of Scilly IFCA Compliance and Enforcement Strategy

5.5 Kent and Essex

Figure 5.29: ICES rectangles overlapping IFCA

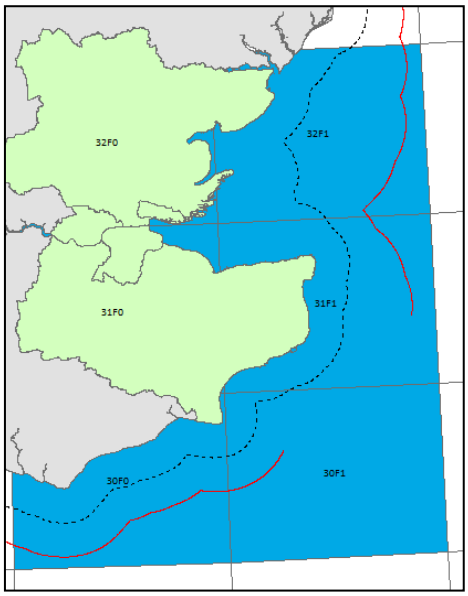
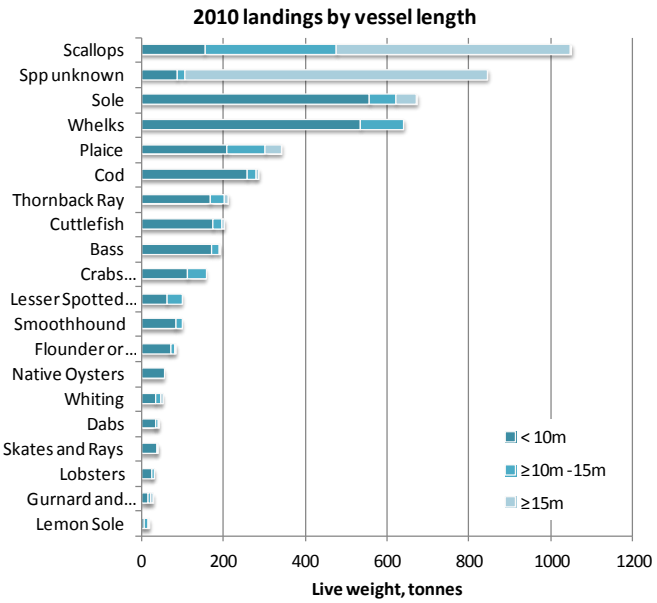


Figure 5.30: Landings by species and vessel length



The figures present landings from the ICES statistical rectangles that overlap the Kent and Essex IFCA district, as illustrated in Figure 5.29. Key species landed from this area include scallops, sole, bass, plaice, whelks and brown crab.

Landings in 2010 were dominated by scallops with over half taken by >15m vessels. The demersal fishery is targeted by under 10m vessels landings sole, plaice, cod, rays, bass and cuttlefish. A significant under 10m potting fleet targets whelk and brown crab. Landings from regulating and several orders (therefore including the significant Thames cockle and Mersea oyster fishery) are not reflected in this MMO derived data.

Figure 5.31: Landings value (top) and weight (bottom) by species for 2006-2010 (MMO, 2012)

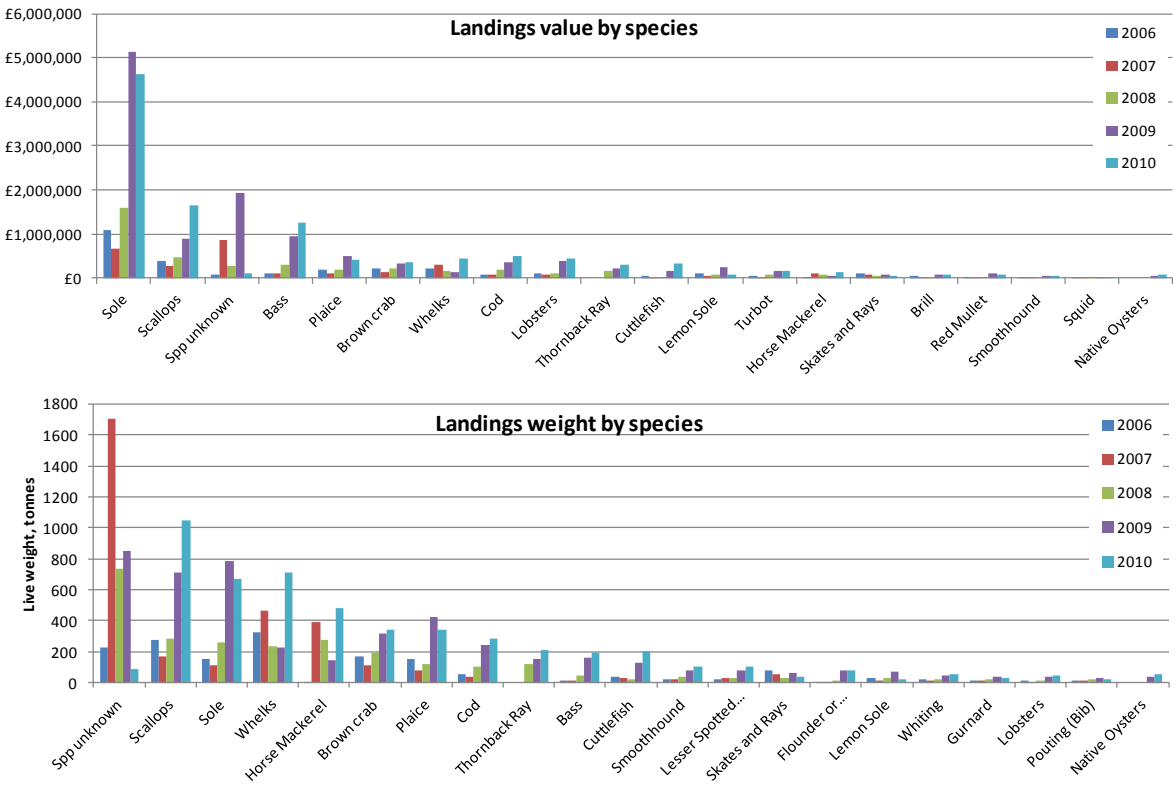
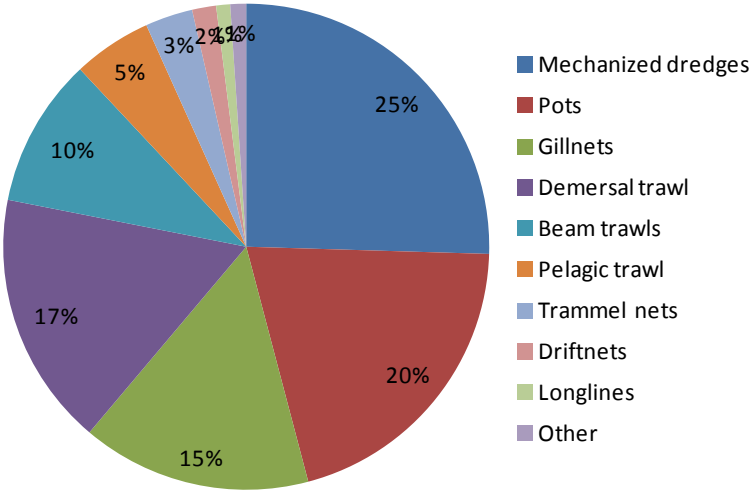


Figure 5.32: Landings by gear type



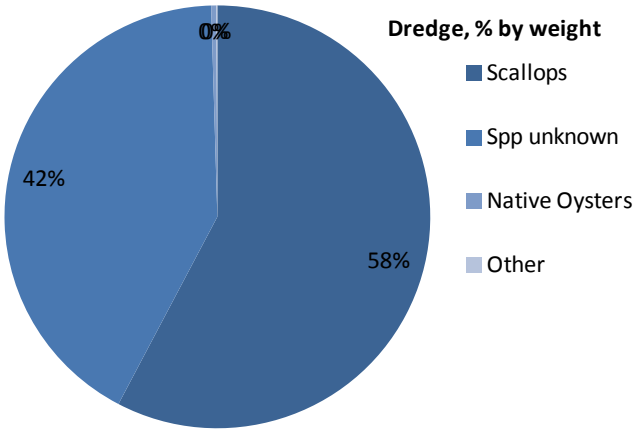
The figure to the left presents landings by weight (amalgamated from 2006-2010) to illustrate proportion of landings from Kent and Essex inshore ICES rectangles by gear type. The figures below present species by gear type on the same basis.

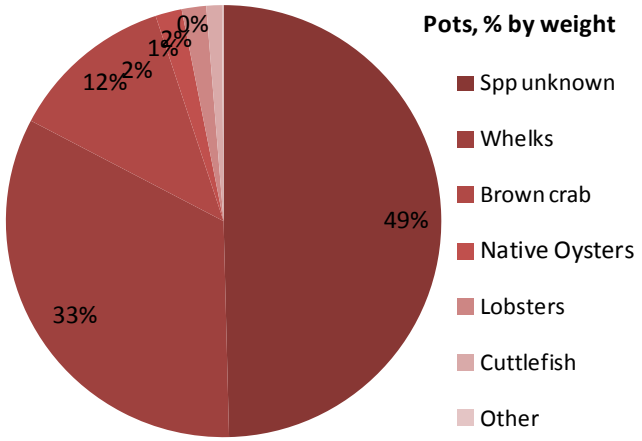
The highest proportion of landings is taken by dredgers targeting scallops and native oysters.

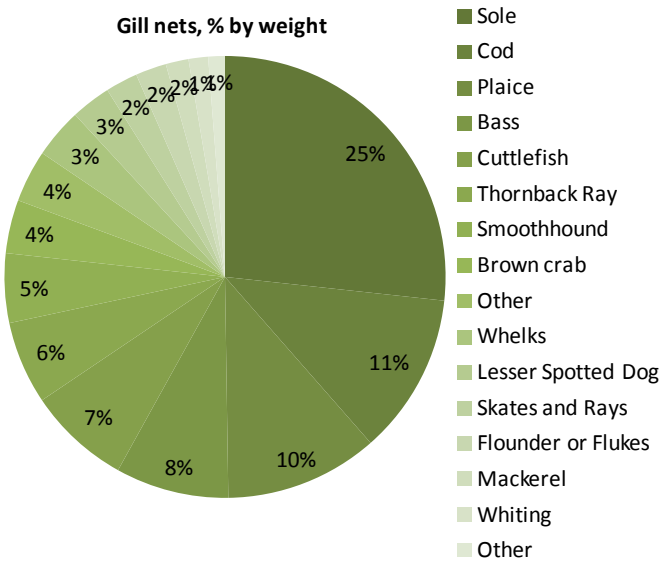
Potters predominately target tow separate fisheries for whelk and brown crab, with small proportions of lobster also taken.

Sole form a quarter of the landings by both gill netters and demersal trawlers – both fisheries take a large range of demersal species including plaice, cod and thornback ray.

Figure 5.33: Landings for top four gears indicating proportion of species landed by weight







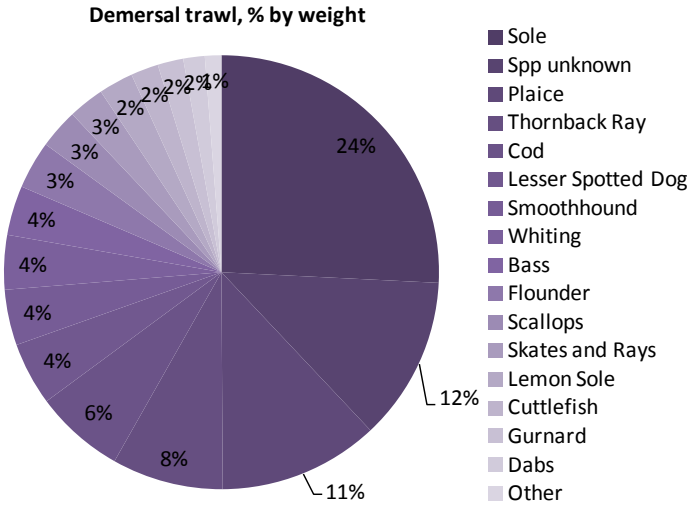


Figure 5.34: Surveillance data, 2007-2011 (MMO, 2012)

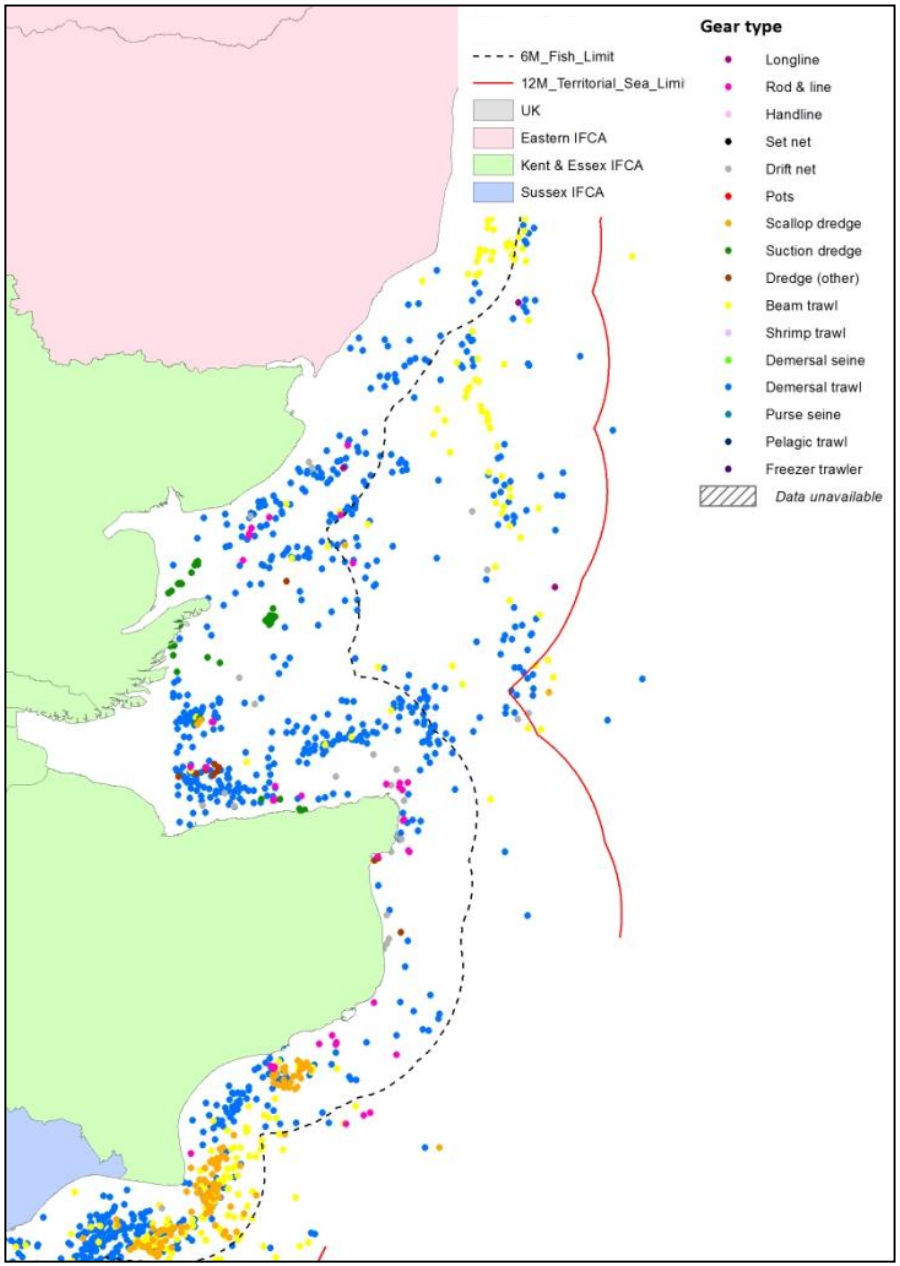
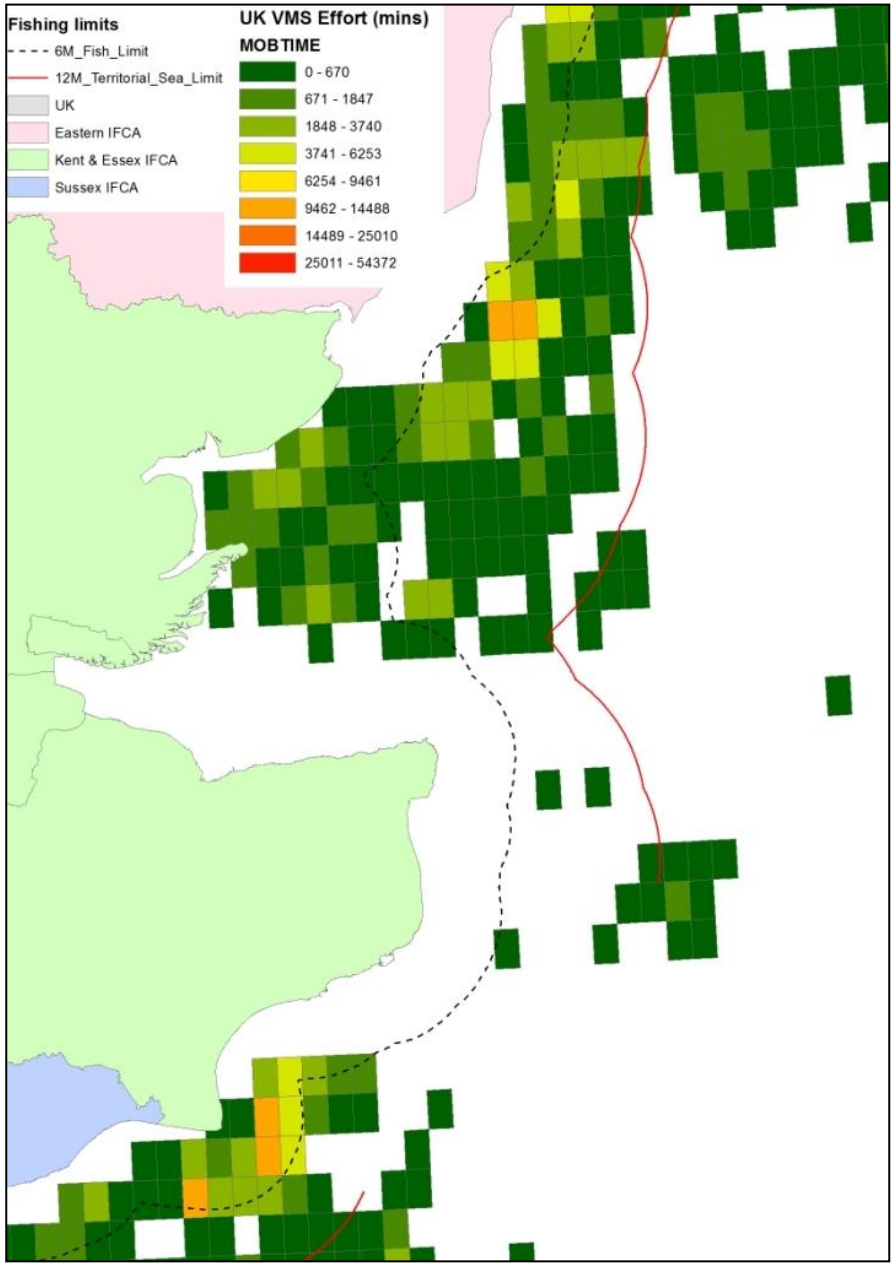


Figure 5.35: VMS effort for all UK mobile vessels ≥15m, 2010 (MMO, 2012)



5.5.1 Identified fisheries

Based on landings data for ICES rectangles that overlap the Kent and Essex IFCA district the fisheries outlined below are considered important for further assessment:

Finfish fisheries	Demersal trawl (TR1: >100mm)	Demersal trawl (TR2: 80-100mm)	Beam trawl	Dredge	Pelagic trawl	Gill net	Trammel net	Drift net	Long line
Demersal flatfish									
Brill									
Dab									
Flounder									
Lemon sole									
Plaice									
Sole									
Turbot									
Demersal round fish									
Bass									
Cod									
Elasmobranch									
Thornback ray									
Pelagic fish									
Herring									
Horse mackerel									
Sprat									

Shellfish fisheries	Mechanised dredge	Creel	Whelk pot	Trap	Hand collection	Demersal trawl	Beam trawl	Gill net
Cockle								
Mussel								
Native oyster								
Scallop								
Cuttlefish								
Brown crab								
Lobster								
Whelk								

5.5.2 Information and reports

The following information and reports have been received from the Kent and Essex IFCA, sorted based on relevance to each MSC Principle:

Principle 1:

- Cockle Survey Report, 2011
- Cockles Compilation Report 1987-2011

Principle 3:

- Kent and Essex IFCA Byelaws
- Kent and Essex IFCA Annual Plan 2012-2013
- Kent and Essex IFCA Research Plan 2012-2013
- Kent and Essex IFCA Strategic Research Plan 2012-2015

5.6 North Eastern

Figure 5.36: ICES rectangles overlapping IFCA

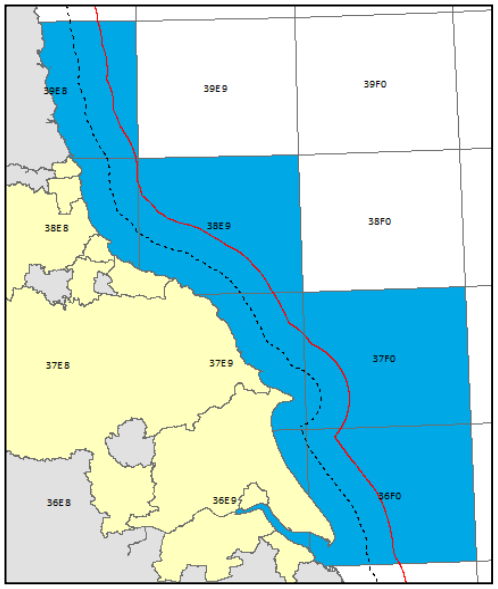
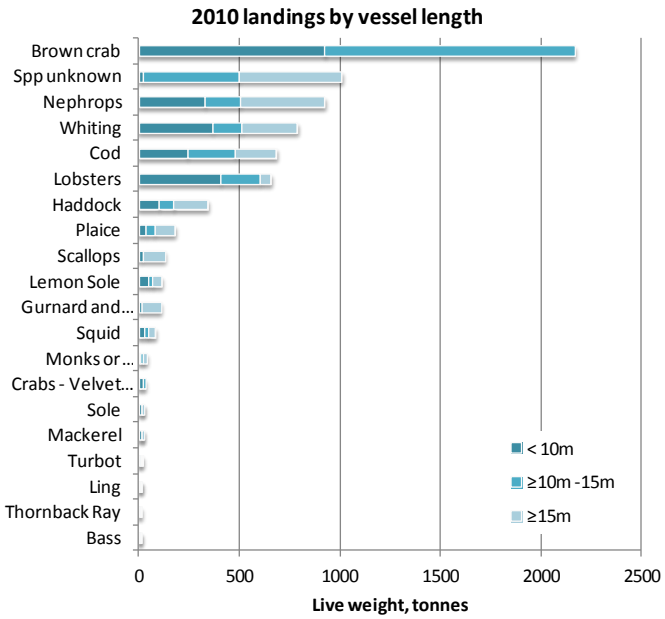


Figure 5.37: Landings by species and vessel length



The figures present landings from the ICES statistical rectangles that overlap the North Easter IFCA district, as illustrated in Figure 5.36. Key species landed from this area include lobster, nephrops, brown crab, cod, whiting and haddock.

Landings in 2010 were dominated by brown crab, which were entirely taken by vessels under 15m in length. Under 15m vessels also target nephrops, whiting, cod and lobster. The over 15m fleet are predominately demersal otter trawlers targeting nephrops, cod, whiting and haddock.

Figure 5.38: Landings value (top) and weight (bottom) by species for 2006-2010 (MMO, 2012)

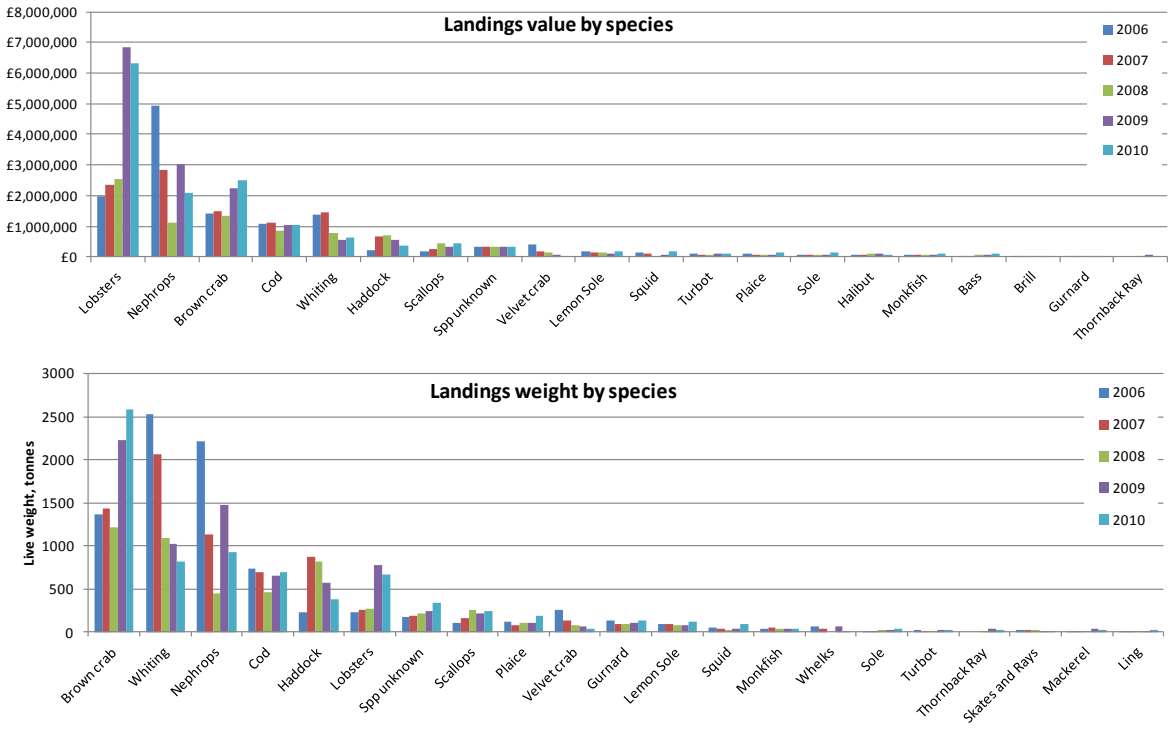
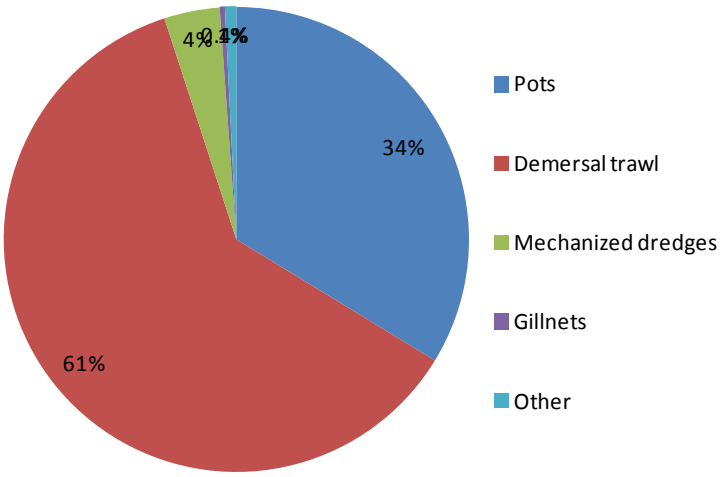


Figure 5.39: Landings by gear type



The figure to the left presents landings by weight (amalgamated from 2006-2010) to illustrate proportion of landings from North Eastern inshore ICES rectangles by gear type. The figures below present species by gear type on the same basis.

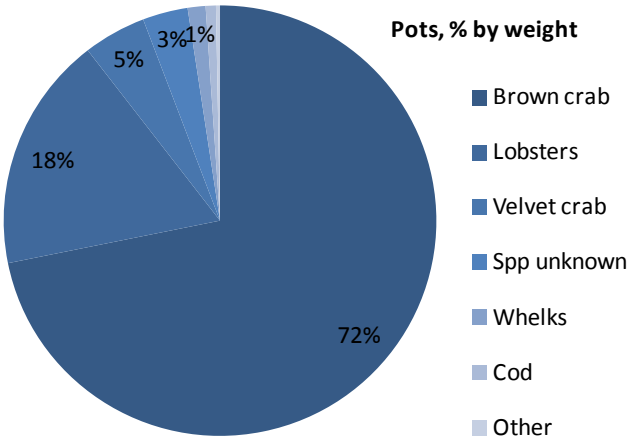
The highest proportion of landings is taken by pots targeting brown crab, lobsters and velvet crab.

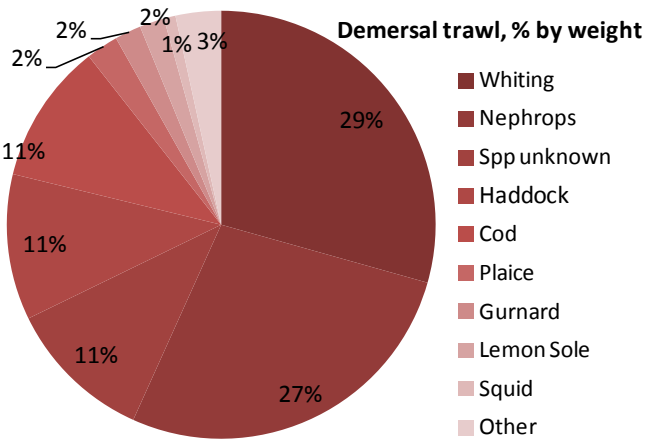
Demersal trawl target whiting, nephrops, haddock and cod, with smaller proportions of plaice, gurnard and lemon sole taken as retained catch.

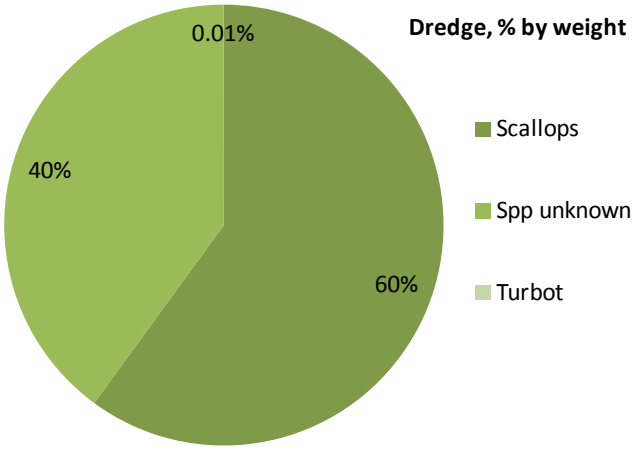
Dredgers are focused on a scallop fishery with minimal retained levels of turbot.

The gill net fishery targets cod and also lands whiting, pollack, ling and small proportions of brown crab.

Figure 5.40: Landings for top four gears indicating proportion of species landed by weight







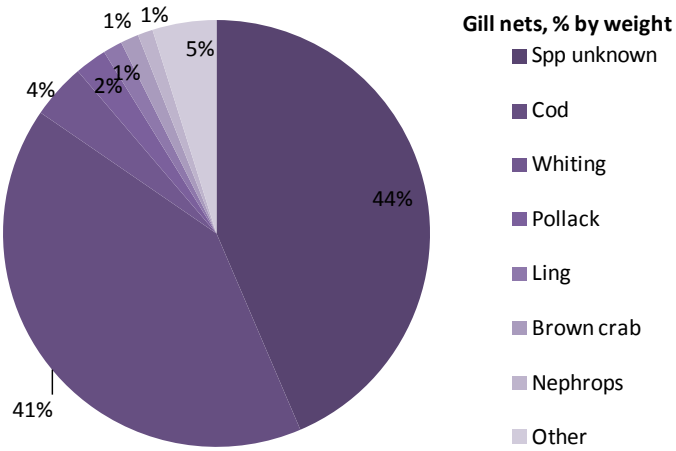


Figure 5.41: Surveillance data, 2007-2011 (MMO, 2012)

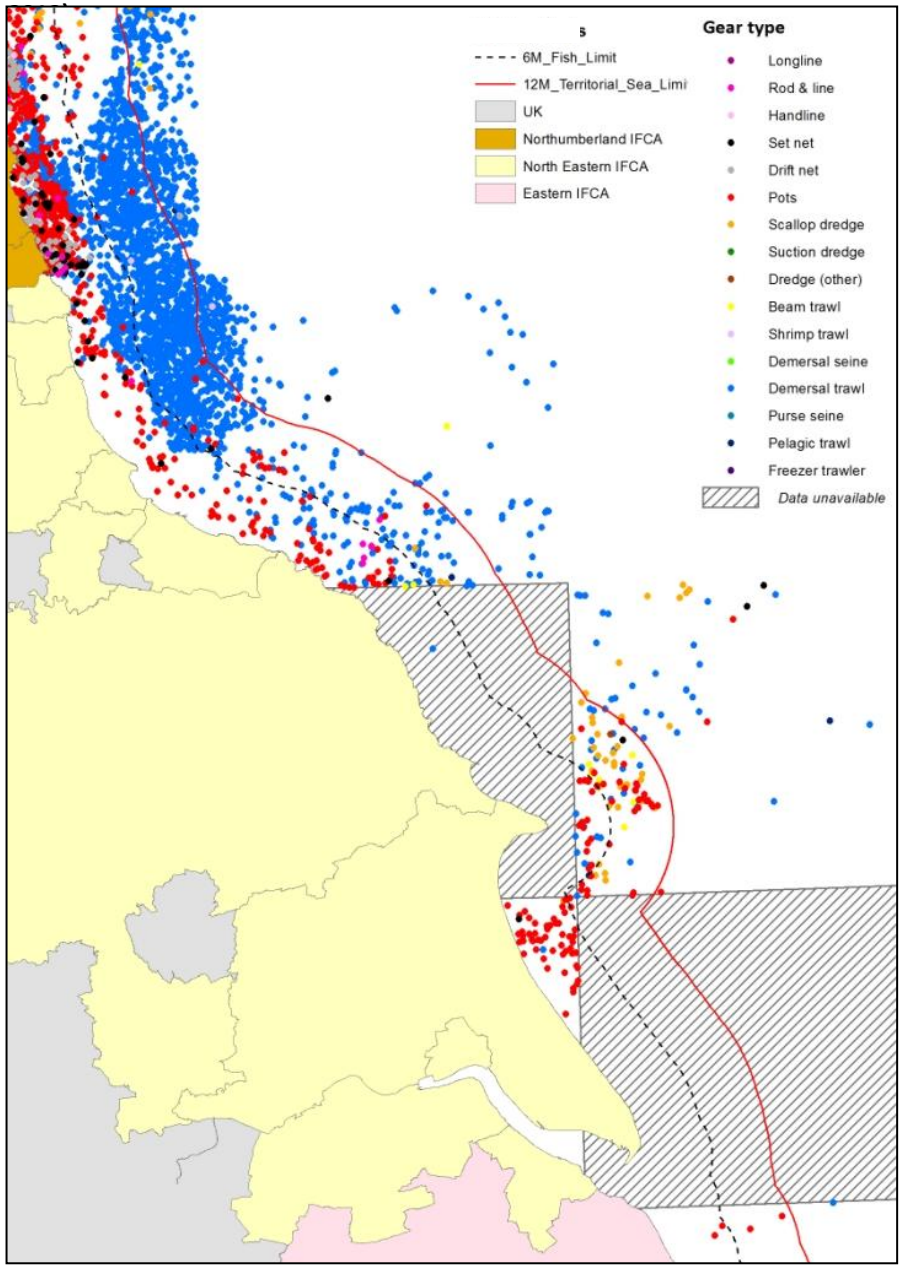
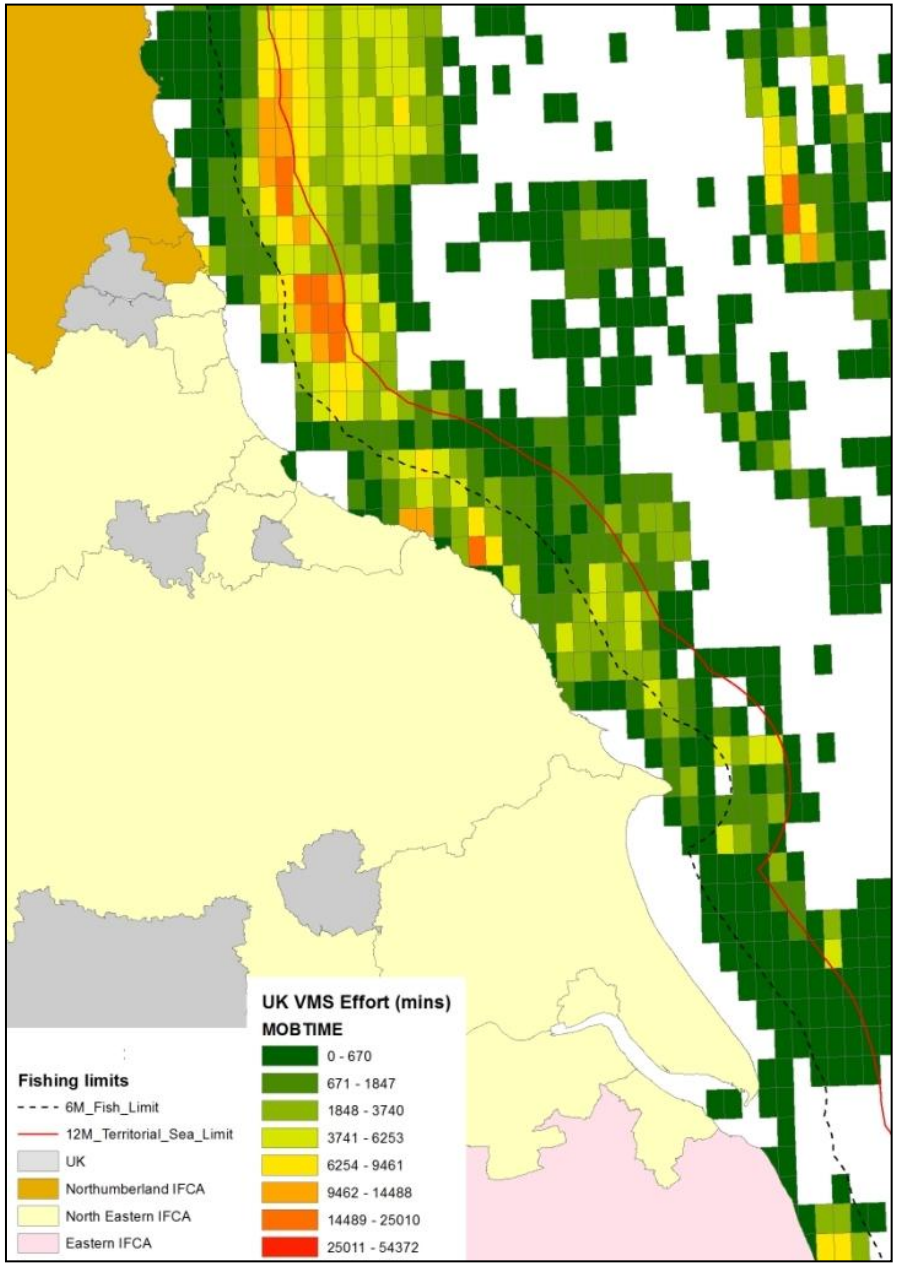


Figure 5.42: VMS effort for all UK mobile vessels ≥15m, 2010 (MMO,



5.6.1 Identified fisheries

Based on landings data for ICES rectangles that overlap the North Eastern IFCA district the fisheries outlined below are considered important for further assessment:

Finfish fisheries	Demersal trawl (TR1: >100mm)	(TR2: 80-100mm)	Beam trawl	Pelagic trawl	Dredge	Gill net	Trammel net	Drift net	Long line	Handline and pole-line	Hooks & line
Demersal flatfish											
Brill	■	■	■		■	■	■				
Halibut	■	■									
Lemon sole	■	■	■								
Plaice	■	■	■			■	■				
Sole	■	■	■		■	■	■	■			
Turbot	■	■	■		■	■	■				
Witch	■	■	■		■	■	■				
Demersal round fish											
Bass	■		■			■	■	■		■	■
Cod	■	■	■			■	■	■	■		
Haddock	■	■	■			■					
Ling	■	■	■			■					
Monkfish	■	■	■			■					
Pollack	■	■	■			■					
Saithe	■	■	■			■					
Whiting	■	■	■			■					
Elasmobranch											
Thornback ray	■	■	■			■	■	■	■		
Pelagic fish											
Herring				■							
Mackerel										■	

Shellfish fisheries	Mechanised dredge	Creel	Whelk pot	Hand collection	Demersal trawl	Beam trawl	Gill net
Scallop	■			■	■	■	
Squid					■	■	
Brown crab		■	■			■	■
Velvet crab		■	■				
Lobster		■	■				■
Nephrops		■	■		■		
Brown shrimp						■	
Periwinkle				■			
Whelk			■				

5.6.2 Information and reports

The following information and reports have been received from the North Eastern IFCA, sorted based on relevance to each MSC Principle:

Principle 3:

- North Eastern IFCA Byelaws

General:

- Shellfish Fisheries Strategic Environmental Assessment, 2008

5.7 North Western

Figure 5.43: ICES rectangles overlapping IFCA

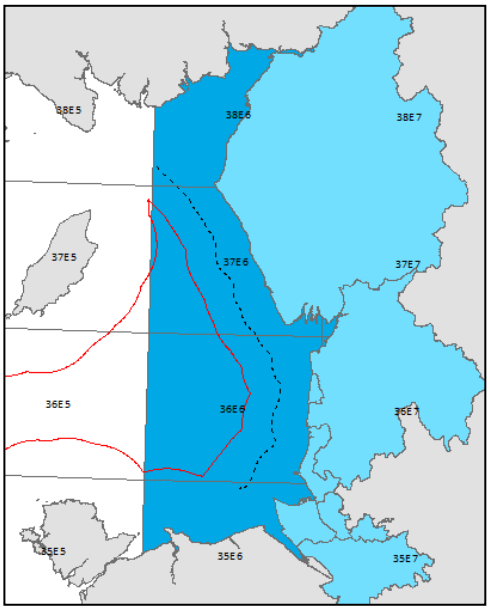
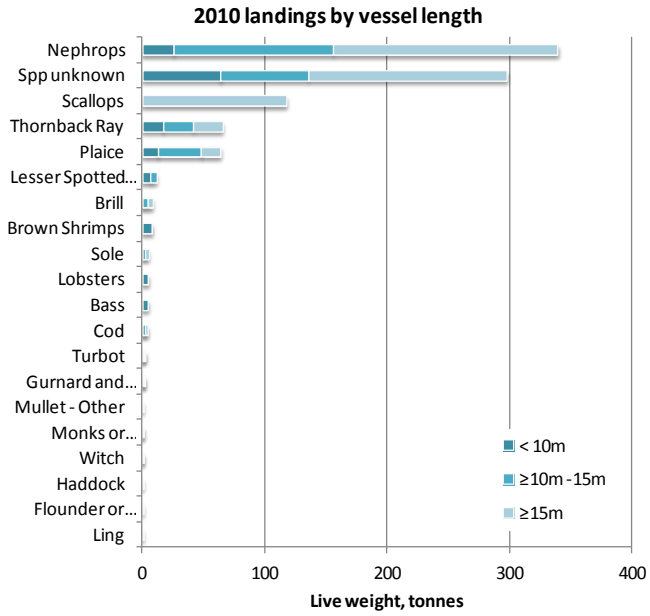


Figure 5.44: Landings by species and vessel length



The figures present landings from the ICES statistical rectangles that overlap the North Western IFCA district, as illustrated in Figure 5.43. Key species landed from this area include nephrops, scallops, plaice, sole and thornback ray.

Landings in 2010 were dominated by nephrops, with the majority taken by over 10m vessels. Scallops are only taken by vessels >15m, while plaice, sole and thornback ray are taken across all vessel sizes.

A whelk fishery has not been targeted since 2006, nor has the queen scallop fishery.

Figure 5.45: Landings value (top) and weight (bottom) by species for 2006-2010 (MMO, 2012)

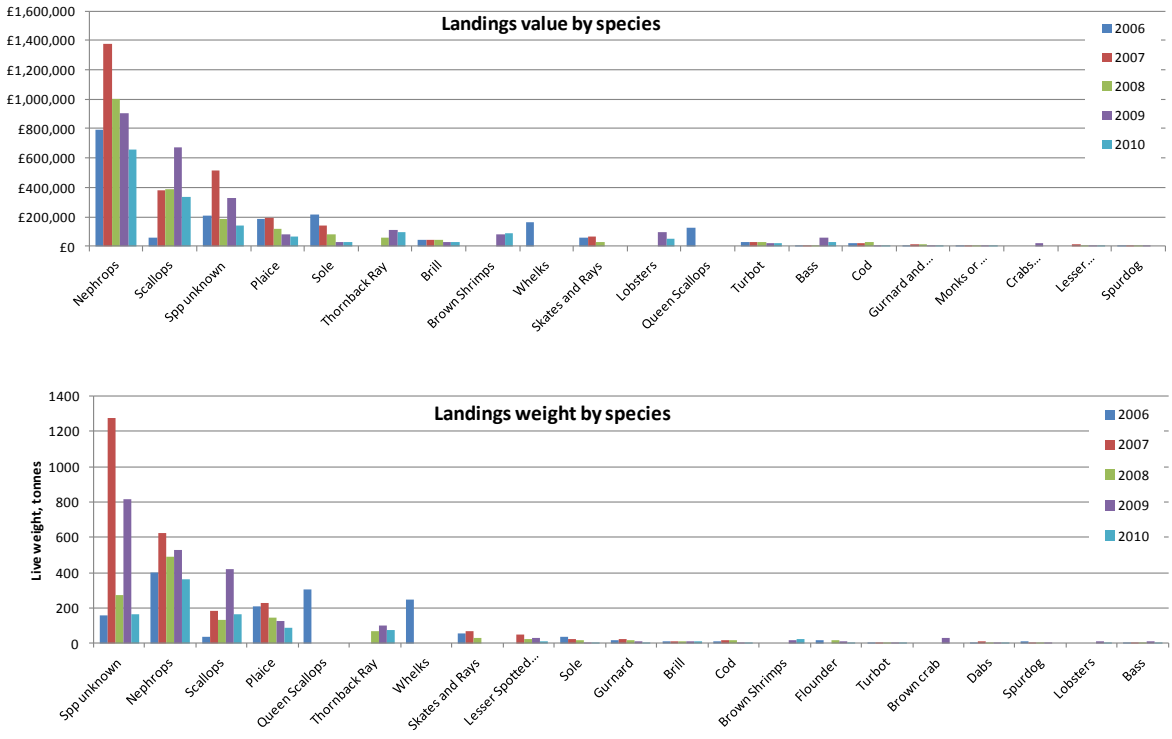
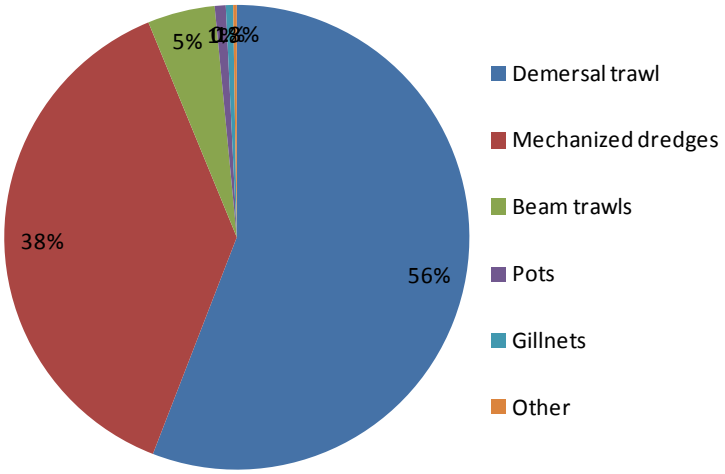


Figure 5.46: Landings by gear type



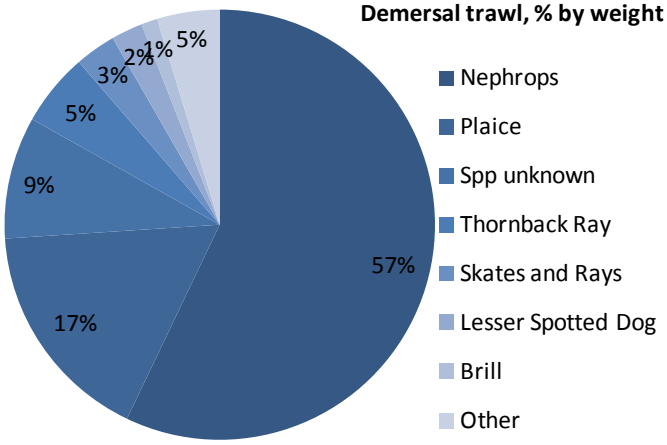
The figure to the left presents landings by weight (amalgamated from 2006-2010) to illustrate proportion of landings from North Western inshore ICES rectangles by gear type. The figures below present species by gear type on the same basis.

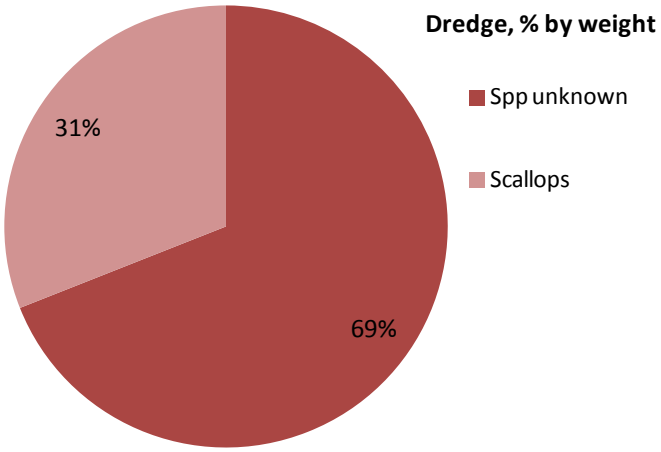
The highest proportion of landings is taken by demersal trawl where nephrops and plaice make up the majority of the catch, with smaller proportions of thornback ray and other ray species taken as retained catch.

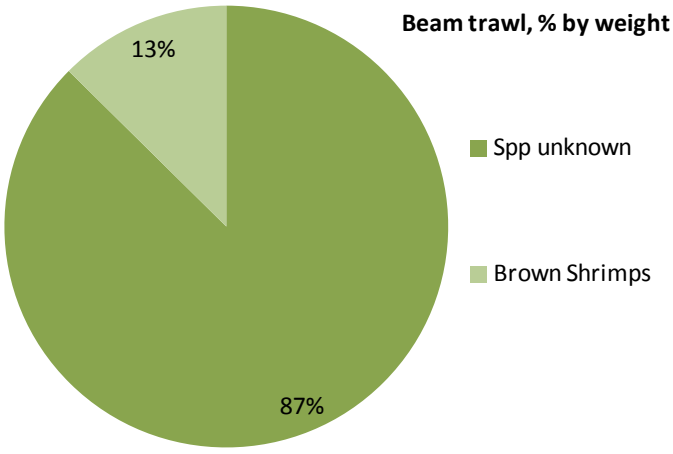
Dredgers solely target scallops and beam trawlers target brown shrimp.

Landings by pots are dominated by brown crab and lobster.

Figure 5.47: Landings for top four gears indicating proportion of species landed by weight







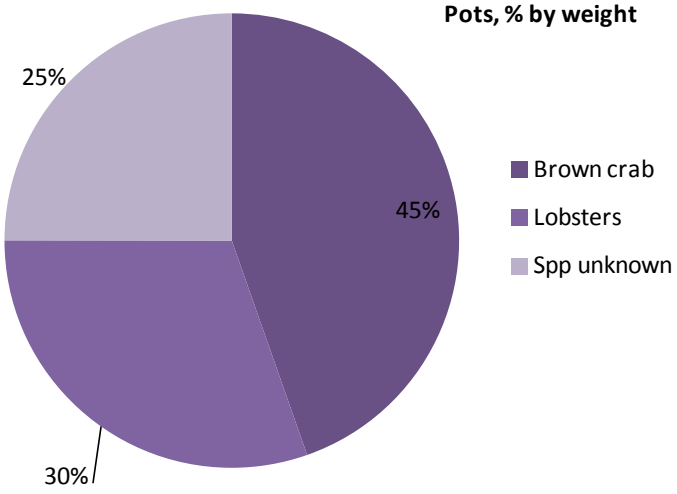


Figure 5.48: Surveillance data, 2007-2011 (MMO, 2012)

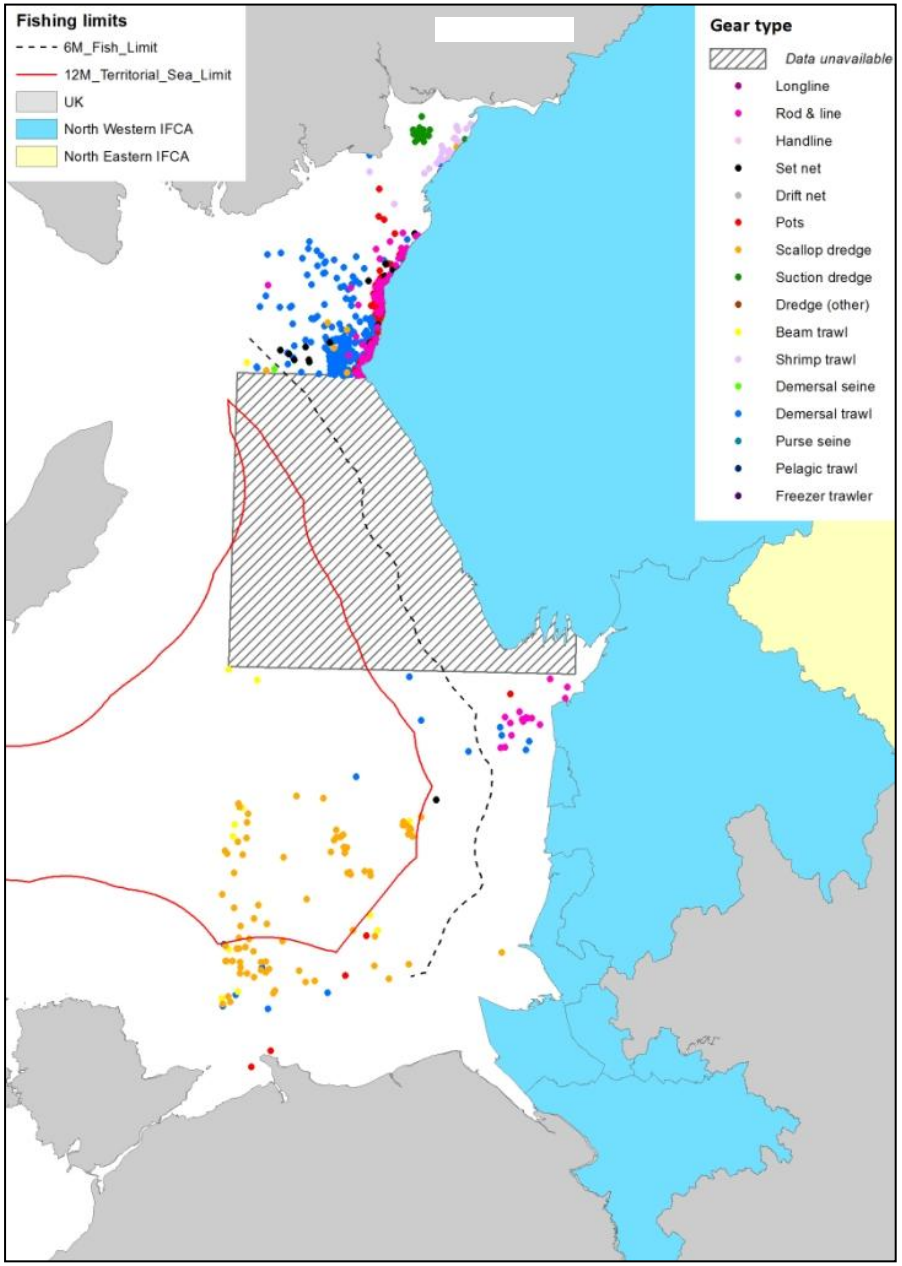
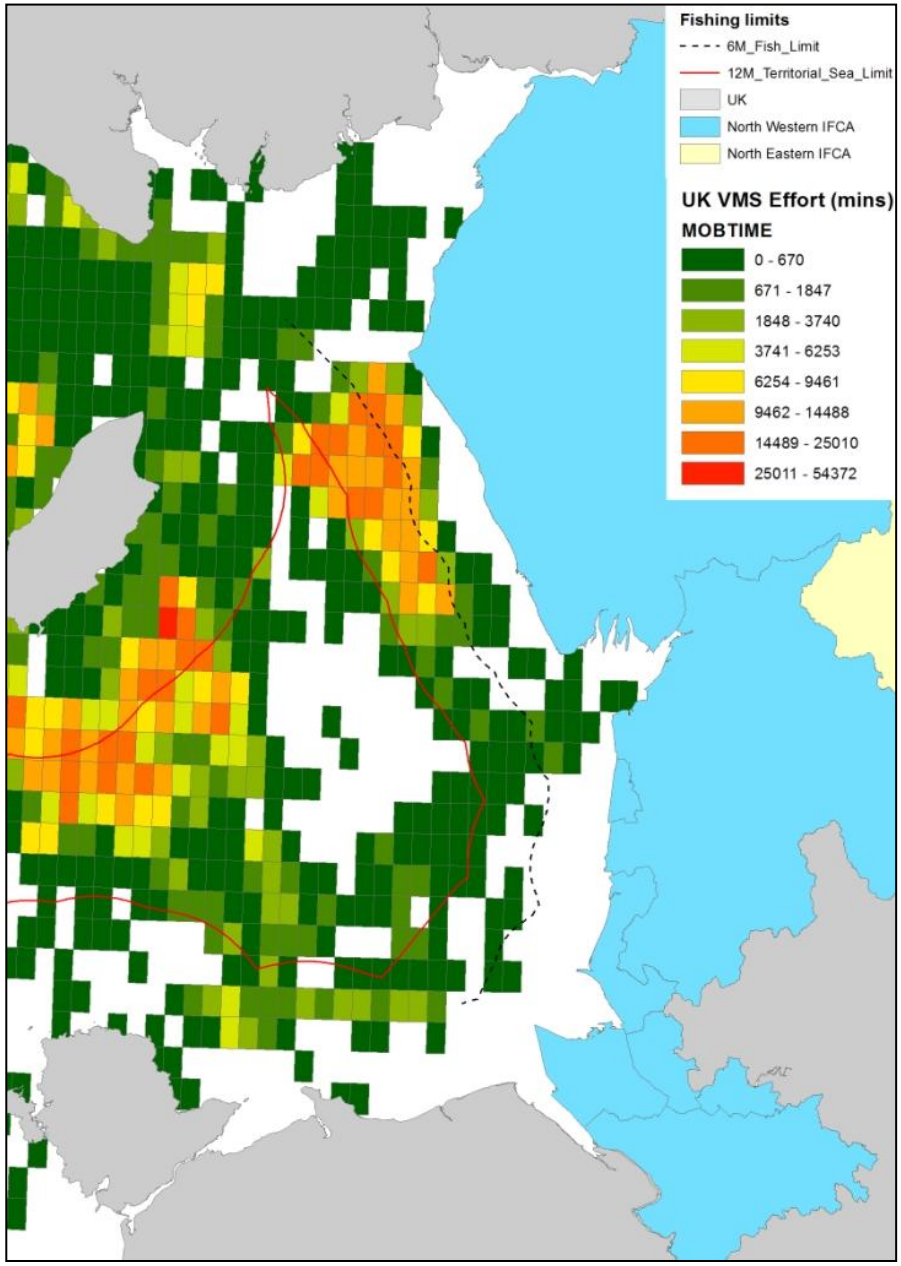


Figure 5.49: VMS effort for all UK mobile vessels ≥15m, 2010 (MMO, 2012)



5.7.1 Identified fisheries

Based on landings data for ICES rectangles that overlap the North Western IFCA district the fisheries outlined below are considered important for further assessment:

Finfish fisheries	Demersal trawl (TR1: >100mm)	Demersal trawl (TR2: 80-100mm)	Beam trawl	Dredge	Gill net	Trammel net
Demersal flatfish						
Brill						
Flounder						
Plaice						
Sole						
Turbot						
Demersal roundfish						
Bass						
Cod						
Haddock						
Whiting						
Elasmobranch						
Thornback ray						

Shellfish fisheries	Mechanised dredge	Creel	Whelk pot	Hand collection	Demersal trawl	Beam trawl	Gill net
Cockle							
Mussel							
Scallop							
Brown crab							
Lobster							
Nephrops							
Brown shrimp							
Whelk							
Periwinkle							
Razorshell							

Cockle and mussel fisheries

The cockle fishery is one of the most important fisheries in the North Western IFCA district, however this is not reflected in the national landings database. The reason for this is that the main method of harvest is hand gathering, for which there is no reporting requirement and landings information is

therefore not passed on to either MMO or DEFRA (or the IFCA themselves). Landings by dredge are likely to be undertaken by a small number of large vessels, and therefore will appear in the 'species unknown' category of the landing statistics presented.

There are three types of mussel fisheries in the NW IFCA district: hand gathered, dredge and a seed focused dredge fishery (for re-laying into aquaculture elsewhere, including Wales). As with cockles, the quantities of hand gathered mussels are not recorded. Landings of dredge mussels are also likely to be by a small number of large vessels, so again will be included within the 'species unknown' category. The NW IFCA provided data illustrating that 280 tonnes of mussels were landed from the Cumbria area in 2011. Data from mussel seed dredge fisheries are not included in the MMO statistics since these are not typically sold, but re-layed for aquaculture production. The NW IFCA provided data illustrating that 7,900 tonnes of mussel seed were harvest in 2011.

In spite of the absence of both cockles and mussels from the statistics, these are included as fisheries to be taken forward into the 2nd stage of the pre-assessment process.

5.7.2 Information and reports

The following information and reports have been received from the North Western IFCA, sorted based on relevance to each MSC Principle:

Principle 1:

- Interim report on wet dredging trials and cockle stocks in the Ribble Estuary, April 2003
- Mussel stock assessments for Cumbria, Dee Fleetwood and Morecambe Bay
- Cockle stock assessments for Cumbria, Morecambe Bay, Ribble and Wirral
- Experimental studies on the effects of shore crab collection using artificial shelters on an intertidal mud habitat

Principle 2:

- A Summary of the Environmental Impacts of Mechanical Tractor Harvesting and Hydraulic Suction Dredging on Cockles
- North Western IFCA Science and Environment Report, 2011

Principle 3:

- North Western IFCA Byelaws
- North Western IFCA Fisheries Report, 2011
- North Western IFCA Enforcement Directors Report, 2012
- North Western IFCA Quarterly Report, 2011
- North Western IFCA Science Quarterly Report, 2012
- North Western IFCA Annual Plan 2012-2013
- North Western IFCA Compliance and Enforcement Strategy, 2012
- North Western IFCA Budget 2011-12 and 2012-13
- North Western IFCA staff hierarchy
- North Western IFCA Science Plan, 2012
- Management Plan for the Morecambe Bay Hybrid Fishery Order

General:

- Cockle and mussel (including seed) landings 2003-2010

5.8 Northumberland

Figure 5.50: ICES rectangles overlapping IFCA

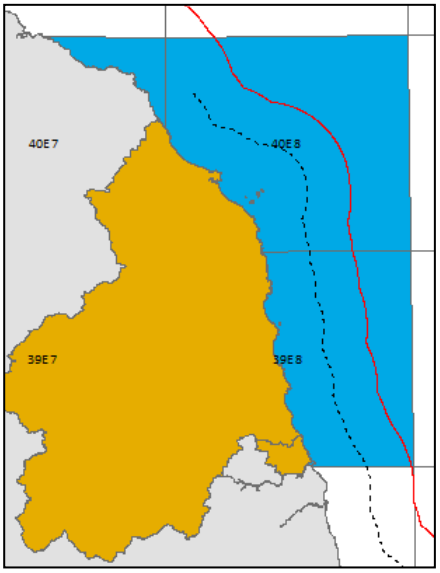
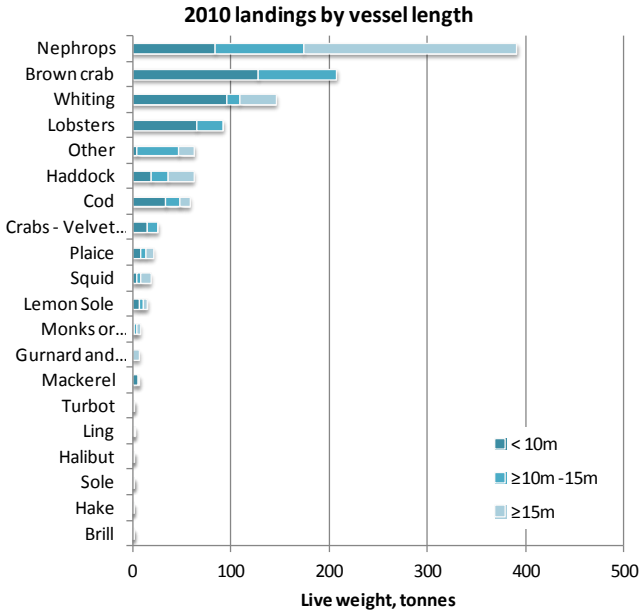


Figure 5.51: Landings by species and vessel length



The figures present landings from the ICES statistical rectangles that overlap the Northumberland IFCA district, as illustrated in Figure 5.50. Key species landed from this area include nephrops, lobster, brown crab, whiting, haddock and cod.

Landings in 2010 were dominated by nephrops with approximately half landed by over 15m vessels, also taking retained species of whiting, haddock and cod. Brown crab and lobster are entirely landed by under 15m vessels, with the majority being under 10m.

Figure 5.52: Landings value (top) and weight (bottom) by species for 2006-2010 (MMO, 2012)

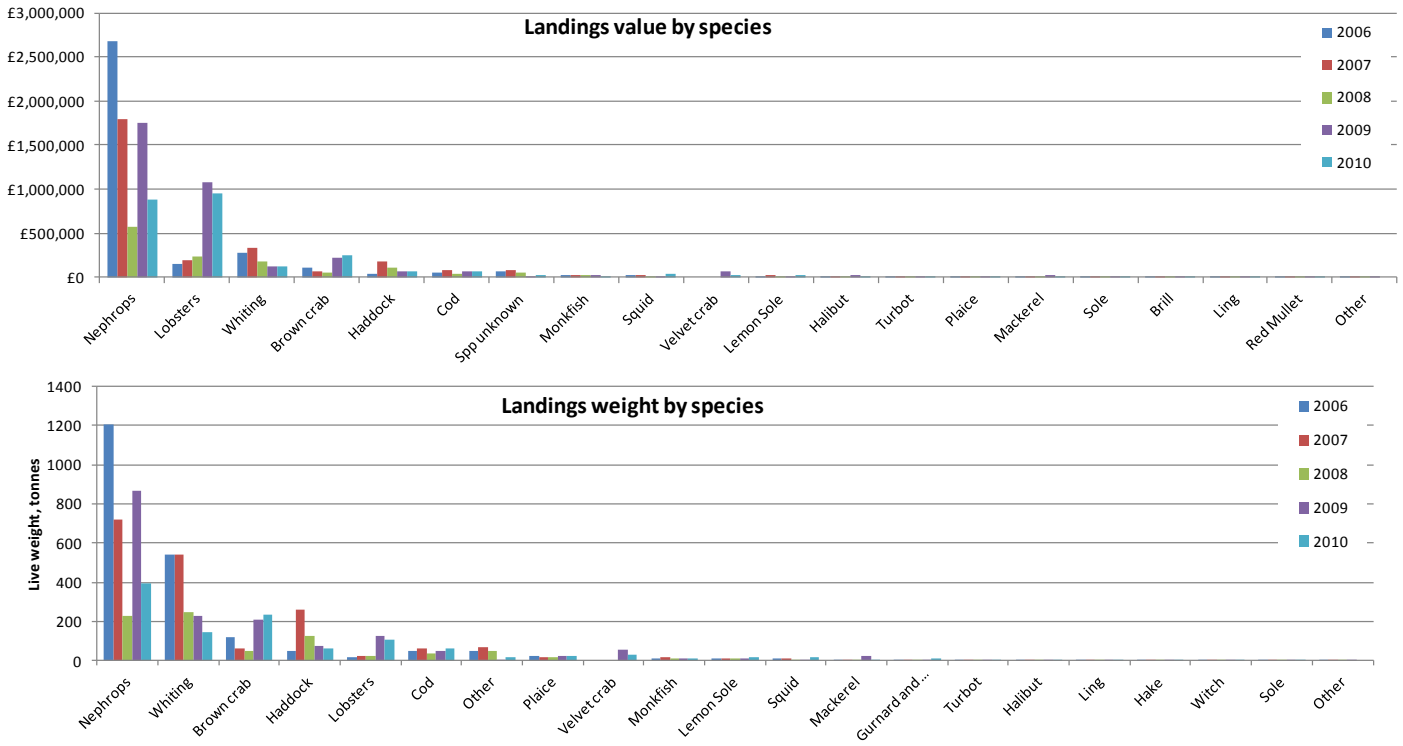
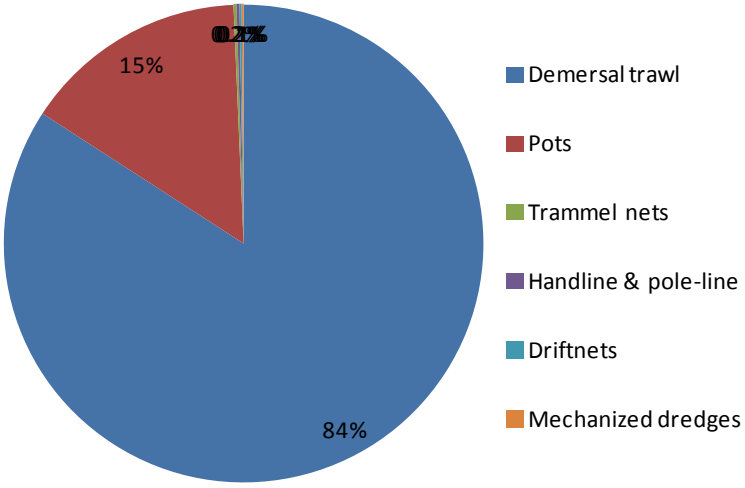


Figure 5.53: Landings by gear type



The figure to the left presents landings by weight (amalgamated from 2006-2010) to illustrate proportion of landings from Northumberland inshore ICES rectangles by gear type. The figures below present species by gear type on the same basis.

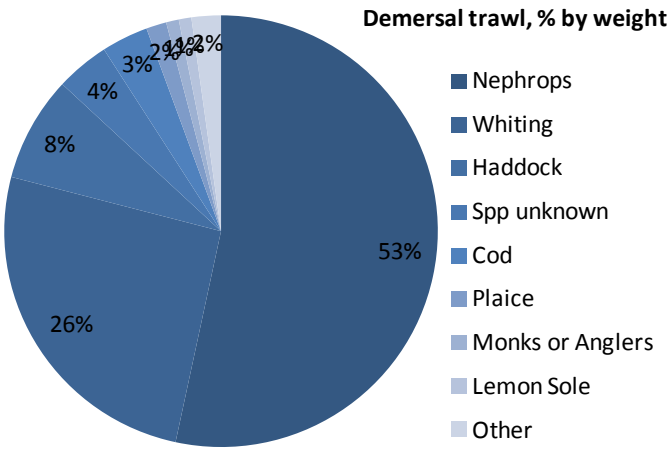
The highest proportion of landings is taken by demersal trawl where nephrops form over half of the catch in weight and whiting make up a quarter; other species landed include haddock, cod and plaice.

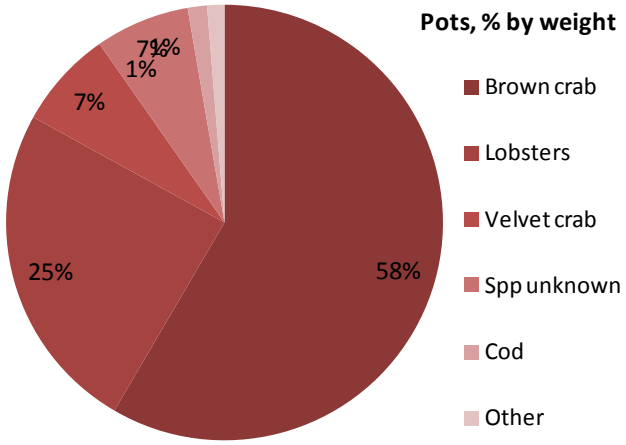
Landings by pots are dominated by brown crab, lobster and velvet crab.

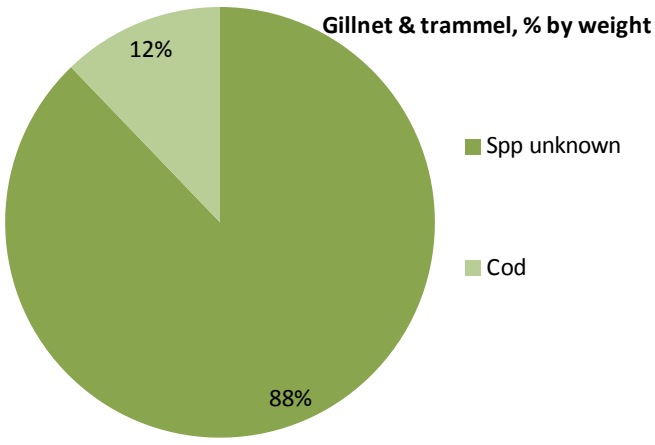
Due to the lack of detail within the landings data the composition of the gill and trammel net fishery is largely unknown, but does include cod.

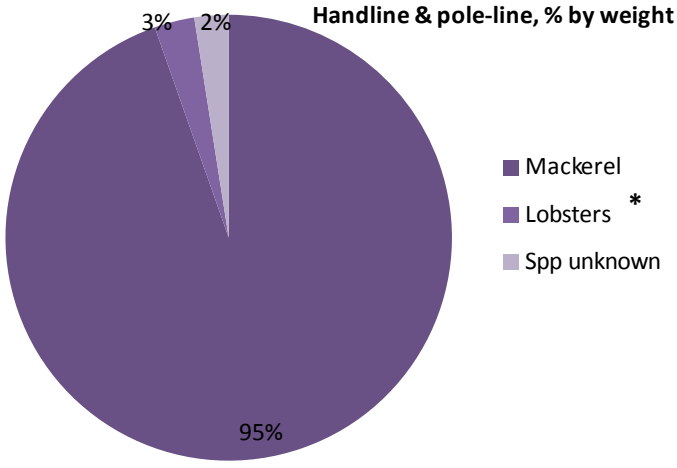
Handline and pole-line land mackerel almost exclusively, with small levels of lobster also reported.

Figure 5.54: Landings for top four gears indicating proportion of species landed by weight









* Where anomalies such as lobster / handline exist, this is a true reflection of the data and could be due to mis-reporting or a vessel being registered as one gear type but occasionally using another gear.

Figure 5.55: Surveillance data, 2007-2011 (MMO, 2012)

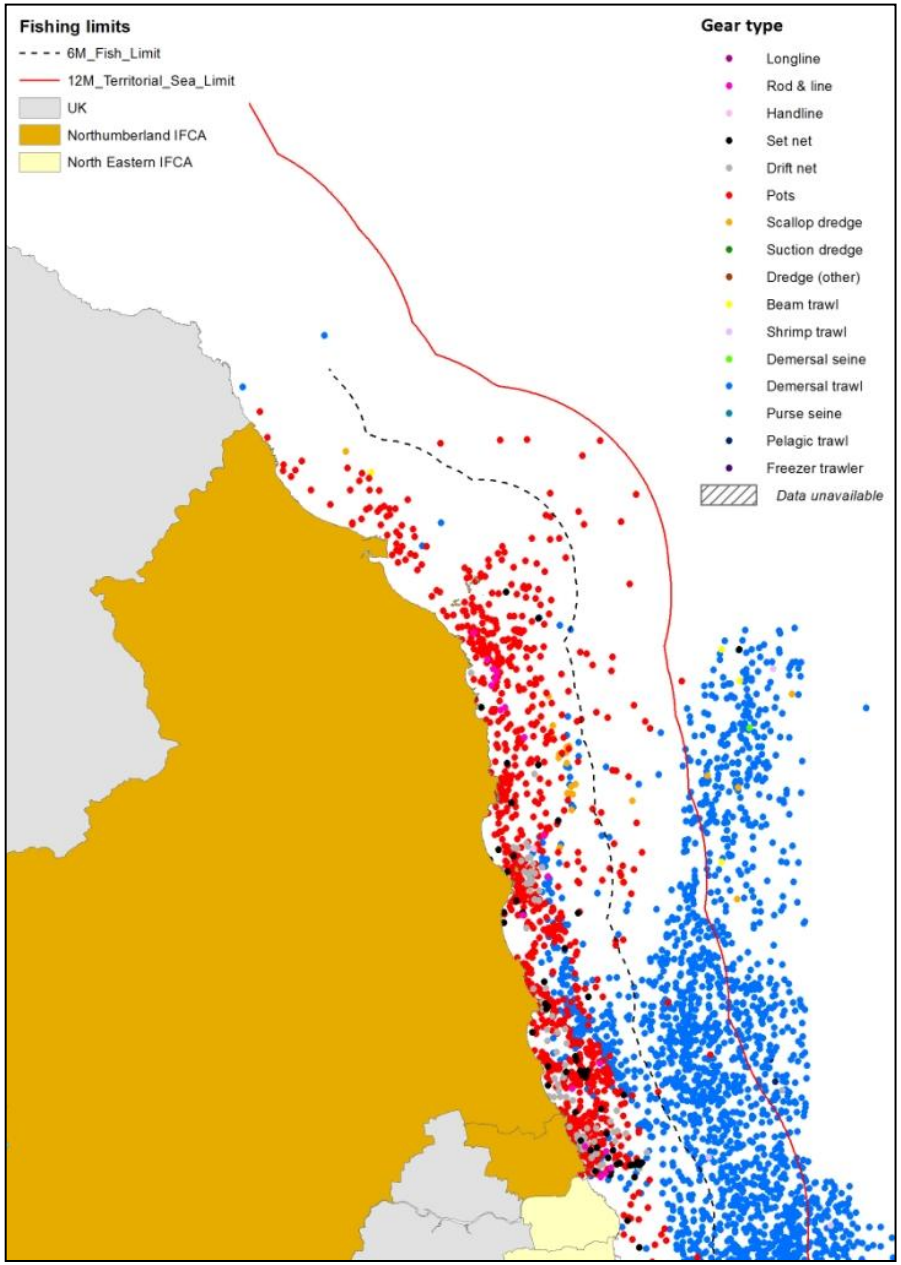
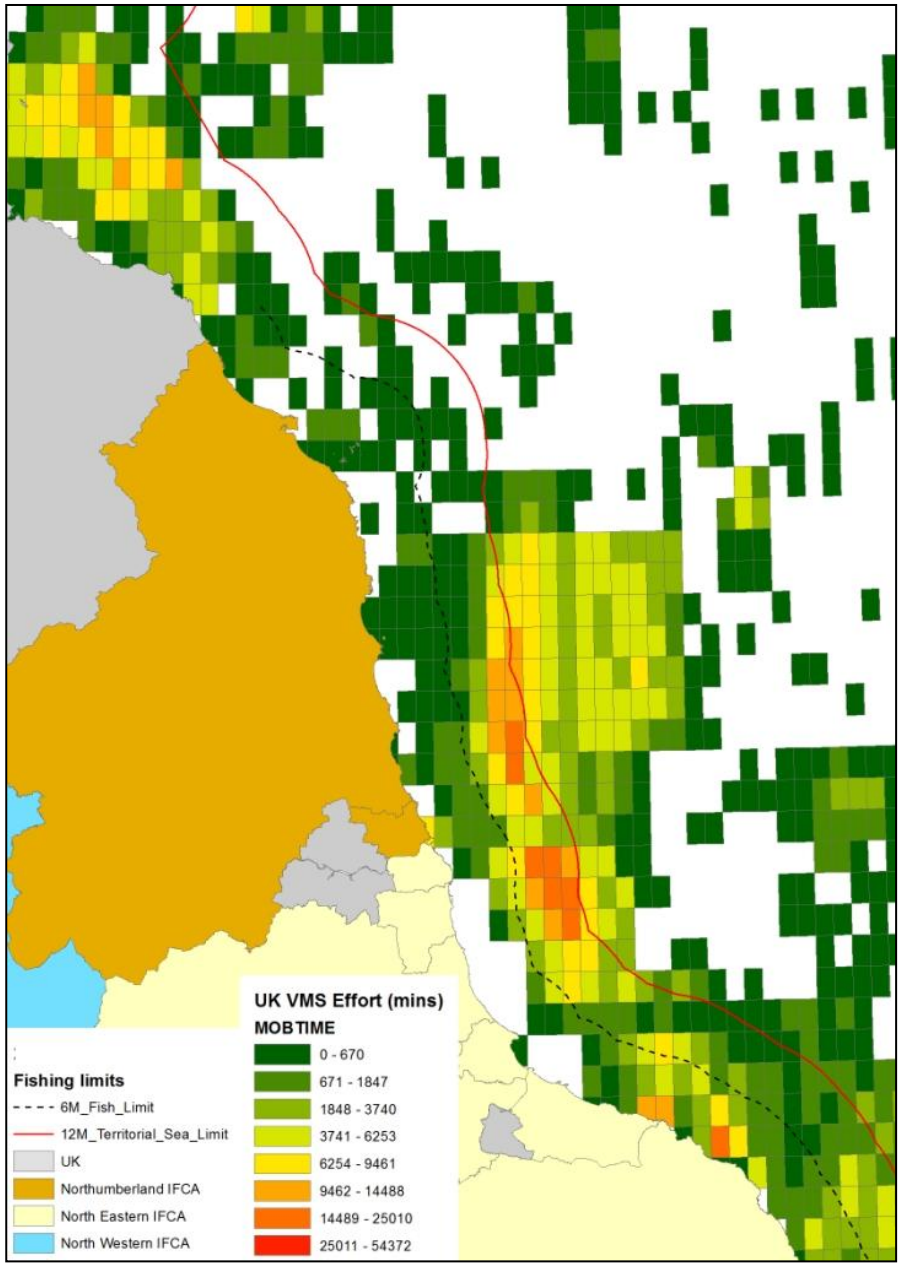


Figure 5.56: VMS effort for all UK mobile vessels ≥15m, 2010 (MMO, 2012)



5.8.1 Identified fisheries

Based on landings data for ICES rectangles that overlap the Northumberland IFCA district the fisheries outlined below are considered important for further assessment:

Finfish fisheries	Demersal trawl (TR1: >100mm)	Demersal trawl (TR2: 80-100mm)	Gill net	Trammel net	Drift net	Handline
Demersal flatfish						
Halibut						
Lemon sole						
Plaice						
Turbot						
Demersal round fish						
Cod						
Haddock						
Monkfish						
Whiting						
Pelagic fish						
Mackerel						

Shellfish fisheries	Dredge	Creel	Demersal trawl	Gill net
Brown crab				
Velvet crab				
Lobster				
Nephrops				
Scallop				

5.8.2 Information and reports

The following information and reports have been received from the Northumberland IFCA, sorted based on relevance to each MSC Principle:

Principle 1:

- Mussel surveys 2007-2012
- Lobster V-Notching Reports 2008-2011

Principle 2:

- Northumberland Biodiversity Action Plan
- Northumberland IFCA Environment Risk Register
- Coastal Birds Species Action Plan

Principle 3:

- Northumberland IFCA Byelaws
- Northumberland IFCA Annual Plan 2012-13
- Joint Working Arrangement for Northumberland IFCA, Natural England, Marine Management Organisation and the Environment Agency 2011-12
- Northumberland IFCA Enforcement Risk Register, 2011

5.9 Southern

Figure 5.57: ICES rectangles overlapping IFCA

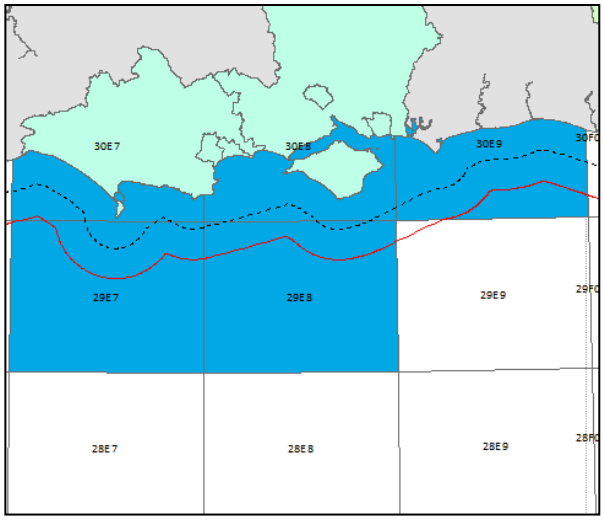
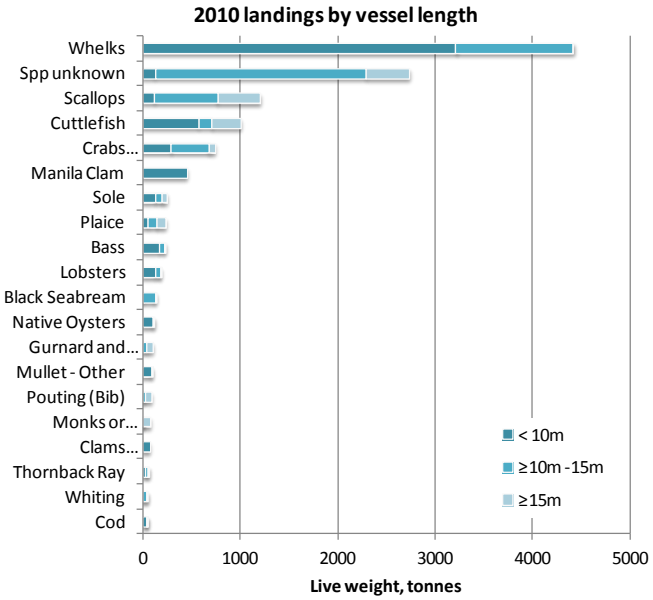


Figure 5.58: Landings by species and vessel length



The figures present landings from the ICES statistical rectangles that overlap the Southern IFCA district, as illustrated in Figure 5.57. Key species landed from this area include sole, scallops, whelks, lobster, cuttlefish, brown crab and bass. Landings from regulating and several orders (therefore including the significant Poole Harbour oyster clam, mussel and cockle fishery) are not reflected in this MMO derived data.

Landings in 2010 were dominated by whelk, with majority taken by under 10m vessels. While scallops and cuttlefish are predominately taken by vessels under 15m, landings are also recorded by over 15m vessels. A manila clam fishery emerged in 2009 and 2010 which is solely targeted by under 10m vessels.

Figure 5.59: Landings value (top) and weight (bottom) by species for 2006-2010 (MMO, 2012)

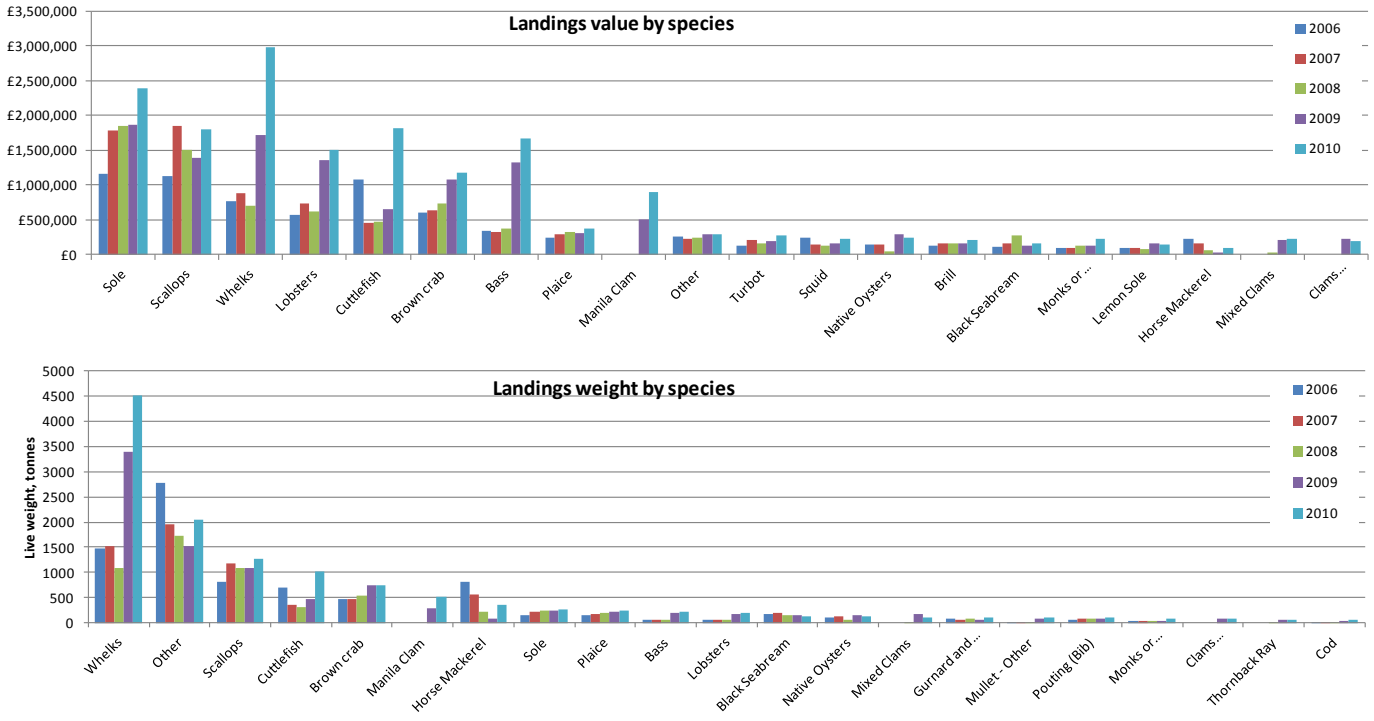
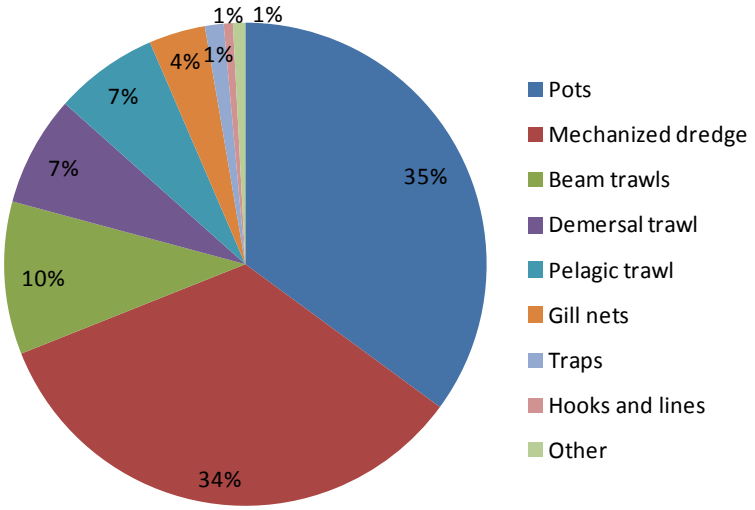


Figure 5.60: Landings by gear type



The figure to the left presents landings by weight (amalgamated from 2006-2010) to illustrate proportion of landings from Southern inshore ICES rectangles by gear type.

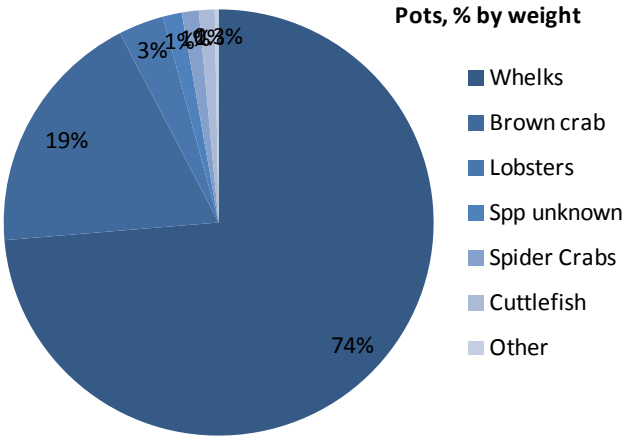
The figures below present species by gear type on the same basis.

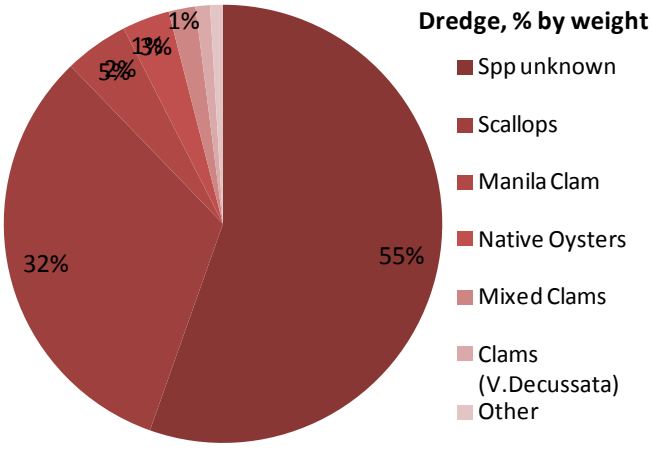
The highest proportion of landings is taken by potters targeting whelks, brown crab and lobster.

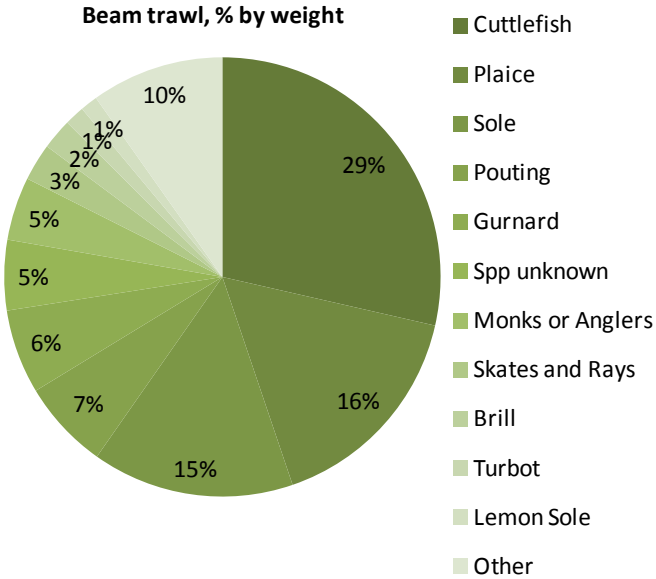
Scallops, manila clam and native oysters form the majority of the catch landed by dredgers.

Cuttlefish are taken by both beam trawl and demersal trawl, together with a range of demersal species including plaice, sole, pouting, gurnard, seabream, bass and squid.

Figure 5.61: Landings for top four gears indicating proportion of species landed by weight







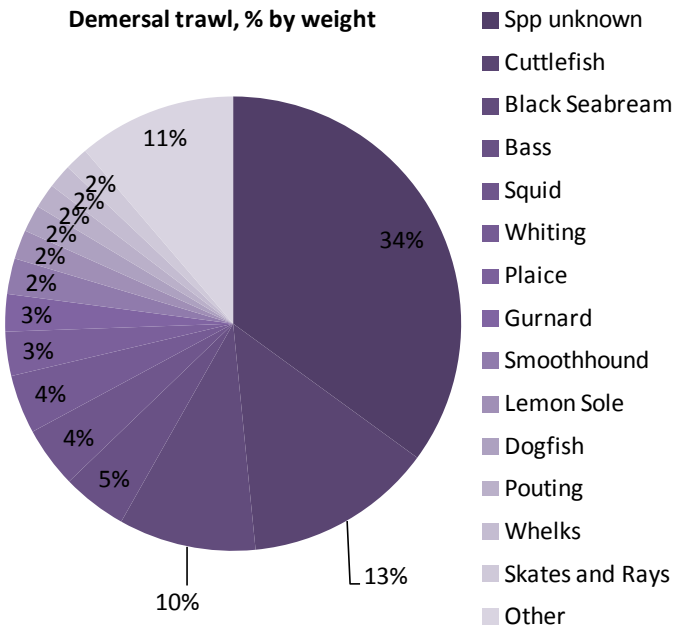


Figure 5.62: Surveillance data, 2007-2011 (MMO, 2012)

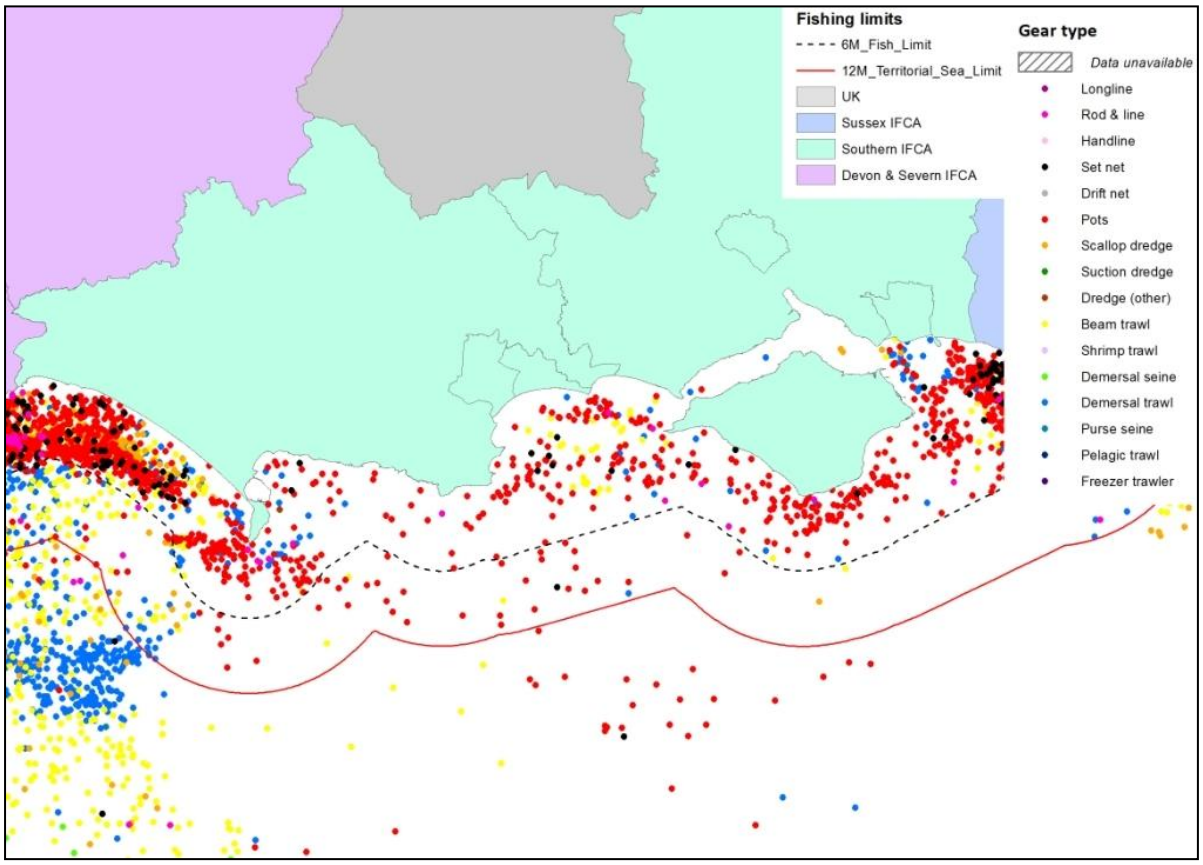
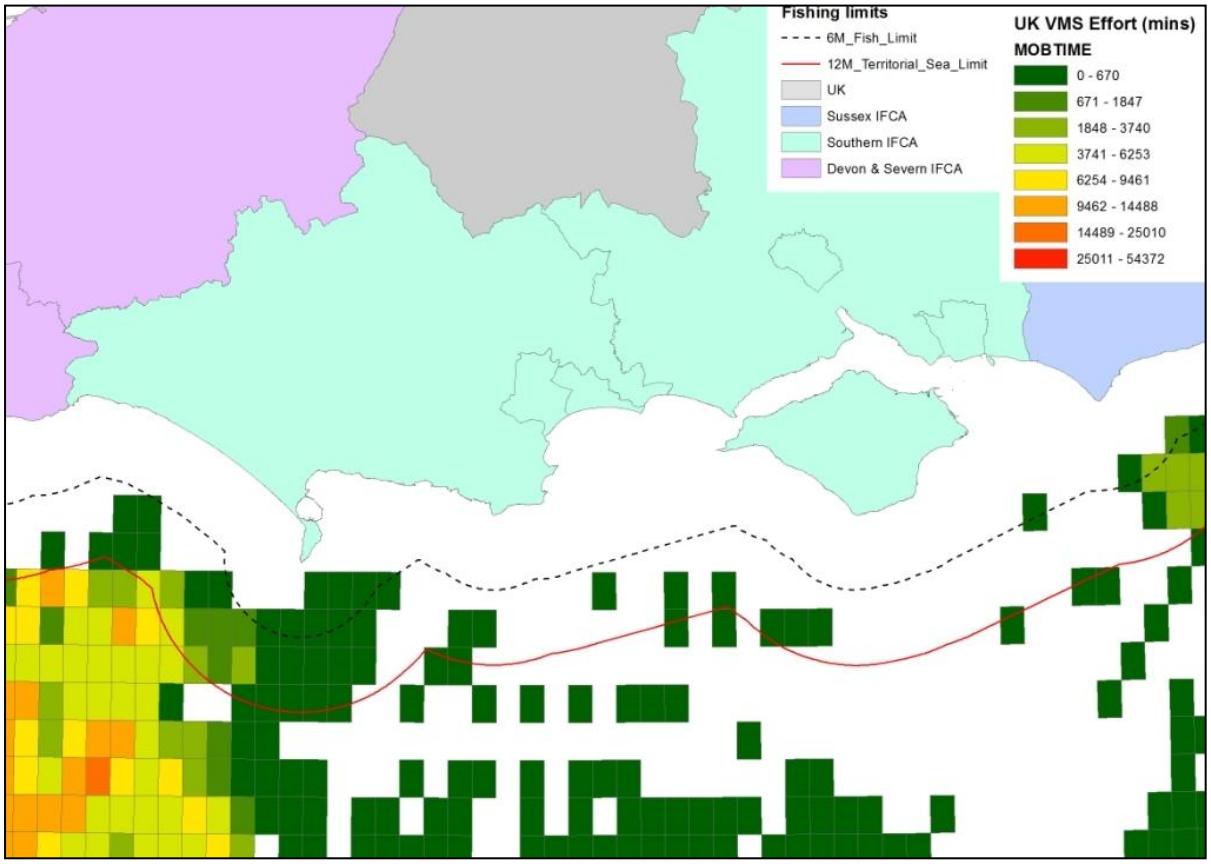


Figure 5.63: VMS effort for all UK mobile vessels ≥15m, 2010 (MMO, 2012)



5.9.1 Identified fisheries

Based on landings data for ICES rectangles that overlap the Southern IFCA district the fisheries outlined below are considered important for further assessment:

Finfish fisheries	Demersal trawl (TR1: >100mm)	Demersal trawl (TR2: 80-100mm)	Beam trawl	Dredge	Gill net	Trammel net	Hooks & line
Demersal flatfish							
Brill	■	■	■	■	■	■	
Lemon sole	■	■	■				
Plaice	■	■	■		■	■	
Sole	■	■	■	■	■	■	
Turbot	■	■	■	■	■	■	
Demersal round fish							
Bass	■		■		■	■	■
Bream	■		■		■		
Monkfish	■	■	■	■	■		
Grey mullet	■		■		■		■

Shellfish fisheries	Mechanised dredge	Creel	Whelk pot	Trap	Hand collection	Demersal trawl	Beam trawl	Gill net
Carpet shell clam	■							
Manila clam	■							
Cockle	■				■			
Mussel	■							
Native oyster	■				■			
Scallop	■				■	■	■	
Cuttlefish		■		■		■	■	■
Squid						■	■	
Brown crab		■					■	■
Lobster		■						■
Whelk			■					
Periwinkle					■			

5.9.2 Information and reports

The following information and reports have been received from the Southern IFCA, sorted based on relevance to each MSC Principle:

Principle 3:

- Southern IFCA Byelaws
- Southern IFCA Annual Plan 2012-2013
- Southern IFCA Annual Research Plan 2012
- Southern IFCA Strategic Research Plan 2012-2015

5.10 Sussex

Figure 5.64: ICES rectangles overlapping IFCA

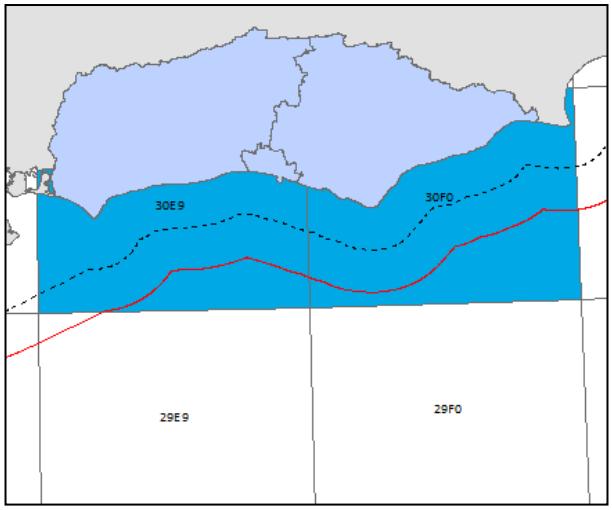
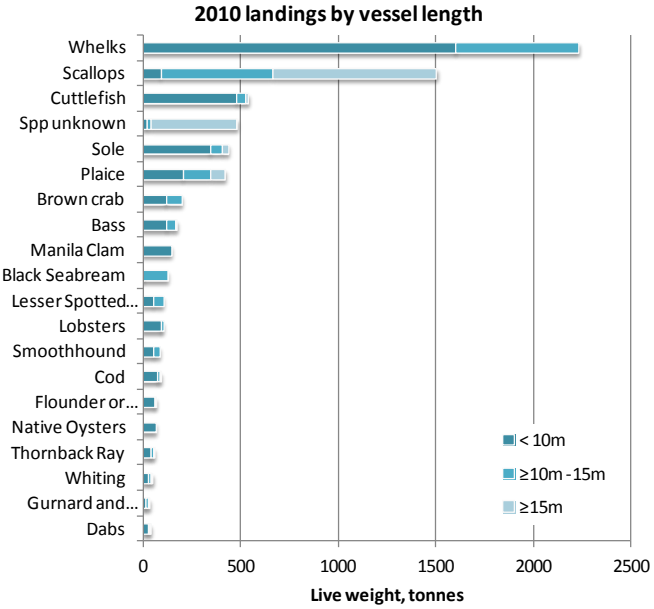


Figure 5.65: Landings by species and vessel length



The figures present landings from the ICES statistical rectangles that overlap the Sussex IFCA district, as illustrated in Figure 5.64. Key species landed from this area include sole, scallops, whelks, bass, plaice, lobster and cuttlefish.

Landings by weight in 2010 were dominated by whelks, with majority taken by under 10m vessels. Scallops are predominately targeted by vessels >10m, while cuttlefish, sole and plaice are largely taken by under 10m vessels.

Landings have grown considerable across 2009-2010, compared to 2008 figures; largely due to increased landings of sole, scallops, whelk and bass.

Figure 5.66: Landings value (top) and weight (bottom) by species for 2006-2010 (MMO, 2012)

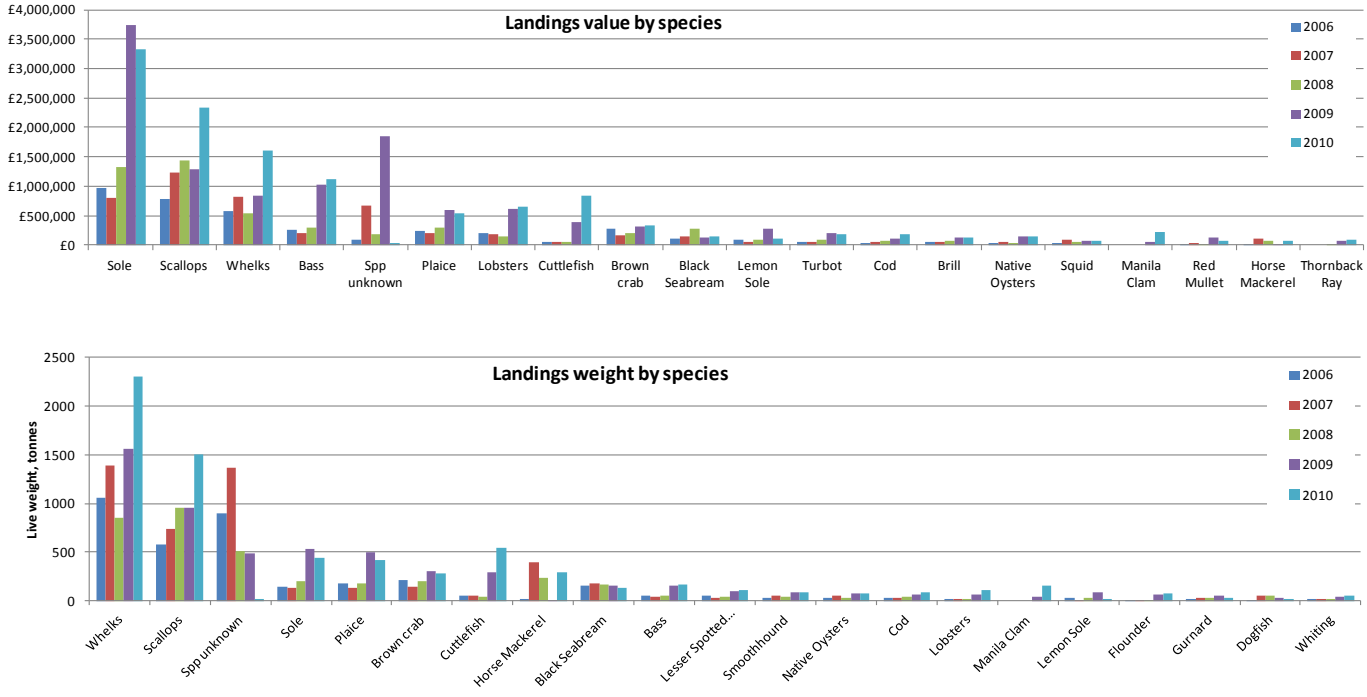
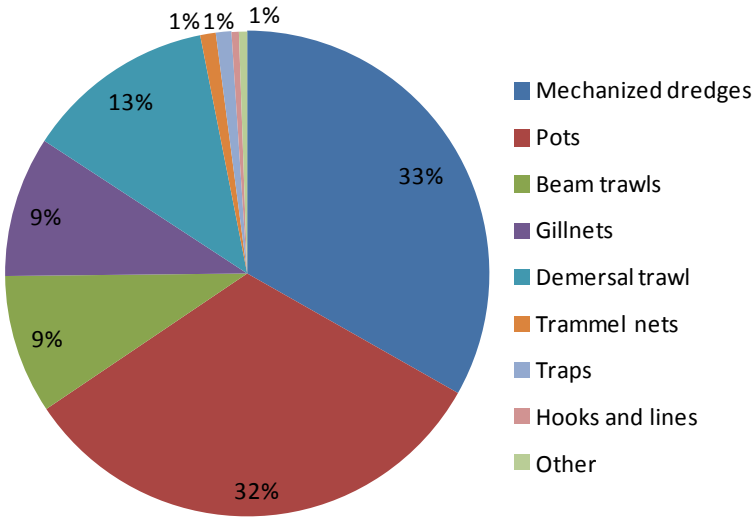


Figure 5.67: Landings by gear type



The figure to the left presents landings by weight (amalgamated from 2006-2010) to illustrate proportion of landings from Sussex inshore ICES rectangles by gear type.

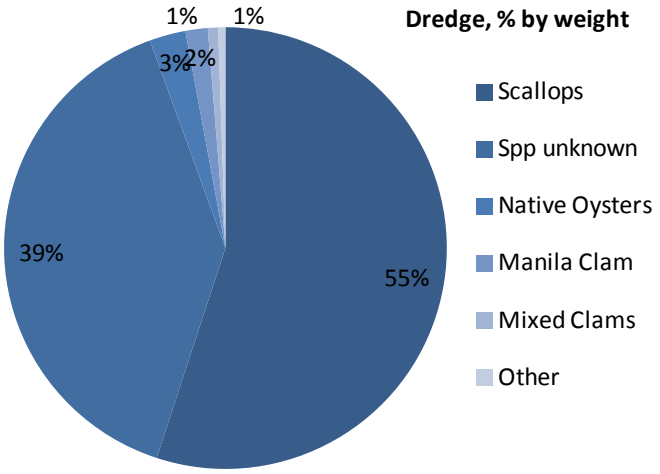
The figures below present species by gear type on the same basis.

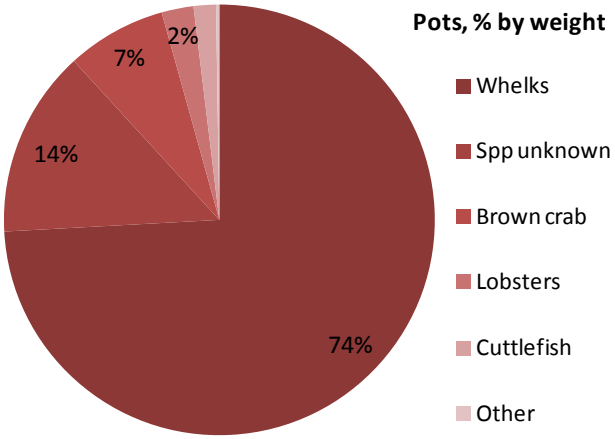
The highest proportion of landings is taken by dredge targeting scallops and native oysters.

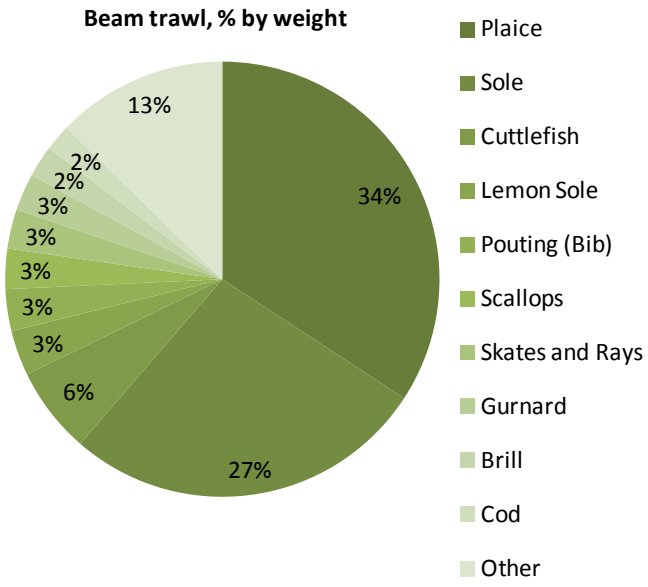
Pots predominately land whelks, with a separate pot fishery for brown crab and lobster.

Landings by beam trawl and gill nets are mixed although predominately target sole and plaice, and cuttlefish, taking retained species of lemon sole, bass, smoothhound and rays. A surprising quantity of whelks is also taken by the gill net fleet.

Figure 5.68: Landings for top four gears indicating proportion of species landed by weight







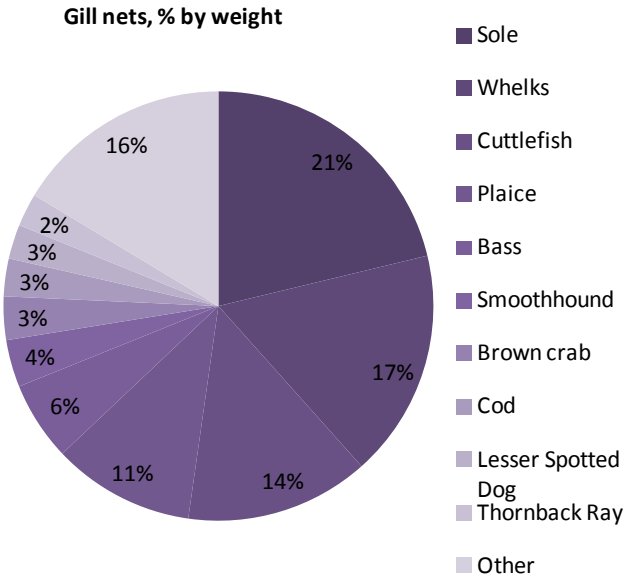


Figure 5.69: Surveillance data, 2007-2011 (MMO, 2012)

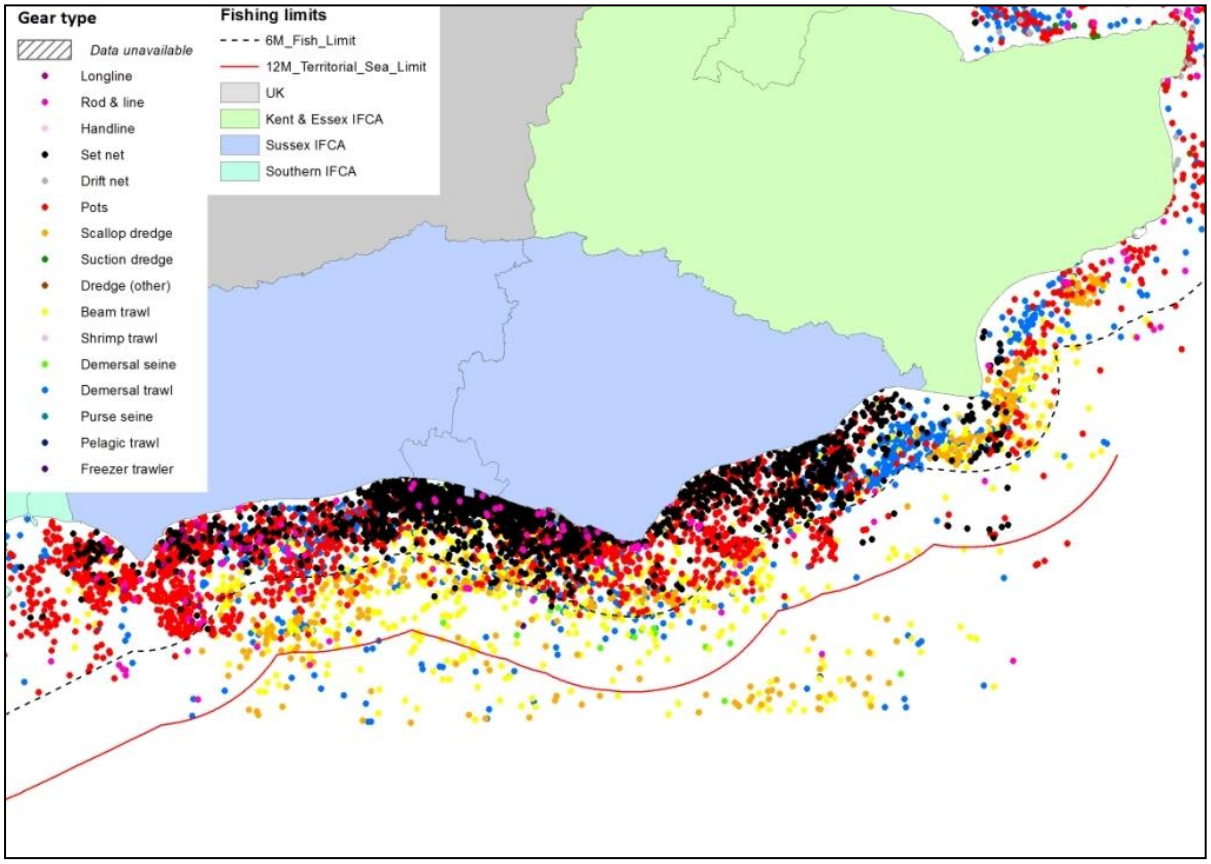
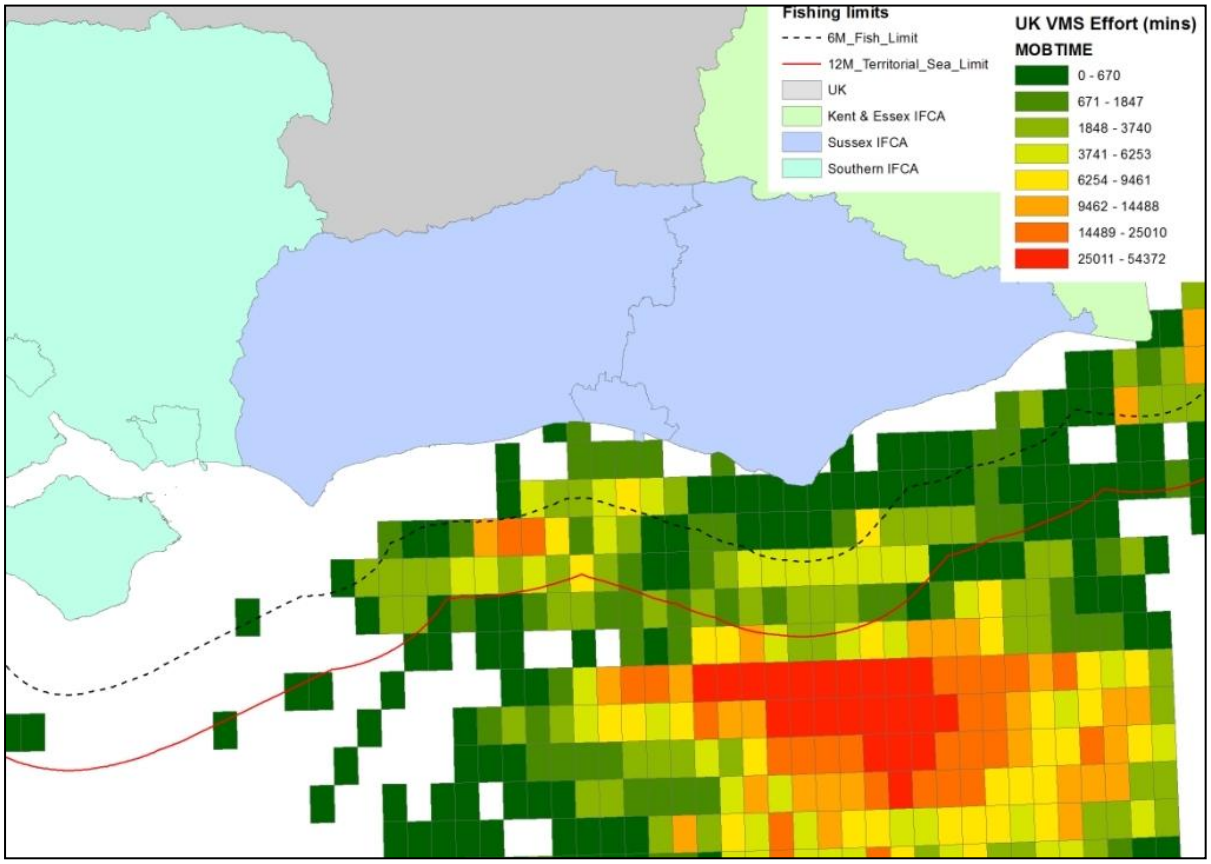


Figure 5.70: VMS effort for all UK mobile vessels ≥15m, 2010 (MMO, 2012)



5.10.1 Identified fisheries

Based on landings data for ICES rectangles that overlap the Sussex IFCA district the fisheries outlined below are considered important for further assessment:

Finfish fisheries	Demersal trawl (TR1: >100mm)	Demersal trawl (TR2: 80-100mm)	Beam trawl	Dredge	Gill net	Trammel net	Drift net	Hooks & line
Demersal flatfish								
Brill	■	■	■	■	■	■		
Lemon sole	■	■	■					
Plaice	■	■	■		■	■		
Sole	■	■	■	■	■	■	■	
Turbot	■	■	■	■	■	■		
Demersal round fish								
Bass	■		■		■	■	■	■
Bream	■		■		■			
Cod	■	■	■		■	■	■	
Red mullet	■	■	■		■			
Elasmobranch								
Thornback ray	■	■	■		■	■	■	

Shellfish fisheries	Mechanised dredge	Creel	Whelk pot	Trap	Hand collection	Demersal trawl	Beam trawl	Gill net
Carpet shell clam	■							
Manila clam	■							
Native oyster	■				■			
Scallop	■				■	■	■	
Cuttlefish		■		■		■	■	■
Squid						■	■	
Brown crab		■					■	■
Lobster		■						■
Whelk			■					■

5.10.2 Information and reports

The Navigating the Future Stage One Report released in August 2009 summarises the data collected under the project remit and goes on to recommend which fisheries are best suited to the Stage Two

gap analysis phase. Key trends were analysed over the baseline period from 2003-2008. The Navigating the Future Stage 1 report highlighted key fisheries in the Sussex district based both on value and landing weights. Commercial fishing ports within Sussex were also emphasised and also highlighted the value of the landings for each port. This data alongside the common fishing methods used in Sussex was integral in bringing together recommendations for which key fisheries would benefit from the Stage Two pre-assessment stage.

The Navigating the Future pilot was a partnership initiative led by Sussex SFC and a non-technical summary can be accessed by the following link:

http://www.sussex-ifca.gov.uk/repository/Navigating_the_Future.pdf

Further information regarding Navigating the Future can be found on the Sussex IFCA website. All three Navigating the Future stage reports are available alongside information on Sussex IFCA's intention to incorporate the findings in annual management plans.

- Stage One presents a fishery analysis of Sussex inshore fisheries looking at species profiles, landing values, biological attributes and more in the following report: http://www.sussex-ifca.gov.uk/repository/IFSP_Stage1_report.pdf
- Stage Two is the gap analysis of Sussex inshore fisheries against an MSC pre-assessment template. This includes reviewing fisheries covering 16 species and 11 types of gear against impacts on stock, ecosystem and management. The Stage Two report can be found at the following link: http://www.sussex-ifca.gov.uk/repository/IFSP_Stage2_report.pdf
- Stage Three utilises the gap analysis undertaken in Stage Two of Navigating the future and focusses on detailing and costing a programme of remedial work including:
    - Presenting a Fisheries Management Plan for Sussex IFCA
    - Looking to address issues of relevance against the MSC assessment template including stock status, ecosystem impacts and management measures.
    - Developing bespoke plans which focus on improving the sustainability credentials of Sussex inshore fisheries.

The Stage Three report (Dapling *et al.* 2010) is available via the following link:

http://www.sussex-ifca.gov.uk/repository/IFSP_Stage3_report.pdf

6 Several, Regulating and Hybrid Orders

The UK Sea Fisheries (Shellfish) Act 1967 includes provision to enable the Secretary of State to transfer powers to manage defined shellfish species, within a restricted area to a grantee. There are different types of order contained in the Act, including Regulating Orders, Several Orders and Hybrid Orders. English Several, Regulating and Hybrid Orders are summarised in Table 6.1 for live applications, live orders and ceased orders.

Table 6.1: Summary of English Several, Regulating and Hybrid Orders (Defra, 2012)

Type of Order	Name	Species	Location	Owner
Live applications				
Hybrid	Morecambe Bay Hybrid Order	All molluscan shellfish	Morecambe Bay	North Western IFCA
Several	Brancaster Several Order	Pacific Oysters (triploid)	Brancaster	Brancaster Oystermen's Society
Several	River Camel Mussel and Oyster Fishery Order 2011	Mussels and Oysters	River Camel (Padstow/Rock)	Private
Several	River Roach Several Order	Natives/Gigas/Clams	River Roach, Essex	Kent and Essex IFCA
Several	Walney Channel (Barrow in Furness) Several Order	Mussels	North Walney, Barrow in Furness	Private
Live Orders				
Hybrid	Poole	Natives/Gigas/Clams/Mussels/Cockles	Poole, Dorset	Southern IFCA
Hybrid	The Wash	Cockles & Mussels	The Wash, Eastern England	Eastern Sea Fisheries Joint Committee
Hybrid	Waddeton	Gigas/Mussels	Waddeton, Devon	Devon SFC
Regulating	Dee Estuary	Mussels & Cockles	River Dee, Merseyside	Environment Agency Wales
Regulating	River Teign	Mussels	River Teign, Devon	Teign Musselmen's Society
Regulating	Thames Estuary	Cockles	Thames Estuary	Kent and Essex IFCA
Regulating	Truro Port	Natives	Truro, Devon	Carrick District Council
Several	Blakeney	Mussels	Blakeney, Gloucs	Private
Several	Calshot	Oysters	Calshot, Hampshire	Calshot Oyster Fishermen Ltd
Several	Horsey Island	Oysters	Horsey Island, Essex	Private
Several	Stanswood Bay	Natives	Stanswood Bay, Hampshire	Stanswood Bay Oystermen Ltd.
Several	Taw	Mussels	River Taw, North Devon	South West Water
Several	Tollesbury & Mersea	Natives & Gigas	Tollesbury and Mersea - Essex	The Tollesbury & Mersea Native Oyster Fishery Co. Ltd.
Old (ceased Orders) - limited information available				
Regulating	Solent			
Several	Emsworth		Emsworth channel, Hampshire	
Several	Exe		River Exe, Devon	Devon & Severn IFCA
Several	Graveney		Swale, Whitstable, Kent	The Whitstable Shellfish Company
Several	Humber	Cockles	Humberside, East	

Type of Order	Name	Species	Location	Owner
			England	
Several	Hunstanton			
Several	Liverpool Bay Several Order	Razor clams	Liverpool Bay, Merseyside	Private
Several	Lyme Bay Mussel Farm	Mussels	Lyme Bay, Dorset	Offshore Shellfish Ltd
Several	Portland Harbour		Portland, Dorset	
Several	Stour	Mussels	Essex	
Several	Whitstable			The Whitstable Shellfish Company
Several	Wirral			

A Regulating Order is granted to encourage the maintenance and improved regulation of an existing shellfish fishery, in particular one which may be at risk from over-exploitation. In effect it transfers power to manage a local, geographically restricted shellfish fishery from the state, to a local grantee. Typically, a regulating order is time restricted, and will only be granted initially, and renewed, once it can be demonstrated that it is non-discriminatory, broadly supported and that the grantee, who will take over management, is competent to do so. Should a grantee fail in its obligation to manage the shellfish resources appropriately, or manage in a way which is discriminatory, the government may revoke the regulating order and return management of shellfish resources in those waters to the state. A regulating order does not provide the grantee themselves with fishing rights, but instead gives the power to the Grantees to issue fishing licences and exclude unlicensed persons.

By contrast a Several Order bestows ownership of the shellfish within a defined area on the Grantee, effectively transferring a property right that may be leased or transferred. This enables a grantee to establish or enhance shellfish beds or collect, move or deposit shellfish within the defined area. In short, a Several Order enables the grantee to invest in the enhancement of a fishery in the knowledge that they retain control of the resulting harvest.

Finally, the Act also contains provision for Hybrid Orders, which enables the establishment of a regulated fishery, containing a designated several fishery within its boundary.

DEFRA have stated that in the future both Regulating Orders and Hybrid Orders will only be granted to IFCAs, or other public bodies that regulate fishing activity in certain areas (such as the Environment Agency). None of the orders above affect the powers of the state, or even the EU to manage other fish stocks, marine conservation interests, or other marine industries in the area of the order.

In 2010 there were seven Several fisheries, three Regulated fisheries and three Hybrid Order fisheries in England with total production values at £9.6 million. Table 6.2 presents production/landings of the various species produced from these orders in England in 2010, based on data from Annual Returns (Cefas, 2012). There is some uncertainty to the degree in which these figures are incorporated into MMO national statistics.

Table 6.2: Production / Landings (tonnes) of shellfish from Fishery Orders in England in 2010 (Cefas, 2012)

Species	Several	Regulating	Hybrid	Total	Value
Cockles		11,526	2,482	14,008	£7,916,688
Mussels	49	102	1,051	1,202	£631,000
Pacific oyster	40	20	255	315	£582,000
Calms	0.5		75	75.5	£383,000
Native oyster	5	31	1	37	£113,000
Total				**15,637.5 tonnes**	**£9.6 million**

7 Selection of Fisheries for Stage 2 Assessment

In assessing which species should go forward to Stage 2 of the pre-assessment the following criteria have been explored:

- How valuable is the fishery based on volume and value of national and inshore landings (based on ICES rectangles that overlap IFCA districts) in 2010?
- Is part of the fishery already certified?
- Is the species an important retained species in certain target fisheries?
- Has the fishery been important during the past five consecutive years?
- Is the fishery important to specific IFCAs?
- Is there potential for future fisheries to be developed for this species?

Stage 1 has not selected fisheries based on Principles 1, 2 and 3 criterion (i.e. the likelihood to pass or fail a future MSC assessment). This will be assessed in Stage 2.

In terms of value, species with landings worth less than £100,000 have generally not been selected. Although exceptions exist in the following circumstances:

- The species is only important to one or two areas;
- The species is nationally important (and landed into English ports from non-inshore ICES rectangles);
- The species is an important retained species in other target fisheries; or
- Landings of the species have had significant growth in recent years i.e. it is an emerging or important future fishery.

It is recommended that the species listed in Table 7.1 go forward for further investigation in this report (Stage 1) and Stage 2 of the MSC pre-assessment. Table 7.2 outlines justifications for why certain species are not being taken forward. The team remain open to discussion on these and any other species.

Table 7.1: Proposed species for further pre-assessment (*inshore refers to landings from ICES rectangles that overlap IFCA districts)

Common name	Scientific name	Justification*
Finfish		
Demersal flatfish		
Brill	*Scopthalmus rhombus*	Value of > £1 million landed from inshore areas into English ports in 2010; important retained species in flatfish fisheries.
Dab	*Limanda limanda*	Landings value of ~£65k from inshore areas into English ports in 2010; however is a retained species in a number of fisheries and recent trends show increasing landings. Majority of landings are from Devon and Severn IFCA.
Flounder	*Platichthys flesus*	Landings value of ~£40k from inshore areas into English ports in 2010; however is a retained species in a number of fisheries and recent trends show increasing landings. Majority of landings are from Kent and Essex and Sussex IFCAs.
Halibut	*Hippoglossus hippoglossus*	Landings value of ~£85k from inshore areas into English ports in 2010; however is a retained species in a number of fisheries and 59% of landings into England are from inshore areas.
Lemon sole	*Microstomus kitt*	Value of > £4.4 million landed from inshore areas into English ports in 2010; second most valuable flatfish species (behind sole).
Megrim	*Lepidorhombus spp*	Value of ~£500k landed from inshore areas into English ports in 2010; more important for offshore landings which make up 66% of landings

Common name	Scientific name	Justification*
		into England.
Plaice	*Pleuronectes platessa*	Value of > £1.9 million landed from inshore areas into English ports in 2010; third most valuable flatfish species and important retained species in sole fishery.
Sole	*Solea solea*	Value of > £11.6 million landed from inshore areas into English ports in 2010; one of the most commercially important species; Hastings fisheries are currently certified and English Channel beam trawl fishery is in assessment.
Turbot	*Scophthalmus maximus*	Value of > £1.7 million landed from inshore areas into English ports in 2010; important retained species in a number of fisheries.
Witch	*Glyptocephalus cynoglossus*	Small value to inshore areas (~£5k), however important nationally with 80% of landings from offshore locations. Majority of landings are by >15m vessels.
Demersal round fish		
Bass	*Dicentrarchus labrax*	Value of > £4.3 million landed from inshore areas into English ports in 2010; significantly more important to inshore fisheries than offshore; species is currently in assessment in Bristol Channel.
Bream	*Pagellus spp.*	Value of ~£225k landed from inshore areas into English ports in 2010; majority of landings from Southern and Sussex IFCAs.
Cod	*Gadus morhua*	Value of > £2.4 million landed from inshore areas into English ports in 2010; important inshore species with 82% of landings into England from inshore area.
Gurnard	*Triglidae spp.*	Value of ~£418k landed from inshore areas into English ports in 2010; important in Devon and Severn, Cornwall and Southern IFCAs; increases in landings by <15m vessels in 2009 and 2010; majority of landings from inshore area (68% of landings into England).
Haddock	*Melanogrammus aeglefinus*	Value of > £1.1 million landed from inshore areas into English ports in 2010; important inshore species with 56% of landings into English ports from inshore area; important to Cornwall, Devon & Severn and North Eastern IFCAs.
Hake	*Merluccius merluccius*	Value of ~£66k landed from inshore areas into English ports in 2010; species much more important to offshore locations which represent 88% of landings into English ports; Majority of landings recorded from Isles of Scilly and Cornwall IFCAs.
John dory	*Zeus faber*	Value of ~£670k landed from inshore areas into English ports in 2010; species important to Cornwall and Devon & Severn IFCAs.
Ling	*Molva molva*	Value of ~£175k landed from inshore areas into English ports in 2010; species important to Cornwall and Devon & Severn IFCAs.
Monkfish	*Lophius piscatorius*	Value of > £4.6 million landed from inshore areas into English ports in 2010; important retained species in a number of fisheries; species important to Cornwall and Devon & Severn IFCAs.
Grey mullet	*Liza ramada, Liza aurata and Chelon labrosus*	Value of ~£270k landed from inshore areas into English ports in 2010; landings have significantly increased in 2009 and 2010.
Red mullet	*Mullus surmuletus*	Value of ~£517k landed from inshore areas into English ports in 2010; landings have been consistent for past five years; landed across a number of IFCAs.
Pollack	*Pollachius pollachius*	Value of > £1.5 million landed from inshore areas into English ports in 2010; important inshore species with 69% of landings into English ports from inshore area.
Pouting	*Trisopterus luscus*	Value of ~£161k landed from inshore areas into English ports in 2010; majority of landings from Cornwall and Devon & Severn IFCAs.
Saithe	*Pollachius virens*	Low value of ~£12k landed from inshore areas into English ports in 2010; however key offshore species and nationally important.

Common name	Scientific name	Justification*
Whiting	*Merlangius merlangus*	Value of > £1.1 million landed from inshore areas into English ports in 2010; important inshore species with 90% of landings into English ports from inshore area.
Elasmobranch		
Blonde ray	*Raja brachyura*	Combined value of >£2.3 million landed from inshore areas into English ports in 2010; most important species are thornback ray (£930k), blonde ray (£670k) and small-eyed ray (£295k); important to Devon and Severn and Cornwall with Thornback ray also important in Kent and Essex and Eastern IFCAs; species from Bristol Channel fishery are currently in assessment.
Cuckoo ray	*Leucoraja naevus*	
Small-eyed ray	*Raja microocellata*	
Spotted ray	*Raja montagui*	
Thornback ray	*Raja clavata*	
Smoothhound	*Mustelus mustelus*	Value of ~£171k landed from inshore areas into English ports in 2010.
Pelagic fish		
Anchovy	*Engraulis encrasicolus*	Value of ~£240k landed from inshore areas into English ports in 2010; landings from Cornwall and Devon coasts.
Herring	*Clupea harengus*	Value of ~£117k landed from inshore areas into English ports in 2010; a number of Scottish and UK fisheries are certified.
Horse mackerel	*Trachurus trachurus*	Value of ~£310k landed from inshore areas into English ports in 2010; 20% of landings into England are from inshore area; majority of landings from Kent and Essex, Southern, Sussex and Devon and Severn IFCAs.
Mackerel	*Scomber scombrus*	Value of >£1.3 million landed from inshore areas into English ports in 2010; Scottish and UK fisheries are certified and a small-scale Hastings fishery was certified (but certification expired in Nov 2011).
Pilchard	*Sardina pilchardus*	Value of ~£611k landed from inshore areas into English ports in 2010; 50% of landings into England are from inshore area; Cornish ring and drift net fishery is certified.
Sprat	*Sprattus sprattus*	Low landings in 2010, but worth ~£500k in 2009; landed by vessels >15m in length and likely to be a more important offshore species.
Shellfish		
Bivalve		
Carpet shell clam	*Tapes philippinarum*	Value of ~£200k landed from inshore areas into English ports in 2010; only landed into Southern IFCA, no landings recorded pre-2009, therefore an emerging fishery.
Manila clam	*Mercenaria mercenaria*	Value of ~£900k landed from inshore areas into English ports in 2010; only landed into Southern and Sussex IFCAs, no landings recorded pre-2009, therefore an emerging fishery for this invasive species
Cockle	*Cerastoderma edule*	Known to be a key commercially important shellfish species in England; landings statistics only show data for dredged fisheries, not hand raked which are collated via Shellfish Returns (therefore figures under-estimate value); value of >£7.9 million produced from Regulating, Several and Hybrid Order fisheries in 2010; UK certified fisheries include Dee Estuary and the Burry Inlet.
Mussel	*Mytilus edulis*	Known to be a key commercially important shellfish species in England; value of ~£631k produced from Regulating, Several and Hybrid Order fisheries in 2010; UK certified fisheries include Exmouth hydraulic jet elevator fishery, Shetland and Scotland rope grown mussels and North Menai Strait dredge fishery.
Native oyster	*Ostrea edulis*	Value of ~£317k landed from inshore areas into English ports in 2010; majority landed into Southern and Sussex IFCAs; Blackwater native oyster fishery currently in assessment process.
Scallop	*Pecten maximus*	Value of > £9.2 million landed from inshore areas into English ports in

Common name	Scientific name	Justification*
		2010; third most valuable shellfish species.
Pacific oyster	*Crassostrea gigas*	Not represented within landing statistics, but known to be an important commercial fishery in England. Value of ~£582k produced from Regulating, Several and Hybrid Order fisheries in 2010
Razorshell	*Littorina littorea*	Not represented within landing statistics, but considered to be an emerging fishery.
Cephalopod		
Cuttlefish	*Sepia officinalis*	Value of > £5.5 million landed from inshore areas into English ports in 2010; consistently important landings across past five years.
Squid	*Loligo spp.*	Value of > £1.5 million landed from inshore areas into English ports in 2010; consistently important landings across past five years; 47% of landings into England ports are from inshore areas.
Crustacean		
Brown crab	*Cancer pagurus*	Value of > £10.6 million landed from inshore areas into English ports in 2010; second most valuable shellfish species.
Green/shore crab	*Carcinus maenus*	No landings recorded; however green crab is currently exploited in some areas around the UK and is taken with brown crab and lobster fisheries. May become important in the future.
Spider crab	*Maia squinado*	Value of ~£538k landed from inshore areas into English ports in 2010; majority landed into Cornwall and Devon and Severn IFCAs; landings have significantly increased in 2009-2010 compared to 2006-2008.
Velvet crab	*Liocarcinus puber*	Value of ~£112k landed from inshore areas into English ports in 2010; important retained catch in brown crab fishery.
Crawfish	*Palinurus elephas*	Value of ~£186k landed from inshore areas into English ports in 2010; majority landed into Cornwall IFCA, with some also into Isles of Scilly; landings have significantly increased in 2009-2010 compared to 2006-2008.
Lobster	*Homarus gammarus*	Value of > £11.6 million landed from inshore areas into English ports in 2010; most valuable shellfish species.
Nephrops	*Nephrops norvegicus*	Value of > £2.7 million landed from inshore areas into English ports in 2010; 40% of landings into English ports from inshore area.
Brown shrimp	*Crangon crangon/vulgaris*	Value of > £1.6 million landed from inshore areas into English ports in 2010; specifically important to Eastern IFCA district.
Gastropod		
Whelk	*Buccinum undatum*	Value of > £5.5 million landed from inshore areas into English ports in 2010; becoming more important with higher landings in 2009-2010 compared to 2006-2008.
Periwinkle	*Ensis spp.*	Not represented within landing statistics, but thought to be an important commercial fishery in England.

Table 7.2: Justification for certain species not being taken forward

Common name	Scientific name	Justification
Finfish		
Ballan Wrasse	*Labrus bergylta*	Value of <£100 landed from inshore areas into English ports in 2010
Blue whiting	*Micromesistius poutassou*	Landed by large vessels operating offshore, with no inshore overlap.
Conger eel	*Conger conger*	Value of <£90k landed from inshore areas into English ports in 2010
Eel	*Anguilla anguilla*	Value of <£100 landed from inshore areas into English ports in 2010
Garfish	*Belone belone*	Value of <£1000 landed from inshore areas into English ports in 2010

Common name	Scientific name	Justification
Greater Forked Beard	*Phycis blennoides*	Value of <£100 landed from inshore areas into English ports in 2010
Greater weever	*Trachinus draco*	Value of <£1000 landed from inshore areas into English ports in 2010
Lesser spotted dogfish	*Scyliorhinus canicula*	Value of <£40k landed from inshore areas into English ports in 2010
Nurse/huss dogfish	*Scyliorhinus stellaris*	Value of <£60k landed from inshore areas into English ports in 2010
Rockling	*Gaidropsarus spp*	Value of <£100 landed from inshore areas into English ports in 2010
Salmon	*Salmo salar*	Not under the management jurisdiction of MMO / IFCAs and therefore not included in assessment
Sand sole	*Pegusa lascaris*	Value of <£60k landed from inshore areas into English ports in 2010
Sandeel	*Ammodytes spp.*	Fishmeal species therefore not included in assessment
Sea trout	*Salmo trutta*	Not under the management jurisdiction of MMO / IFCAs and therefore not included in assessment
Shad	*Alosa spp*	Value of <£1000 landed from inshore areas into English ports in 2010
Silver smelt	*Osmerus eperlanus*	No landings recorded
Spurdog	*Squalus acanthias*	Value of <£3000 landed from inshore areas into English ports in 2010. Landings banned based on EC Regulation 23/2010
Tope	*Galeorhinus galeus*	Value of <£7000 landed from inshore areas into English ports in 2010
Triggerfish	*Balistidae spp*	Value of <£500 landed from inshore areas into English ports in 2010
Wrasse	*Labridae spp*	Value of <£6k landed from inshore areas into English ports in 2010
Shellfish		
American clam	*Mercenaria mercenaria*	Value of <£16k landed from inshore areas into English ports in 2010
Deep sea prawn	*Pandulus borealis*	No landings recorded in inshore areas
English prawn	*Palaemon (leander) serratus*	Value of <£20k landed from inshore areas into English ports in 2010
Octopus	*Octopus vulgaris*	Value of <£40k landed from inshore areas into English ports in 2010
Pink shrimp	*Pandalus montagui*	No landings recorded
Queen scallop	*Chlamys opercularis*	No landings recorded

A summary of the fisheries (species and gear combinations) being taken forward to Stage 2 assessment is provided for finfish in and shellfish in Table 7.3 and Table 7.4.

Table 7.3: Finfish fisheries for Stage 2 assessment

Finfish fisheries	Demersal trawl (TR1: >100mm)	Demersal trawl (TR2: 80-100mm)	Beam trawl	Dredge	Pelagic trawl	Gill net	Trammel net	Encircling net	Drift net	Long line	Handline and pole-line	Hooks & line	Creel
Demersal flatfish													
Brill	■	■	■	■		■	■						
Dab	■	■	■			■	■						
Flounder	■		■			■	■						
Halibut	■	■											
Lemon sole	■	■	■										
Megrim	■		■			■							
Plaice	■	■	■			■	■						
Sole	■	■	■	■		■	■		■				
Turbot	■	■	■	■		■	■						
Witch	■	■	■										
Demersal round fish													
Bass	■		■		■	■	■		■		■	■	
Bream	■		■			■							
Cod	■	■	■			■	■		■	■			■
Gurnard	■	■	■			■							
Haddock	■	■	■			■							
Hake	■	■	■			■							
John dory	■		■			■							
Ling	■	■	■			■							
Monkfish	■	■	■	■		■							
Grey mullet	■		■			■			■		■	■	
Red mullet	■	■	■			■							
Pollack	■		■			■					■	■	
Pouting	■		■			■							
Saithe	■	■				■					■		
Whiting	■	■	■			■							
Elasmobranch													
Blonde ray	■		■			■				■			
Cuckoo ray	■	■	■			■							
Small-eyed ray	■		■			■							
Spotted ray	■		■	■		■							
Thornback ray	■	■	■			■	■		■	■			
Smoothhound	■	■	■			■	■		■	■			

Finfish fisheries	Demersal trawl (TR1: >100mm)	Demersal trawl (TR2: 80-100mm)	Beam trawl	Dredge	Pelagic trawl	Gill net	Trammel net	Encircling net	Drift net	Long line	Handline and pole-line	Hooks & line	Creel
Pelagic fish													
Anchovy								■					
Herring					■	■		■	■	■	■	■	
Horse mackerel					■	■					■		
Mackerel					■	■					■	■	■
Pilchard						■		■	■		■		
Sprat					■								

Table 7.4: Shellfish fisheries for Stage 2 assessment

Shellfish fisheries	Mechanised dredge	Creel	Whelk pot	Trap	Hand collection	Demersal trawl	Beam trawl	Gill net
Bivalve								
Carpet shell clam	■							
Manila clam	■	■	■					
Cockle	■				■	■	■	
Mussel	■							
Native oyster	■	■	■		■			
Scallop	■				■	■	■	
Pacific oyster	■				■			
Razorshell	■				■			
Cephalopod								
Cuttlefish		■		■		■	■	■
Squid						■	■	
Crustacean								
Brown crab		■					■	■
Shore crab		■						
Spider crab		■						■
Velvet crab		■						
Crawfish		■				■	■	■
Lobster		■						■
Nephrops						■		
Brown shrimp							■	
Gastropod								
Whelk			■					■
Periwinkle					■			

8 Individual Species Records

Provided as a separate report.

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Appendix A. Data Strategy

Provided as a separate report.

Appendix B. Data Request to IFCAs

The example below presents the data request submitted to Cornwall IFCA

FOOD CERTIFICATION INTERNATIONAL LTD
Findhorn House, Dochfour Business Centre, Dochgarroch, Inverness, IV3 8GY, Scotland, UK
Tel: +44 (0) 1463 223 039 Fax: +44 (0) 1463 246 380 www.foodcertint.com

Data request submitted to Cornwall IFCA in relation to Project Inshore

Food Certification International (FCI) is currently undertaking Project Inshore, a new initiative led by Seafish. The project will carry out pre-assessments based on the Marine Stewardship Council (MSC) Standard for sustainable fishing and use the results of these to produce tailored sustainability reports for fisheries around the English coast.

You may have already been introduced to Project Inshore by Matt Watson, the English inshore MSC project officer.

To gain a full understanding of the fisheries activities in English IFCA districts and to inform the MSC based assessment, the FCI project team would like to explore the types of data and information that the Cornwall IFCA may be able to provide.

The MSC standard assesses fisheries based on three principles as summarised below:

Principle 1

A fishery must be conducted in a manner that does not lead to over-fishing or depletion of the exploited populations and, for those populations that are depleted, the fishery must be conducted in a manner that demonstrably leads to their recovery.

Principle 2

Fishing operations should allow for the maintenance of the structure, productivity, function and diversity of the ecosystem (including habitat and associated dependent and ecologically related species) on which the fishery depends

Principle 3

The fishery is subject to an effective management system that respects local, national and international laws and standards and incorporates institutional and operational frameworks that require use of the resource to be responsible and sustainable.

The types of data that we require are provided in the table overleaf categorised for each of the MSC principles, as well as for general fisheries activities data. We appreciate that not all IFCAs will necessarily have data on all of these areas. In some areas we have already sought alternative sources of information – for example from the MMO. However the assessment team are keen to get a detailed understanding of the types of data that IFCAs routinely collect and use to inform management decisions.

Information and data may be in the form of excel spreadsheets, stand alone reports or shapefiles for GIS purposes.

Please provide information and data to: Fiona Nimmo fiona@poseidon-consult.com

Table 1: Data request to IFCA

General fisheries activity	• Landing statistics data for IFCA district for period 2007-2011 [NOTE: landings data are being sourced from MMO, but without ICES sub-rectangle detail, if you do not record landings by sub-rectangle then we do not require these statistics]:
	  ○ Year
	  ○ Month
	  ○ Nationality (country of vessel registration)
	  ○ Gear type
	  ○ Vessel length category (e.g. under 10m, 10-12m, 12-15m and over 15m)
	  ○ ICES rectangle
	  ○ ICES sub-rectangle
	  ○ Port of landing
	  ○ Species
	  ○ Weight
	  ○ Value
	• Shellfish Returns data for period 2007-2011
	• Details of landings not covered in official landings records, e.g. hand gathered cockles
	• IFCA collated spatial data for effort by gear type. [NOTE: VMS and surveillance data are being sourced from MMO]
	• Fleet register for active vessels within IFCA district including following details:
	  ○ Licence number
	  ○ Activity: full time, part time, seasonal and/or occasional

Stocks (Principle 1)	• Any local fishery specific management plans • Local stock assessments • Any other biological research • Any local fishery improvement plans
Environment (Principle 2)	• Observer reports – either coordinated at a national or IFCA level – including details of observer coverage and data on any marine mammal and seabird interactions • Environmental Strategies • Local Biodiversity Action Plans • Fishing gear impact studies • Local research in bycatch reduction • Appropriate Assessments or management plans for fisheries operating within SACs or SPAs
Management (Principle 3)	• IFCA Byelaws • Strategic Research Plans • IFCAs Research Plans • Evaluations of IFCA performance – timetable for future evaluations • Enforcement and inspection reports; including number of inspections carried out – by Royal Navy or by IFCAs at sea and by DEFRA / MMO on landing. Detailing fleets /gear/ fisheries • Management capacity of IFCA; including number of and roles of staff, annual budget, and details of enforcement powers
Other	• Shapefile (for GIS) of IFCA district • Any other data or information that you think will be useful or may inform our assessment

Appendix C. MSC Principles and Criteria

Below is a much-simplified summary of the MSC Principles and Criteria, to be used for over-view purposes only. A comprehensive description of the MSC Principles and Criteria can be obtained from the MSC website (www.msc.org) and guidance documents.

MSC Principles and Criteria

Principle 1

A fishery must be conducted in a manner that does not lead to over-fishing or depletion of the exploited populations and, for those populations that are depleted, the fishery must be conducted in a manner that demonstrably leads to their recovery.

Intent:

The intent of this Principle is to ensure that the productive capacities of resources are maintained at high levels and are not sacrificed in favour of short-term interests. Thus, exploited populations would be maintained at high levels of abundance designed to retain their productivity, provide margins of safety for error and uncertainty, and restore and retain their capacities for yields over the long term.

Status

» The stock is at a level that maintains high productivity and has a low probability of recruitment overfishing.

» Limit and target reference points are appropriate for the stock (or some measure or surrogate with similar intent or outcome).

» Where the stock is depleted, there is evidence of stock rebuilding and rebuilding strategies are in place with reasonable expectation that they will succeed.

Harvest strategy / management

» There is a robust and precautionary harvest strategy in place, which is responsive to the state of the stock and is designed to achieve stock management objectives.

» There are well defined and effective harvest control rules in place that endeavour to maintain stocks at target levels.

» Sufficient relevant information related to stock structure, stock productivity, fleet composition and other data is available to support the harvest strategy.

» The stock assessment is appropriate for the stock and for the harvest control rule, takes into account uncertainty, and is evaluating stock status relative to reference points.

Principle 2

Fishing operations should allow for the maintenance of the structure, productivity, function and diversity of the ecosystem (including habitat and associated dependent and ecologically related species) on which the fishery depends

Intent:

The intent of this Principle is to encourage the management of fisheries from an ecosystem perspective under a system designed to assess and restrain the impacts of the fishery on the ecosystem.

Retained species / Bycatch / ETP species

» Main species are highly likely to be within biologically based limits or if outside the limits there is a full strategy of demonstrably effective management measures.

» There is a strategy in place for managing these species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species.

» Information is sufficient to quantitatively estimate outcome status and support a full strategy to manage main retained / bycatch and ETP species.

Habitat & Ecosystem

» The fishery does not cause serious or irreversible harm to habitat or ecosystem structure and function, considered on a regional or bioregional basis.

» There is a strategy and measures in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types.

» The nature, distribution and vulnerability of all main habitat types and ecosystem functions in the fishery area are known at a level of detail relevant to the scale and intensity of the fishery and there is reliable information on the spatial extent, timing and location of use of the fishing gear.

Principle 3

The fishery is subject to an effective management system that respects local, national and international laws and standards and incorporates institutional and operational frameworks that require use of the resource to be responsible and sustainable.

Intent:

The intent of this principle is to ensure that there is an institutional and operational framework for implementing Principles 1 and 2, appropriate to the size and scale of the fishery.

Governance and policy

» The management system exists within an appropriate and effective legal and/or customary framework that is capable of delivering sustainable fisheries and observes the legal & customary rights of people and incorporates an appropriate dispute resolution framework.

» Functions, roles and responsibilities of organisations and individuals involved in the management process are explicitly defined and well understood. The management system includes consultation processes.

» The management policy has clear long-term objectives, incorporates the precautionary approach and does not operate with subsidies that contribute to unsustainable fishing.

Fishery specific management system

» Short and long term objectives are explicit within the fishery's management system.

» Decision-making processes respond to relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner.

» A monitoring, control and surveillance system has been implemented. Sanctions to deal with non-compliance exist and there is no evidence of systematic non- compliance.

» A research plan provides the management system with reliable and timely information and results are disseminated to all interested parties in a timely fashion.

The MSC Risk Based Framework

The Risk-Based framework is designed for use in association with the Marine Stewardship Council Default Assessment Tree in data deficient situations. The risk assessment framework is designed to assess components of the ecological system, including the target species (principle 1) and on species identified as retained catch, by-catch, on habitats, and on ecosystems (in Principle 2).

Two main assessment methods are distinguished, the scale, intensity, and consequence analysis (SICA) and the productivity susceptibility analysis (PSA). SICA is a qualitative method of assessing impact and is based in expert judgment. PSA can be defined as a semi-quantitative analysis to assess potential risk of impact. In the MSC risk assessment methodology these methods form part of a hierarchy, progressing from SICA to PSA. The MSC scoring procedure is a qualitative process. Scores are given in the scale to 60 to 100 and a score of 80 is required to ensure that the fishery meet the principles and criteria of the standard. If the SICA score is 80 or above, then this score is the score given for the relevant PI. If the score is below 80 (or for 1.1.1 in any case), a second type of assessment is carried out: a Productivity-Susceptibility Analysis (PSA).

Scale Intensity Consequence Analysis

In deriving the SICA score for each outcome Performance Indicator, the Scale (temporal and spatial) and Intensity of the relevant risk-causing activity, as well as the Consequence are required. Scale, Intensity, and Consequence analysis (SICA) in the MSC RBF- consists of the following six steps for each relevant component:

» **Step 1**: Determine "worst plausible case" combination of fishing activity and scoring element, and prepare a SICA scoring template for this species, habitat, or ecosystem.

» **Step 2**: Score Spatial scale of the activity for the Performance Indicator

» **Step 3**: Score Temporal scale of the activity for the Performance Indicator

» **Step 4**: Score the Intensity of the activity for all relevant components (e.g. target species, habitat, etc.). It depends on the temporal and spatial scale of the activity

» **Step 5**: Score the Consequence resulting from the intensity of the activity for all relevant sub-components (e.g. population size of target species) for the Performance Indicator.

» **Step 6**: Convert the consequence score into an MSC score, and feed back into the assessment tree, or go to PSA.

The criteria for scoring the impact of fishing in each of the SICA steps are presented below:

» **SICA Step 1: Determine "worst plausible case"**

See appendix X where table with risk causing activities is presented.

» **SICA Step 2: Score spatial scale of activity**

The greatest spatial extent on which the fishing activity occurs in relation to the overall distribution of the relevant component that is being evaluated (e.g. target species, bycatch species, and habitats) (**Table A.2.1**).

Table A.2.1. Table for deriving the SICA spatial scale score of the activity.

<10%	11-25%	26-40%	41-55%	56-70%	>70%
1	2	3	4	5	6

» **SICA Step 3: Score temporal scale of activity**

The highest temporal frequency must be used for determining the temporal scale score for the relevant component that is being evaluated (**Table A.2.2**)

Table A.2.2. Table for deriving the SICA temporal scale score of the activity.

Decadal (1 day every 10 years or so)	Every several years (1 day every several years)	Annual (1-100 days per year)	Quarterly (100-200 days per year)	Weekly (200-300 days per year)	Daily (300-365 days per year)
1	2	3	4	5	6

» **SICA Step 4: Score the intensity of the relevant activity**

The score for intensity of an activity (**Table A.2.3**) considers the direct impacts in line with categories such as capture, direct impact without capture, movement of biological material, and disturbance to physical processes.

Table A.2.3. Table for deriving the SICA intensity score of activity.

Level	Score	Description
Negligible	1	Remote likelihood of detection of activity at any spatial or temporal scale
Minor	2	Activity occurs rarely or in few restricted locations and evidence of activity even at these scales is rare
Moderate	3	Moderate detection of activity occurs reasonably often at broad spatial scale
Major	4	Detectable evidence of activity occurs reasonably often at broad spatial scale
Severe	5	Easily detectable localized evidence of activity or widespread and frequent evidence of activity
Catastrophic	6	Local to regional evidence of activity or continual and widespread evidence

SICA Step 5: Score the consequence of intensity for the relevant activity

The consequence of the activity on the target species (principle 1) is scored using the criteria shown in **Table A.2.4** and **Table A.2.5**. Where the impact of fishing is relevant to more than one sub-component, the most vulnerable will be selected. The consequence score is translated into a MSC score (see step 6).

Table A.2.4. Table for deriving the SICA consequence score of causing risk activity on target species (PI 1.1.1), retained species (PI2.1.1), and bycatch species (PI 2.2.1).

Subcomponent	Consequence Category 1	2	3
Population size	Insignificant change to population size/growth rate (r). Unlikely to be detectable against background variability for this population.	Possible detectable change in size/growth rate (r) but minimal impact on population size and none on dynamics.	Full exploitation rate but long-term recruitment dynamics not adversely damaged
Reproductive capacity	No detectable change in reproductive capacity. Unlikely to be detectable against background variability for this population.	Possible detectable change in reproductive capacity but minimal impact on population dynamics.	Detectable change in reproductive capacity, impact on population dynamics at maximum sustainable level, long-term recruitment dynamics not adversely damaged.
Age/size/sex structure	No detectable change in age/size/sex structure. Unlikely to be detectable against background variability for this population.	Possible detectable change in age/size/sex structure but minimal impact on population dynamics.	Detectable change in age/size/sex structure. Impact on population dynamics at maximum sustainable level, long-term recruitment dynamics not adversely damaged.
Geographic range	No detectable change in geographic range. Unlikely to be detectable against background variability for this population.	Possible detectable change in geographic range but minimal impact on population range and none on dynamics.	Clear change in geographic range due to fishing activities

Table A.2.5. Table for deriving the SICA consequence score of causing risk activity on habitats (PI 2.4.1)

Subcomponent	Consequence Category 1	2	3
Habitat types	No direct impact on habitat types. Impact unlikely to be detectable. Time taken to recover to pre-disturbed state on the scale of hours to days.	Detectable impact on distribution of habitat types. Time to recover from local impact on the scale of days to weeks, at larger spatial scales recovery time up to one year.	Impact reduces distribution of habitat types. Time to recover from local impact on the scale of months to a few years, at larger spatial scales recovery time of several years to less than two decades.
Habitat structure and function	No detectable change to the internal dynamics of habitat or populations of species making up the habitat. Time taken to recover to pre-disturbed state on the scale of hours to days.	Detectable impact on habitat structure and function. Time to recover from impact on the scale up to one year, regardless of spatial scale.	Impact reduces habitat structure and function. For impacts on non-fragile habitat structure, this may be for up to 50% of habitat affected, but for more fragile habitats, to stay in this category the % area affected needs to be smaller-- up to 20%. Time to recover from impact up to two decades.

» **SICA Step 5. Convert the consequence score into an MSC score, and feed back into the assessment tree, or go to PSA.**

» Upon conclusion of the SICA analysis for the relevant outcome indicator, and the completion of **Table A.2.5**, the SICA consequence score must be converted into an MSC score equivalent according to **Table A.2.6**, then fed back into the assessment tree for the PI under consideration.
»

Table A.2.6. Consequence categories and associated guidepost scores for the risk-based section of the MSC assessment. Each of the Performance Indicators undergoing the risk-based evaluation would be scored using this table.

» Consequence category	» MSC equivalent score for target, retained and bycatch species	MSC equivalent score for Habitats
» 1	» 100	» 100
» 2	» 80	» 80
» 3	»	» 60
» >3	»	» <60

Productivity Susceptibility Analysis

The PSA approach is based on the assumption that the risk to a species depend on two characteristics: (1) the extent of the impact due to the fishing activity, which will be determined by the susceptibility to the fishing activities (Susceptibility) and (2) the productivity of the species, habitat or community (Productivity), which will determine the rate at which recovery can occur after potential depletion or damage by fishing. It is important to note that the PSA analysis essentially measures potential risk. A measure of absolute risk requires some direct measure of abundance or mortality rate for the species in question, and this information is generally lacking in most small-scale and data deficient fisheries. For most fisheries, such information is not generally available for

most components except for target species. Thus, the PSA is designed to allow assessment of ecological risk without abundance estimates.

Productivity attributes are life history characteristics that correlate with the intrinsic rate of increase (r) while susceptibility attributes correlate with the elements of the susceptibility term (q) in the following equation based on the logistic growth equation with a removal term (qEB):

$$\frac{dB}{dt} = rB\left(1 - \frac{B}{K}\right) - qEB \quad (1)$$

where, for the species in question, r is the intrinsic rate of increase, B is the biomass, K the carrying capacity, q the susceptibility, E the effort, and t time. Susceptibility is made up of the following multiplicative elements:

$$q = A \times E \times S \times PCM \quad (2)$$

Where *A* is availability, *E* is encounterability, *S* is selectivity, and *PCM* is post-capture mortality of the particular species to the fishing activity under examination.

The PSA approach examines attributes of each unit that contribute to or reflect its productivity or susceptibility to provide a relative measure of the risk to the units. For species productivity is the average of seven attributes, while susceptibility is the product of four aspects (derived from five attributes) (**Table A.2.7**).

Table A.2.7. Attributes for estimating productivity and susceptibility of each species to the fishing method.

	Attribute
Productivity	Average age at maturity
	Average size at maturity
	Average maximum age
	Average maximum size
	Fecundity
	Reproductive strategy
	Trophic level
Susceptibility	Availability
	Encounterability
	Selectivity
	Post capture Mortality

The calculation of risk score

The overall risk score is calculated as the Euclidian distance from the origin of a 2D plot (0, 0). For two 2D points, P= (Px, Py) and Q=(Qx, Qy), the distance is computed as:

$$\sqrt{(Px - Qx) + (Py - Qy)}.$$

Where Px and Py are the productivity and the susceptibility score respectively and Qx and Qy is the origin of the 2D plot (0, 0). Thus the equation can be expressed as:

$\sqrt{Px + Py}$

The divisions between risk categories and hence scoring guideposts are based on dividing the area of the PSA plots into equal thirds. If all productivity and susceptibility scores (scale 1-3) are assumed to be equally likely, then 1/3rd of the Euclidean overall risk values will be greater than 3.18 (high risk),1/3rd will be between 3.18 and 2.64 (medium risk), and 1/3rd will be lower than 2.64 (low risk).

After the PSA is completed a final PSA score is derived for each species. These scores are divided into low risk, medium risk and high risk, on the basis of equal thirds (**Table A.2.8**).

Table A.2.8. PSA risk category for PSA scores. The cut-off values and the scoring guidepost are indicated.

PSA risk category	PSA score	MSC scoring guidepost	MSC action
High	>3.18	<60	Fail
Medium	3.18-2.64	60-80	Corrective action
Low	<2.64	>80	Pass

Appendix D. Total inshore landings by UK vessels into English ports

Total value and live weight of landings by UK vessels into English ports from inshore ICES rectangles in 2010 (MMO, 2012)

Species	Value	Live weight, tonnes
Sole	£11,662,914	1,432
Lobsters	£11,651,298	1,252
Brown crab	£10,652,186	8,750
Scallops	£9,260,899	6,274
Cuttlefish	£5,543,458	2,819
Whelks	£5,041,052	7,763
Monkfish	£4,684,251	1,739
Lemon Sole	£4,473,079	1,210
Bass	£4,327,437	604
nephrops	£2,768,263	1,292
Cod	£2,489,119	1,430
Plaice	£1,954,563	1,535
Species unknown*	£1,858,931	6,988
Turbot	£1,724,782	209
Brown Shrimps	£1,675,431	830
Squid	£1,525,690	383
Pollack	£1,515,421	761
Whiting	£1,196,760	1,567
Haddock	£1,141,492	1,007
Brill	£1,083,274	194
Mackerel	£1,038,675	947
Thornback Ray	£930,031	630

Species	Value	Live weight, tonnes
Gurnard and Latchet	£418,198	656
Native Oysters	£317,199	185
Horse Mackerel	£310,911	1,120
Small-eyed Ray	£294,034	184
Grey mullet	£270,804	172
Anchovy	£240,639	301
Mixed Clams	£229,152	117
Black Seabream	£203,445	192
Clams (V.Decussata)	£196,390	79
Crawfish	£186,085	8
Skates and Rays	£180,734	114
Ling	£175,695	152
Smoothhound	£171,068	233
Pouting (Bib)	£161,305	537
Herring	£117,118	241
Cuckoo Ray	£116,739	102
Velvet crab	£112,133	89
Conger Eels	£89,217	95
Halibut	£85,588	11
Spotted Ray	£78,934	65
Hake	£66,053	42
Dabs	£64,852	125

Species	Value	Live weight, tonnes
Unid DS Squal Sharks & Dogfish	£31,496	149
Sandy Ray	£20,305	13
Common Prawns	£19,577	1
Sea Breams	£17,333	7
Clams (M.Mercenaria)	£15,019	11
Saithe	£12,433	13
Sprats	£10,162	37
Shagreen Ray	£8,028	5
Tope	£6,018	8
Witch	£5,907	6
Gilt-Head Seabream	£5,209	1
Wrasses	£5,111	14
Long-nosed Skate	£2,634	1.5
Spurdog	£2,173	1.6
Mixed Squid and Octopi	£1,743	0.4
Catfish	£961	0.6
Gurnards - Red	£754	0.6
Greater Weever	£704	0.4
Shad	£680	1.7
Red (Blackspot) Seabream	£593	0.1
Garfish	£512	1.2
Dogfish (Scyliorhinidae)	£468	0.6