

moray offshore renewables ltd

Environmental Statement

Technical Appendix 5.1 A - Commercial Fisheries Technical Report

Telford, Stevenson, MacColl Wind Farms
and associated Transmission Infrastructure
Environmental Statement



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Contents

1.0 Glossary of Terms..... 6

2.0 Introduction 7

3.0 Study Area..... 8

4.0 Methodology..... 9

 4.1 MMO Fisheries Statistics (Landings Values and Effort Data Sets) 9

 4.2 MMO Satellite Tracking (VMS) Data 9

 4.3 MMO Fisheries Surveillance Sightings Data..... 9

 4.4 Marine Scotland Data Analysis 9

 4.5 Fishery Specific Information 9

 4.6 Future Fisheries..... 9

5.0 Data and Information, Sensitivities and Qualifications 10

 5.1 International Council for the Exploration of the Sea (ICES)..... 10

 5.2 MMO Data Sets 10

 5.2.1 MMO Fisheries Statistics..... 10

 5.2.2 MMO UK Satellite Tracking (VMS) Data..... 11

 5.2.3 MMO Surveillance Sightings 11

 5.3 Marine Scotland Data Analysis 11

 5.4 Fishermen and Fishermen’s Representatives 12

6.0 Fisheries Controls and Legislation..... 12

 6.1 Fishing Vessel Licenses..... 12

 6.2 Territorial Limits..... 13

 6.3 Quota Restrictions 13

 6.3.1 Over-10 Metre Fleet 15

 6.3.2 Under-10 Metre Fleet 15

 6.4 Effort (Days at Sea) Restrictions..... 16

 6.5 Shellfish Entitlements 16

 6.6 Scallop Dredging Restrictions..... 16

 6.7 Regional and Local Fishing Restrictions 16

7.0 MMO Fisheries Statistics (Landings Values and Effort Data Sets) 18

 7.1 Landings Values..... 18

 7.1.1 National Overview 18

 7.1.2 Regional Overview 20

 7.1.3 Local Study Area (ICES Rectangle 45E7)..... 23

 7.1.4 Landings Values by Port 29

 7.2 Effort (Days at Sea) 30

7.2.1 Regional Overview	30
7.2.2 Local Study Area (ICES Rectangle 45E7).....	32
8.0 MMO UK Satellite Tracking (VMS) Data.....	36
8.1 National Overview	36
8.2 Regional Study Area	36
8.2.1 2005 to 2008 Data.....	36
8.2.2 2009 Data.....	36
9.0 MMO Fisheries Surveillance Sightings Data.....	44
10.0 Marine Scotland Data Analysis	46
11.0 Fishing Methods, Operating Patterns and Current Practices	57
11.1 Scallop Dredging	57
11.1.1 Fishing Gear.....	57
11.1.2 Fishing Patterns and Practices	58
11.2 Demersal Otter Trawling for <i>Nephrops</i> , Whitefish or Squid.....	59
11.2.1 Whitefish Fishery	61
11.2.2 <i>Nephrops</i> Fishery	61
11.2.3 Squid Fishery	62
11.3 Scottish Seine Netting.....	62
11.4 Potting.....	64
12.0 Vessels.....	66
12.1 Scallop Fishery.....	66
12.1.1 Visiting Scallop Vessels.....	68
12.2 Bottom Trawl Fisheries	71
12.2.1 Whitefish Fishery	71
12.2.2 <i>Nephrops</i> Fishery	73
12.2.3 Squid Fishery	75
12.2.4 Visiting Demersal Trawl Vessels.....	75
12.3 Crab and Lobster Fishery	76
13.0 Fishing Grounds	78
13.1 Scallop Fishing Grounds	78
13.2 Whitefish Fishery Grounds.....	78
13.3 <i>Nephrops</i> Fishing Grounds	78
13.4 Squid Fishery Grounds	78
13.5 Crab and Lobster Fishery Grounds.....	78
14.0 Future Fisheries.....	82
14.1 Scallop Fishery.....	82
14.2 Whitefish and Flatfish Fisheries	82

14.3 <i>Nephrops</i> Fishery	82
14.4 Squid Fishery	82
14.5 Bivalve Fishery	83
14.6 Sandeel Fishery	83
14.7 Foreign Vessel Activity	84
15.0 Consultation List.....	85

Figures

Figure 3.1 Moray Offshore Renewables Ltd. Eastern Development Study Area	8
Figure 6.1 Combined National TACs (Top 10 Species) in ICES Area IV (North Sea), 2006-2010 (excluding Blue Whiting).....	14
Figure 6.2 TACs (Top 10 Species) in ICES Area IV (North Sea), UK only, 2006-2010.....	15
Figure 6.3 SI Restrictions upon Inshore Fishing Activities Relevant to the Regional Study Area	17
Figure 7.1 Landings Values by Species (average 2000 to 2009) in the National Study Area (Source: MMO).....	18
Figure 7.2 Landings Values by Method (average 2000 to 2009) in the National Study Area (Source: MMO).....	19
Figure 7.3 Landings Values of Scallops only (average 2000 to 2009) in the National Study Area (Source: MMO).....	20
Figure 7.4 Landings Values by Species (average 2000 to 2009) in the Regional Study Area (Source: MMO).....	21
Figure 7.5 Landings Values by Method (average 2000 to 2009) in the Regional Study Area (Source: MMO).....	22
Figure 7.6 Landings Values by Vessel Category (average 2000 to 2009) in the Regional Study Area (Source: MMO).....	23
Figure 7.7 Percentage Distribution of Landings Values by Species in ICES Rectangle 45E7 (Source: MMO).....	24
Figure 7.8 Average Annual Landings Values (average 2000 to 2009) by Species and Methods in ICES Rectangle 45E7 (Source: MMO).....	24
Figure 7.9 Average Annual Landings Values (average 2000 to 2009) by Methods and Vessel Length in ICES Rectangle 45E7 (Source: MMO).....	25
Figure 7.10 Annual Variations in Landings Values of Species in ICES Rectangle 45E7 (Source: MMO).....	26
Figure 7.11 Average Annual (average 2000 to 2009) Seasonality of Species in ICES Rectangle 45E7 (Source: MMO).....	27
Figure 7.12 Average Annual (average 2000 to 2009) Seasonality of Scallops in ICES Rectangle 45E7 (Source: MMO).....	27
Figure 7.13 Average Annual (average 2000 to 2009) Seasonality of <i>Nephrops</i> in ICES Rectangle 45E7 (Source: MMO).....	28
Figure 7.14 Average Annual (average 2000 to 2009) Seasonality of Haddock in ICES Rectangle 45E7 (Source: MMO).....	28
Figure 7.15 Seasonal Landings of Squid during 2009 in ICES Rectangle 45E7 (Source: MMO)	29
Figure 7.16 Effort (Days at Sea) by Fishing Method in the Regional Study Area (average 2000 to 2009) (Source: MMO).....	31
Figure 7.17 Effort (Days at Sea) by Vessel Category in the Regional Study Area (average 2000 to 2009) (Source: MMO).....	32
Figure 7.18 Annual Variations in Effort (Days Fished) by Vessel Category in ICES Rectangle 45E7 (Source: MMO).....	33
Figure 7.19 Average Annual (average 2000 to 2009) Seasonality by Effort (Days Fished) and Vessel	

Category in ICES Rectangle 45E7 (Source: MMO).....	33
Figure 8.1 Satellite (VMS) Density of all UK Over-15 Metre Vessels (average 2005-2008) (Source: MMO).....	37
Figure 8.2 Satellite (VMS) Density of all UK Over-15 Metre Vessels (average 2005-2008) (Source: MMO).....	38
Figure 8.3 2009 Satellite (VMS) Density of all UK Over-15 Metre Vessels (2009) (Source: MMO)	39
Figure 8.4 Satellite (VMS) Density of all UK Over-15 Metre Boat Dredge Vessels Only (2009) (Source: MMO).....	40
Figure 8.5 Satellite (VMS) Density of all UK Over-15 Metre <i>Nephrops</i> Trawl Vessels Only (2009) (Source: MMO).....	41
Figure 8.6 Satellite (VMS) Density of all UK Over-15 Metre Whitefish Gear Vessels Only (2009) (Source: MMO).....	42
Figure 8.7 Satellite (VMS) Density of all UK Over-15 Metre "Other" Gear (2009) (Source: MMO).....	43
Figure 9.1 Surveillance Sightings by Method in the Regional Study Area (Source: MMO)	44
Figure 9.2 Surveillance Sightings by Nationality in the Regional Study Area (Source: MMO).....	45
Figure 10.1 Fishing Gear Distribution for Over-15 Metre Vessels in the Moray Firth, 2007 (Source: Marine Scotland).....	47
Figure 10.2 Fishing Gear Distribution for Over-15 Metre Vessels in the Moray Firth, 2008 (Source: Marine Scotland).....	48
Figure 10.3 Fishing Gear Distribution for Over-15 Metre Vessels in the Moray Firth, 2009 (Source: Marine Scotland).....	49
Figure 10.4 Commercial Landings of Finfish (Demersal and Pelagic) for Over-15 Metre Vessels in the Moray Firth, 2007 (Source: Marine Scotland)	50
Figure 10.5 Commercial Landings of Finfish (Demersal and Pelagic) for Over-15 Metre Vessels in the Moray Firth, 2008 (Source: Marine Scotland)	51
Figure 10.6 Commercial Landings of Finfish (Demersal and Pelagic) for Over-15 Metre Vessels in the Moray Firth, 2009 (Source: Marine Scotland)	52
Figure 10.7 Commercial Landings of Demersal Finfish Only for Over-15 Metre Vessels in the Moray Firth, 2009 (Source: Marine Scotland)	53
Figure 10.8 Commercial Landings of Shellfish (Edible Crab, Scallops and <i>Nephrops</i>) for Over-15 Metre Vessels in the Moray Firth, 2007 (Source: Marine Scotland).....	54
Figure 10.9 Commercial Landings of Shellfish (Edible Crab, Scallops and <i>Nephrops</i>) for Over-15 Metre Vessels in the Moray Firth, 2008 (Source: Marine Scotland).....	55
Figure 10.10 Commercial Landings of Shellfish (Edible Crab, Scallops and <i>Nephrops</i>) for Over-15 Metre Vessels in the Moray Firth, 2009 (Source: Marine Scotland)	56
Figure 11.1 Scallop Dredging (created by BMM)	57
Figure 11.2 Single Net Demersal Otter Trawl (created by BMM)	60
Figure 11.3 Scottish Seine Net (Source: Seafish 2005)	63
Figure 11.4 Scottish Seine Net Operation (Source: Seafish 2005)	63
Figure 11.5 Example of a 'Parlour' Lobster Pot (Source: Seafish 2005)	64
Figure 11.6 Fleet of Pots (Source: Seafish 2005)	64
Figure 12.1 Scallop Landings by Value (£) in the UK.....	69
Figure 12.2 Home Ports of the Nomadic Fleet targeting Scallops in the Moray Firth.....	70
Figure 13.1 Moray Firth Scallop Fishing Grounds	79
Figure 13.2 Moray Firth Haddock Fishing Grounds	79
Figure 13.3 Moray Firth <i>Nephrops</i> Fishing Grounds.....	80
Figure 13.4 Moray Firth Squid Fishing Grounds.....	81
Figure 13.5 Moray Firth Creel Fishing Grounds	81

Tables

Table 6.1 Under-10 Metre Final Quota Allocations in the North Sea (Source: MMO)	16
Table 7.1 Top 20 Ports by Landings Value from ICES Rectangle 45E7 (Source: MMO)	30
Table 7.2 Top 20 Ports by Effort (Days Fished) in ICES Rectangle 45E7 (Source: MMO).....	34
Table 7.3 Annual Effort (Days Fished) by Port and Vessel Length in ICES Rectangle 45E7 (Source: MMO).....	35
Table 11.1 Gear Dimensions of Vessel A, a Scallop Dredge Vessel.....	58
Table 11.2 Gear Dimensions of Vessel B, a Demersal Otter Trawler	60
Table 11.3 Gear Dimensions of Vessel C, a Scottish Seine Net Vessel.....	63
Table 12.1 Scallop Vessels with Home Ports in the Moray Firth	66
Table 12.2 Basic Specifications of the six Scallop Dredge Vessels listed in Table 12.1.....	67
Table 12.3 Vessel I, Multi-Purpose Demersal Trawler and Dredger operating out of Buckie	68
Table 12.4 Visiting Scallop Dredges to the Moray Firth.....	69
Table 12.5 Specifications of Vessel K, Vessel P, Vessel M and Vessel AD.....	70
Table 12.6 List of Demersal Trawlers registered at Ports within the Moray Firth (source: MMO)	71
Table 12.7 Moray Firth Demersal Whitefish Vessels	71
Table 12.8 Specifications of Vessel AE, Vessel AF and Vessel AG	72
Table 12.9 Moray Firth Vessels employing Scottish Seine Nets to target Whitefish.....	72
Table 12.10 Vessel C, Scottish Seine Net Vessel operating out of Wick.....	72
Table 12.11 Moray Firth Demersal Trawlers who are known to be actively targeting <i>Nephrops</i>	73
Table 12.12 Vessel Specifications of the Six Demersal Trawl Vessels Listed in Table 10.9	74
Table 12.13 Vessel AO, Demersal Trawl Vessel	75
Table 12.14 Vessel AP, Demersal Trawl Vessel.....	75
Table 12.15 List of Creelers registered at Ports within the Moray Firth (Source: MMO).....	76
Table 12.16 Creel Vessels Fishing in the Moray Firth	76
Table 12.17 Vessel Specifications of the 12 Creel Vessels based in the Moray Firth	77
Table 15.1 Vessels who contributed to the Commercial Fishing Baseline	85

1.0 Glossary of Terms

BMM – Brown and May Marine Limited
BWEA – British Wind Energy Association
CEFAS – Centre for Environment, Fisheries and Aquaculture Science
CFP – Common Fisheries Policy
CPA – Coast Protection Act 1949
CSV – Comma separated variable
Defra – Department for Environment, Food and Rural Affairs
EC – European Commission
EDP – EDP Renováveis
EIA – Environmental Impact Assessment
EU – European Union
FEPA – Food and Environment Protection Act 1985
FIN – Fisheries Information Network
FIR – Fishing Industry Representative
FMC - Fisheries Monitoring Centre
hp – horsepower
ICES – International Council for the Exploration of the Sea
IFG – Inshore Fisheries Group
MAGP - Multi Annual Guidance Programme
MFOWDG – Moray Firth Offshore Wind Farm Developers Group
MMO – Marine Management Organisation
MORL – Moray Offshore Renewables Limited
nm – nautical mile
RSS – Registry of Shipping and Seamen
SERL – SeaEnergy Renewables Limited
SFF – Scottish Fishermen’s Federation
SI – Statutory Instrument
TAC – Total Allowable Catch
VCU – Vessel Capacity Unit
VMS – Vessel Monitoring System
UWTV - Underwater Television

12nm limit – Territorial waters of EU Member States extend to 12nm. Member States manage these waters exclusively within these limits

6nm limit – exclusive access to UK vessels only within 6nm

6nm-12nm limit – some access to certain EU Member States in identified areas around the UK coast, based upon historic access

Under-10m –Category of fishing vessels that are less than 10m in length

10-15m – Category of fishing vessels that are between 10m and 15m in length

Over-15m – Category of fishing vessels that are greater than 15m in length

Creeling – The Scottish designation for potting

Demersal – Activities or species located near or on the sea bed

Pelagic – Activities or species located in the water column

Quota – A measure of the quantity of a species that can legally be landed within a set period

2.0 Introduction

Given below is the description of the commercial fishing baseline for the Moray Offshore Renewables Limited (MORL) proposed offshore wind farm development, Eastern Phase Development, in the Moray Firth. The preparation of the baseline takes into account the requirements of Food and Environmental Protection Act 1985 (FEPA), Coast Protection Act 1949 (CPA), Department for Environment, Food and Rural Affairs (Defra) and Centre for Environment, Fisheries and Aquaculture Science (CEFAS) as specified in the 2004 Guidelines (CEFAS 2004) and British Wind Energy Association (BWEA) 2004 Recommendations (BWEA 2004).

The regional socio-economic importance of wild salmon and sea trout fisheries, combined with the potential significance of impact from the proposed development is such that they have been separately assessed and the findings covered in an additional report.

The purpose of this report is to establish a commercial fisheries baseline which is relevant to the MORL wind farm site. This will allow an Environmental Impact Assessment (EIA) to be undertaken which will consider the development relative to any commercial fishing activities that occur within the area, and to aid with the development of mitigation strategies, if required.

Presently, there is no single data source or recognised model for establishing a comprehensive commercial fisheries baseline which concentrates on discrete sea areas such as offshore wind farm sites. Therefore, the following baseline has been derived using data and information from a number of sources.

Establishing a fisheries baseline is complicated by the fact that fishing activities are rarely the same year on year. Fluctuations in landings, changes in legislation, economic constraints such as fuel costs and crew availability, as well as additional environmental restrictions such as weather all contribute to variations in a fisheries baseline, and fishing practices may change as a result.

3.0 Study Area

The study area for the assessment of commercial fishing intensity and values is shown in Figure 3.1 below. The approach has been to provide a national overview allowing fishing grounds in the general area of the MORL Eastern Development to be described within a national context. The regional study area has been defined to ensure sufficient coverage of those areas surrounding the site. The local study area is the smallest spatial unit available for the collation of fisheries statistics. Where possible, fishing activities in the specific area of the site have also been described.

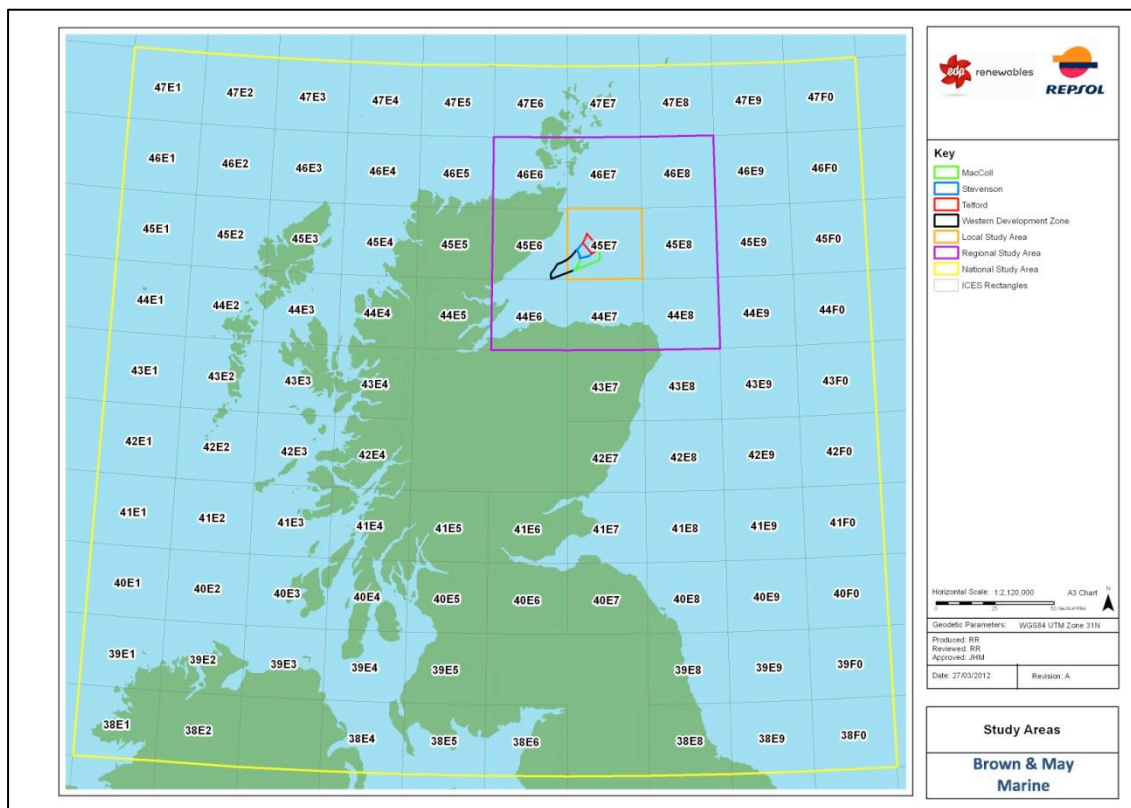


Figure 3.1 Moray Offshore Renewables Ltd. Eastern Development Study Area

4.0 Methodology

Establishing a commercial fisheries baseline requires an approach that incorporates a number of different data and information sources. Each data and information source is subject to varying sensitivities and limitations, described in Section 0, and as a result separate analysis is required in each instance. The aim is to describe in progressive detail commercial fishing activities by building upon the sources and analysis outlined below:

4.1 MMO Fisheries Statistics (Landings Values and Effort Data Sets)

Fisheries statistical data for the ten year period between 2000 and 2009 has been collected by the Marine Management Organisation (MMO). The data includes landings (weight and value) and effort (days fished) data. This data set has been analysed to identify:

- Species targeted
- Fishing methods used
- Vessel by length category (under-10 metres, 10-15 metres, over-15 metres)
- Annual variations
- Seasonal variations
- Landings values and effort by port

4.2 MMO Satellite Tracking (VMS) Data

The MMO has provided satellite tracking data (VMS) for the years 2005 to 2008 and 2009 for all fishing vessels over-15 metres in length. The 2005 to 2008 data collates the activities of all over-15 metre vessels, however the categorisation of these vessels by fishing method was unreliable and therefore the data set has not been broken down in this way. The 2009 data was released in a different format and is thus separately analysed. The densities of recorded position plots of the 2009 data are shown in a larger grid format, however vessels have been accurately categorised and the data sets have been classified by fishing method.

4.3 MMO Fisheries Surveillance Sightings Data

Fisheries surveillance sightings have also been provided by the MMO which records sightings of fishing vessels in UK waters by fishing method and nationality. The limitations of this data set are discussed in Section 4.8.3; however the data set is useful for the purposes of assessing the spatial distribution of all fishing vessels in UK waters.

4.4 Marine Scotland Data Analysis

Marine Scotland provided additional charts to illustrate the spatial densities of the over-15 metre fleet relative to recorded landings. This information supplements the data analysis already undertaken.

4.5 Fishery Specific Information

Information provided by fishermen and their representatives also contributes to the establishment of a commercial fisheries baseline. Such information assists in the identification of the fisheries that occur in the regional and local areas relative to the MORL Eastern Development, and the vessels that target those fisheries. The information has been collated through ongoing consultation and liaison with fishing organisations, fishermen and their representatives.

4.6 Future Fisheries

In order to identify potential future changes to the existing baseline relevant to the timeframe of the MORL Eastern Development, both desktop research and consultation were undertaken. It should be

recognised that this data gathering is limited by the ongoing and proposed changes to the management of commercial fisheries.

Data and Information, Sensitivities and Qualifications

The principal sources of data and information used were:

- International Council for the Exploration of the Sea (ICES)
- Marine Management Organisation (MMO)
- Marine Scotland
- Marine Scotland Science
- District Fishery Offices
- The Scottish Fishermen's Federation (SFF)
- Fishermen and their representatives

Consultation with local fishermen was principally undertaken by BMM, in association with the SFF and the FIRs appointed on behalf of the Moray Firth Offshore Wind Farm Developers Group (MFOWDG).

It should be noted that in some instances fishing terminology varies by data set. Specifically, the use of static gear to target crustaceans such as crab and lobster is known as 'potting' in England and 'creeling' in Scotland.

The analysis of the data and information sources used in the compiling of this baseline are subject to the following qualifications, limitations, sensitivities and gaps:

4.7 International Council for the Exploration of the Sea (ICES)

ICES statistical rectangles are the smallest spatial unit used for the collation of fisheries statistics by the European Commission (EC) and Member States'. The boundaries of ICES rectangles align to 1° of longitude and 30' of latitude. As demonstrated in Figure 3.1 previously, the area of the ICES rectangle is relatively larger than the MORL Eastern Development, which is situated in ICES rectangle 45E7. As mentioned previously, the distribution of fishing activity in an ICES rectangle is unlikely to be evenly distributed and therefore the analysis of fisheries statistics by ICES rectangles should take into account the small proportion of a statistical area and variation in the levels of activity that the site covers.

4.8 MMO Data Sets

4.8.1 MMO Fisheries Statistics

The MMO collects and collates fisheries data for the whole of the UK by ICES rectangle. The primary source of data comes from the EC daily log sheets that the over-10 metre fleet must complete and submit.

Each ICES rectangle incorporates a relatively large sea area. Given landings values are attributed to the rectangle as a whole; however it is unlikely that the spread of fishing activities are equal throughout the rectangles and therefore the limitations of this data source should be recognised and taken into consideration.

Currently, vessels under-10 metres in length are not required to submit daily log sheets, although voluntary submissions can be made. Local fisheries officers also undertake dockside checks on the under-10 metre fleet. To facilitate further collection of fisheries data from the under-10 metre fleet, two schemes have been introduced: The Shellfish Entitlement Scheme (introduced during 2004)

which is discussed further in Section 5.5 and the 'Registration of Buyers and Sellers of First Sale Fish and Designation Auction Site Scheme' (2005). Due to the recent introduction of these schemes, it must be noted that prior to 2005 the MMO fisheries statistics for the under-10 metre fleet may, to some extent, underestimate the true levels of fishing in the area where a large percentage of the activity is by vessels in this category.

Vessels referred to as 'non-UK' in the MMO fisheries statistics only include foreign vessels landing into UK ports and therefore do not take into account non-UK vessels fishing in the area but landing into non-UK ports. The values given for the non-UK fleet derived from the analysis of this data set should therefore take this into account and not be considered as a true indication of the total foreign activity in the area.

4.8.2 MMO UK Satellite Tracking (VMS) Data

Satellite tracking currently applies to all European Union (EU) registered vessels over-15 metres in length. A transmitter onboard each vessel transmits the vessel's position approximately once every two hours via satellite link to the MMO and other national EU control centres. The MMO receives information from all UK vessels, regardless of location, and all non-UK vessels within UK waters. Information about non-UK vessels in UK waters cannot be disclosed by the MMO without prior permission from the vessels Member State regulating body. It should be noted that satellite data does not differentiate between vessels steaming and vessels fishing and all vessels that are stationary in port have not been included in the data set. The disclosure of independent UK vessels' identities is restricted under the Data Protection Act (1998).

A recent change in UK and EU policy has led to an alteration in the way satellite tracking data is released from 2009; vessel coordinates can no longer be released and instead the number of vessels by type is given in a grid of rectangles, each approximately 70nm², with a breakdown of density by gear type, which was not possible with the 2005 to 2008 data sets. Due to the differences in format, the 2009 data has been independently analysed from the 2005 to 2008 data set.

4.8.3 MMO Surveillance Sightings

To manage fisheries legislation, fishery protection aircraft and surface craft record surveillance sightings of all vessels in UK waters. This data is used to give an indication of the distribution of fishing activity by method and nationality; however it should not be used for quantitative assessments of activity due to the low frequency of flights over an area, which are generally once a week and only during daylight hours.

4.9 Marine Scotland Data Analysis

Charts have been derived by Marine Scotland Science and kindly provided to BMM to assist in the establishment of a commercial fisheries baseline in the Moray Firth area. The charts were produced by applying VMS records to the Fisheries Information Network (FIN), which is the Scottish Governments sea fisheries database. FIN holds information on voyages (catches, gear, mesh size etc.) and landings (weight, price at sale etc.). Both the VMS records and FIN database use the *Registry of Shipping and Seamen (RSS) number*, which identifies vessels (this identifier is otherwise protected information), as a common denominator. *Logtime* (the date and time of each VMS transmission) identifies each vessels voyage and enables the location of a vessel during each trip to be linked to the gear used and the weight of the landings.

In order to distinguish between vessels steaming and fishing, the speed of the vessel at the time of each VMS transmission has been used as a filter. It has been assumed that vessels travelling at speeds of over five knots would be steaming as opposed to fishing. The information provided in the

charts below describes the landings of each fishing trip. A fishing trip generally comprises of a number of fishing events, however information on catches per fishing event are not available and due to this multiple fishing events all contribute to the overall landings weight for the fishing trip. All information provided in the charts below is anonymous and as has been previously stated, the VMS records are limited by the use of over-15 metre vessels only.

4.10 Fishermen and Fishermen's Representatives

Consultation on the MORL Eastern Development has been undertaken with individual skippers and their representatives. Despite extensive consultation through open and advertised fisheries stakeholder meetings, comprehensive field work and through the forum of the Inshore Fisheries Group (IFG), it is possible that certain individuals and some unaffiliated stakeholders may not have been included in the assessment and in the event that additional information is provided before the completion of the EIA, the baseline would be revised to reflect this.

5.0 Fisheries Controls and Legislation

Whilst the international aspect of European fisheries management, such as setting of quotas remains a reserved power, the implementation of fisheries regulations are devolved to the Scottish Government, and administered by Marine Scotland.

5.1 Fishing Vessel Licenses

In order to engage in commercial fishing, vessels must hold a valid license. A fishing license is a permit for the boat to be legally engaged in valid commercial fishing activities, i.e. to be entitled to catch fish and sell for profit. The current licensing scheme is designed to prevent increases in fleet numbers and catching capacities through the use of vessel capacity units (VCUs). Decommissioning schemes have also limited increases in fishing vessel numbers over the past 20 years, with significant numbers of both UK and other Member States' vessels accepting the proposal.

Since 1983, the EU Common Fisheries Policy (CFP) has primarily dictated the structure and capacity of the UK and Scottish fishing fleets. Between 1997 and 2002, a Multi Annual Guidance Programme (MAGP) was devised within the CFP to manage fleet structures, and fishing by method was restricted by capacity limits and effort reduction targets. When the MAGP ended in 2002, it was replaced by Member State level controls which implement a system of exit/entry restrictions to impose effort level limits. Essentially, a fleet capacity cannot be increased and vessels can only enter the fleet when an equivalent or larger capacity has exited.

One of the most significant reduction schemes upon the Scottish fleet in recent years were the successive decommissioning schemes in 2001/2002 and 2003/2004, which removed 165 vessels from the national demersal fleet.

In 2010 the License Parking scheme was introduced by the Scottish Government to assist the fleet in adjusting to the current, restrictive conditions. The purpose of the scheme is to enable the licenses of multiple vessels to be combined and placed upon one vessel, thus reducing both the long and short term fixed and variable costs through vessel sharing. The inactive vessels become 'parked', although this process is reversible. There is also the possibility that the effort generated by those vessels wishing to leave the industry can be bought and concentrated on the remaining vessels (this is not currently possible under licensing rules alone). Currently, over 40 vessels have applied for the License Parking scheme and Ministers have also introduced a publicly funded (co-funded by the European Fisheries Fund) fleet resilience grant scheme through consultation with industry

stakeholders and the Scottish Fisheries Council. This scheme is designed to dispose of those vessels that have been made dormant through License Parking.

5.2 Territorial Limits

The territorial fishing limits of Member States extend out to 12nm. Access within 6nm of the coast is generally restricted to the vessels of that Member State. Access to fishing grounds between the 6 and 12nm limit is only granted to vessels from other Member States if they have historic rights. In Scotland's 6-12nm limit off the east coast, there are no historic rights for other Member States' vessels. There is however, a number of UK flagged and licensed fishing vessels under foreign ownership, which could in theory have a right to fish within the UK 12nm limit. Outside this limit (including the MORL Eastern Development), any vessel from the EU could potentially fish the grounds.

5.3 Quota Restrictions

Quota for fish stocks, activities of fishing vessels and fishing effort (days at sea) in Scottish waters are managed and controlled by the Scottish Executive¹. These controls and regulations have direct and indirect impacts on existing and future commercial fishery baselines.

The primary responsibility of the CFP, since its ratification in the early 1980s, is the long-term conservation of fish stocks in EU waters. The CFP aims to protect pressure stocks (species identified as requiring management) through a system of quotas by ICES area and sub-area. A quota is measured as the quantity of landed fish and does not count discards. Total Allowable Catches (TACs) are calculated annually and allocated for each pressure stock by area or sub-area. Figure 5.1 shows the TACs for ICES area IV (North Sea) of the top 10 species for all countries, excluding blue whiting. Blue whiting has been excluded due to its proportionally high quota allocation. It is targeted in deep, offshore waters and the TAC for this species is not limited to Area IV.

Figure 5.2 shows the TACs for the UK in the same area. It can be seen that herring currently records the largest TAC, although it has significantly decreased over the five year period. Demersal species such as haddock, plaice, anglerfish (monks), saithe, whiting and cod constitute a significant proportion of TACs for the UK. *Nephrops*, a shellfish, is also a species of national importance in the North Sea.

¹ The Scottish Government, Fisheries Section: <http://www.scotland.gov.uk/Topics/Fisheries/Sea-Fisheries>

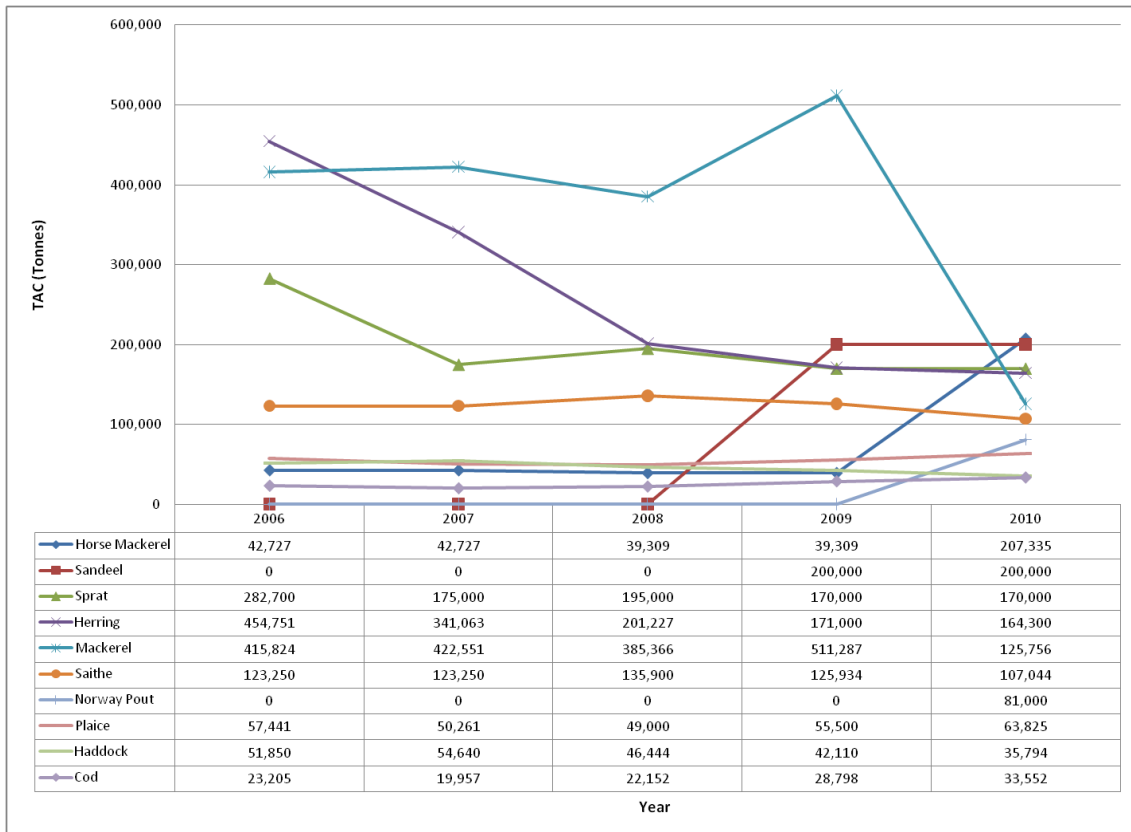


Figure 5.1 Combined National TACs (Top 10 Species) in ICES Area IV (North Sea), 2006-2010 (excluding Blue Whiting)



Figure 5.2 TACs (Top 10 Species) in ICES Area IV (North Sea), UK only, 2006-2010

The TAC system has been heavily criticised as a purely conservation measure as it is considered that the system encourages the discarding of either undersized or over-quota fish at sea. As of 2009, due to these concerns, the CFP has been undergoing review and therefore fisheries management policies and legislation could change significantly in the future. It is envisaged that the reform proposals will be adopted by the College of Commissioners (who implement new EU laws) in early 2011².

5.3.1 Over-10 Metre Fleet

National, regional and individual quotas for the over-10 metre fleet are assigned on the basis of historical rights. Vessel quotas are tangible assets which are eligible to be sold or leased, and national quotas may be exchanged between Member States.

5.3.2 Under-10 Metre Fleet

In Scotland over two thirds of the fleet are under-10 metres³, although the sector receives only approximately 3% of the total allowable catch. The under-10 metre fleet is also subject to sea area and quota restrictions for certain species. Table 5.1 lists the North Sea under-10 metre quota allocations for the past four years.

² Synthesis of the Consultation on the Reform of the Common Fisheries Policy (2010) European Commission

³ Natural Scotland (2010) Scottish Sea Fisheries Statistics 2009. Scottish Government

Table 5.1 Under-10 Metre Final Quota Allocations in the North Sea (Source: MMO)

Species	2007 Quota (Tonnes)	2008 Quota (Tonnes)	2009 Quota (Tonnes)	2010 Quota (Tonnes) (Provisional)
North Sea <i>Nephrops</i>	1587.3	1267.2	1078.8	882.0
North Sea Cod	281.0	403.1	561.3	588.0
North Sea Haddock	175.2	131.6	80.5	127.9
North Sea Sole	278.1	342.1	275.7	110.5
North Sea Plaice	43.3	54.2	40.7	40.4
North Sea Whiting	660.6	89.8	355.5	321.9
North Sea Skate and Rays	209.3	265.1	106.3	103.1
North Sea Lemon Sole/Witches	62.6	72.6	23.2	22.2
North Sea Turbot/Brill	22.7	17.9	15.0	10.6
North Sea Dab/Flounder	17.6	18.7	18.9	19.4

5.4 Effort (Days at Sea) Restrictions

In addition to quota restrictions, the over-10 metre fleet are subject to days at sea restrictions. This is part of the ECs policy aiming to reduce fishing effort in EU waters (one of the foundations of the CFP). The regulation itself (Annex V, EU Regulation 2287/2003) is somewhat complex, relating to gear type, mesh size and elected management periods, but effectively the measures included within the regulation effectively restricts vessels using demersal whitefish gears to the equivalent of 14 to 15 days a month at sea.

5.5 Shellfish Entitlements

As previously stated, licenses were introduced during 2004 for vessels targeting crabs and lobster. Shellfish entitlements were issued to owners of licensed vessels with a track record (between 1st January 1998 and 31st March 2004) of landing over a particular weight of these species per year (200kg lobster and 750kg crab). This entitlement allowed unrestricted amounts of crab and lobster to continue to be caught. Vessels that are under-10 metres and have a shellfish entitlement must submit weekly log sheets for crab and lobster landings to the local Fishery Office.

5.6 Scallop Dredging Restrictions

The scallop fishery is managed in the main through minimum landing sizes (100mm shell width), restrictions on dredge number and seasonal closures. There are no other limits in the form of catch or effort quota. Restrictions on the number of dredges that can be used depend upon the distance the vessel is operating from the coast. In Scottish waters, vessels are allowed up to 8 dredges per side inside 6nm; 10 dredges per side between 6 and 12nm and 14 dredges per side outside 12nm. In English waters, there are no restrictions outside 6nm (pers. comm. scallop fisherman, December 2010).

5.7 Regional and Local Fishing Restrictions

In Scottish waters, in addition to restrictions upon fishing activities transposed from EU and UK law, there is Scottish specific legislation, known as Statutory Instruments (SIs). SIs are a form of secondary legislation in Scotland, created by the Scotland Act 1998 and used to exercise devolved powers.

Figure 5.3 below shows the SIs in the regional study area and are contained within the Inshore Fishing (Prohibition of Fishing and Fishing Methods) (Scotland) Order 2004, No. 276 SI. There are three SIs in the Moray Firth, all located within the Inner Firth, well inshore of the wind farm boundary. In each instance, the use of mobile or active gear (except dredging, but not suction dredging for mussels in the Dornoch Firth and mussels and cockles in the Cromarty and Inverness Firths) is prohibited.

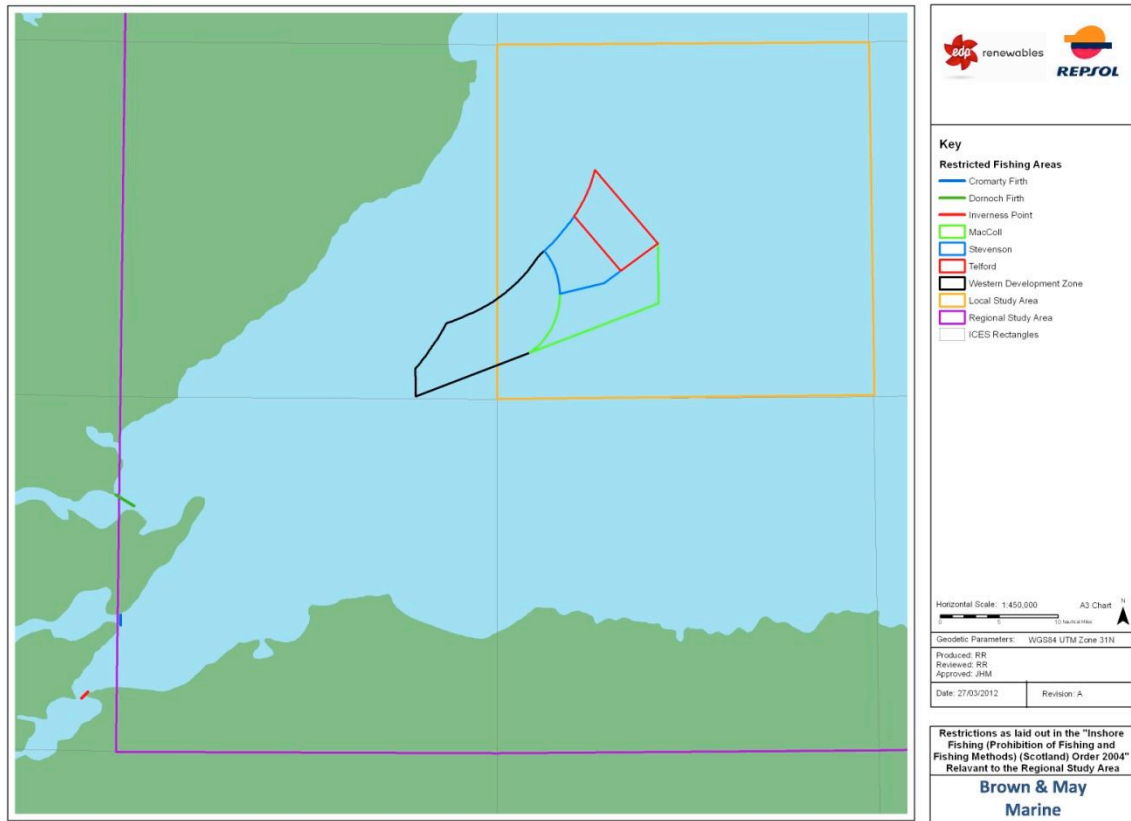


Figure 5.3 SI Restrictions upon Inshore Fishing Activities Relevant to the Regional Study Area

6.0 MMO Fisheries Statistics (Landings Values and Effort Data Sets)

As has been previously stated, it should be recognised that the fisheries statistics analysed below are collated by ICES rectangle. An individual rectangle encompasses a comparatively large sea area (approximately 900nm² in open sea areas) relative to the area of the MORL Eastern Development. It should be noted that landings values are recorded within a single rectangle and not specific to a location within that rectangle. As a result, it is likely that fishing activity is not evenly spread across a rectangle and species will instead be targeted at more discrete locations within the area.

6.1 Landings Values

6.1.1 National Overview

Figure 6.1 and Figure 6.2 display the total landings values (averaged 2000 to 2009) by species and method in the national study area, respectively. The figures demonstrate that the ICES rectangle within which the MORL Eastern Development is located (45E7) contain fishing grounds that are of moderate importance on a national scale and that the majority of landings in 45E7 are comprised of boat dredged King scallops.

Figure 6.3 shows scallop landings on a national scale. Scallop landings in rectangle 45E7 are the highest on the east coast of Scotland and comparable to productive grounds on the west coast.

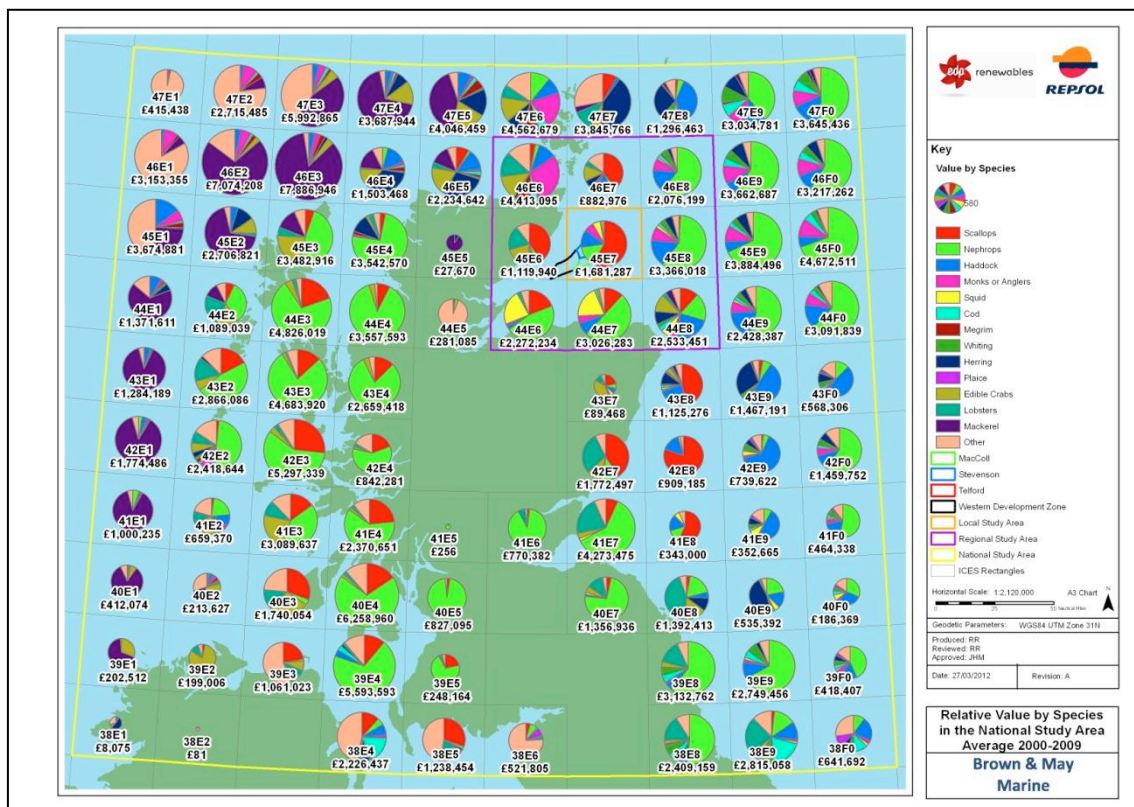


Figure 6.1 Landings Values by Species (average 2000 to 2009) in the National Study Area (Source: MMO)

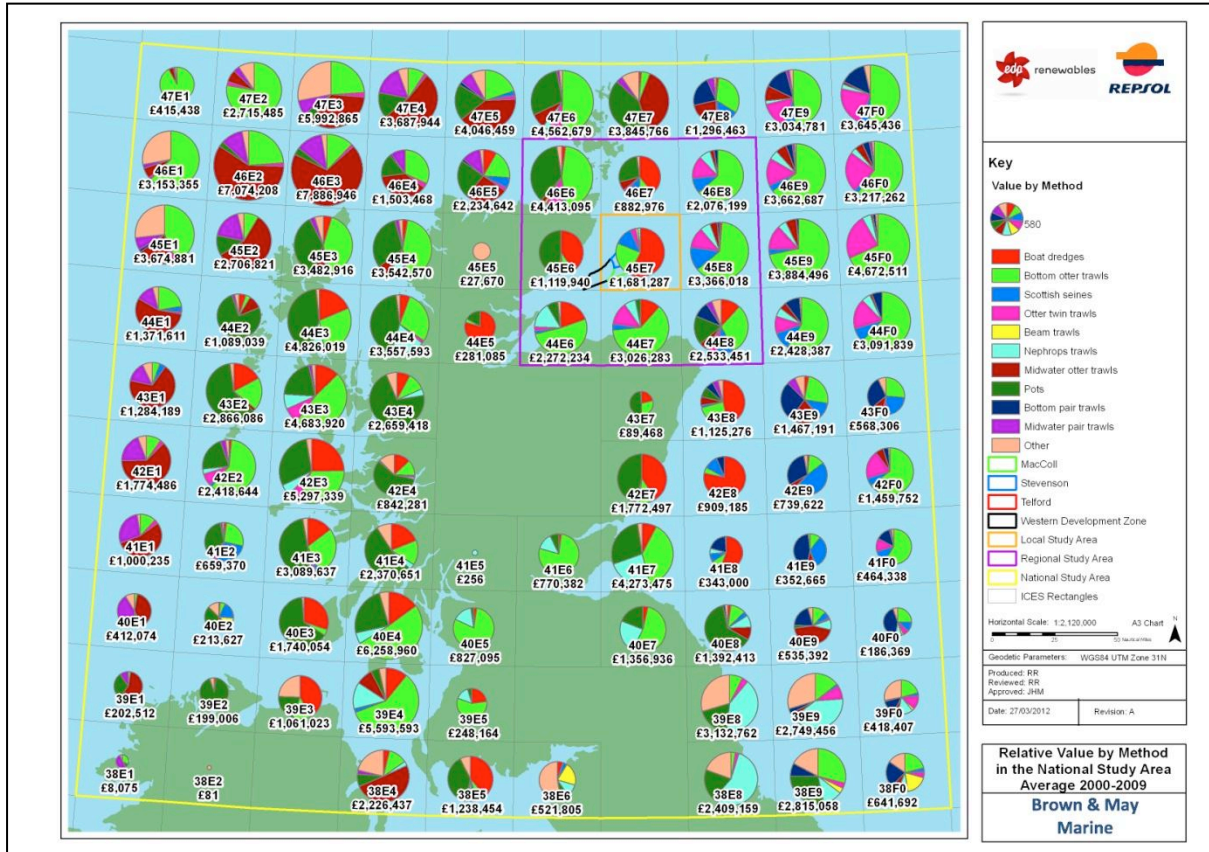


Figure 6.2 Landings Values by Method (average 2000 to 2009) in the National Study Area (Source: MMO)

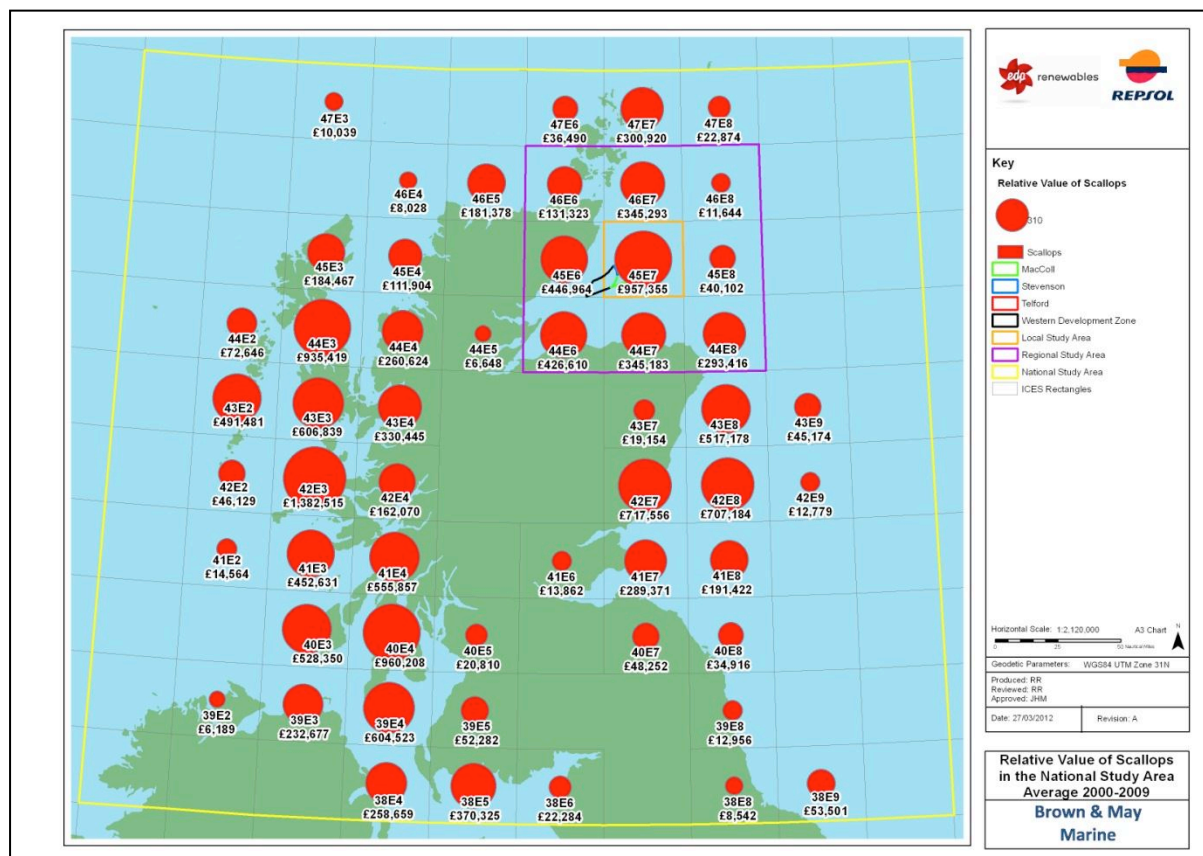


Figure 6.3 Landings Values of Scallops only (average 2000 to 2009) in the National Study Area (Source: MMO)

6.1.2 Regional Overview

Figure 6.4 and Figure 6.5 illustrate the landings values in the regional study area (averaged 2000 to 2009) by species and method, respectively. King scallops targeted by boat dredges comprise the majority of landings along the Caithness coast, in the central rectangle within which the Eastern Development is located and in 46E7 to the north.

Landings for *Nephrops* are high to the south and east of the regional area and are principally targeted by demersal otter trawlers. In the data set provided by the MMO, trawlers for *Nephrops* are variously listed as demersal otter trawlers and *Nephrops* trawlers (the same category of vessel), as well as by twin rigs (demersal otter trawlers configured to tow two nets). Static gear vessels operating pots in inshore waters also target *Nephrops*, but this method produces considerably lower recorded levels of landings.

Whitefish such as haddock and monks (anglers), record comparatively high landings values in the eastern section of the regional study area and to a lesser extent in the central rectangles. The whitefish fishery is targeted by demersal otter trawlers and Scottish seine netters. Landings of squid from the southern, inshore rectangles 44E6 and 44E7 should be noted, as the fishery is considered to be increasingly important in the Moray Firth. The species is recorded at lower levels throughout the remaining regional study area, including in rectangle 45E7.

There are limited landings of crustaceans such as crab and lobster, which are principally recorded in coastal rectangles.

Figure 6.6 shows that the majority of the vessels are over-15. Lower levels of activity are undertaken by vessels of 10-15 metres and under-10 metres, with the under-10 metre fleet predominantly being recorded in coastal rectangles. There is negligible recorded foreign vessel activity.

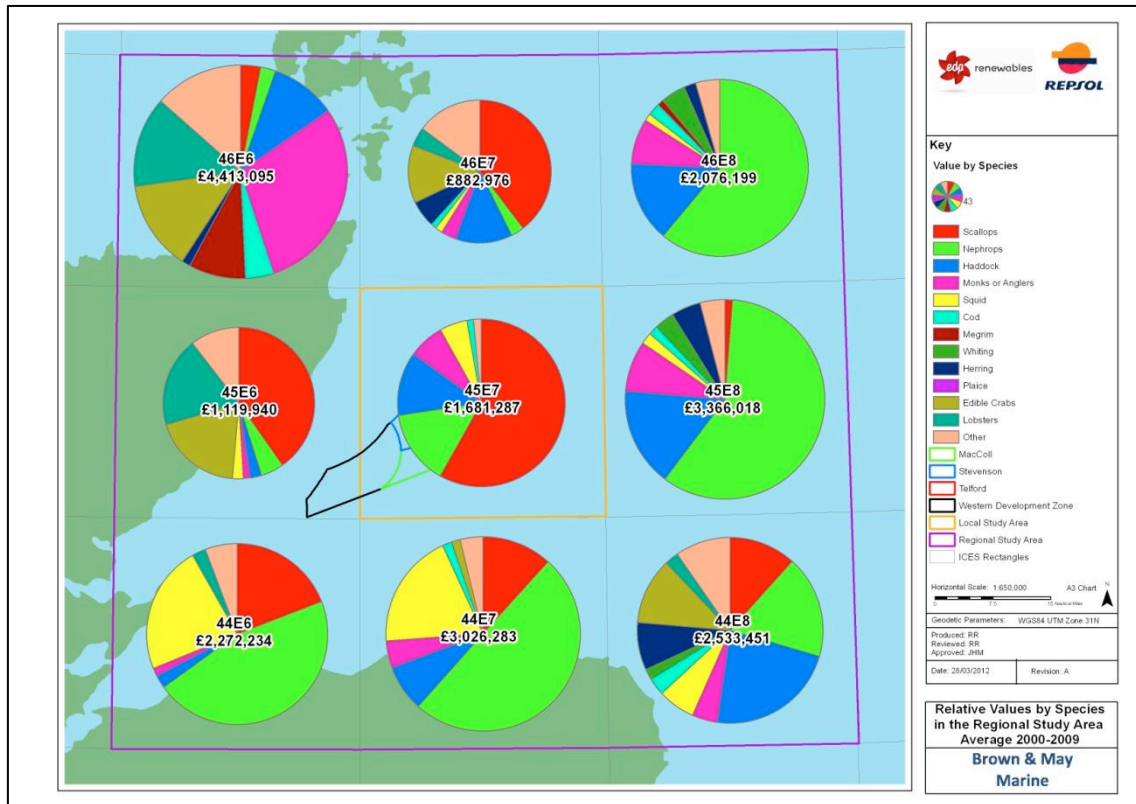


Figure 6.4 Landings Values by Species (average 2000 to 2009) in the Regional Study Area (Source: MMO)

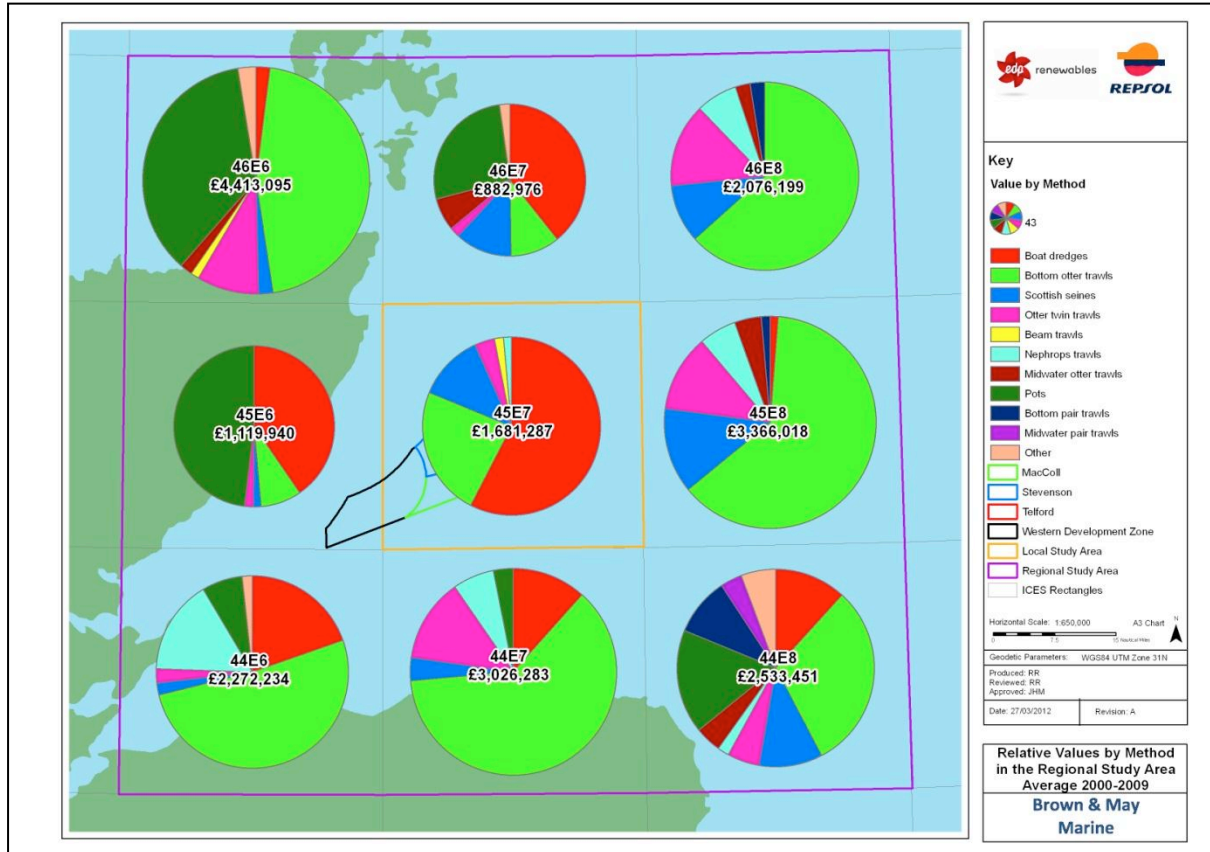


Figure 6.5 Landings Values by Method (average 2000 to 2009) in the Regional Study Area (Source: MMO)

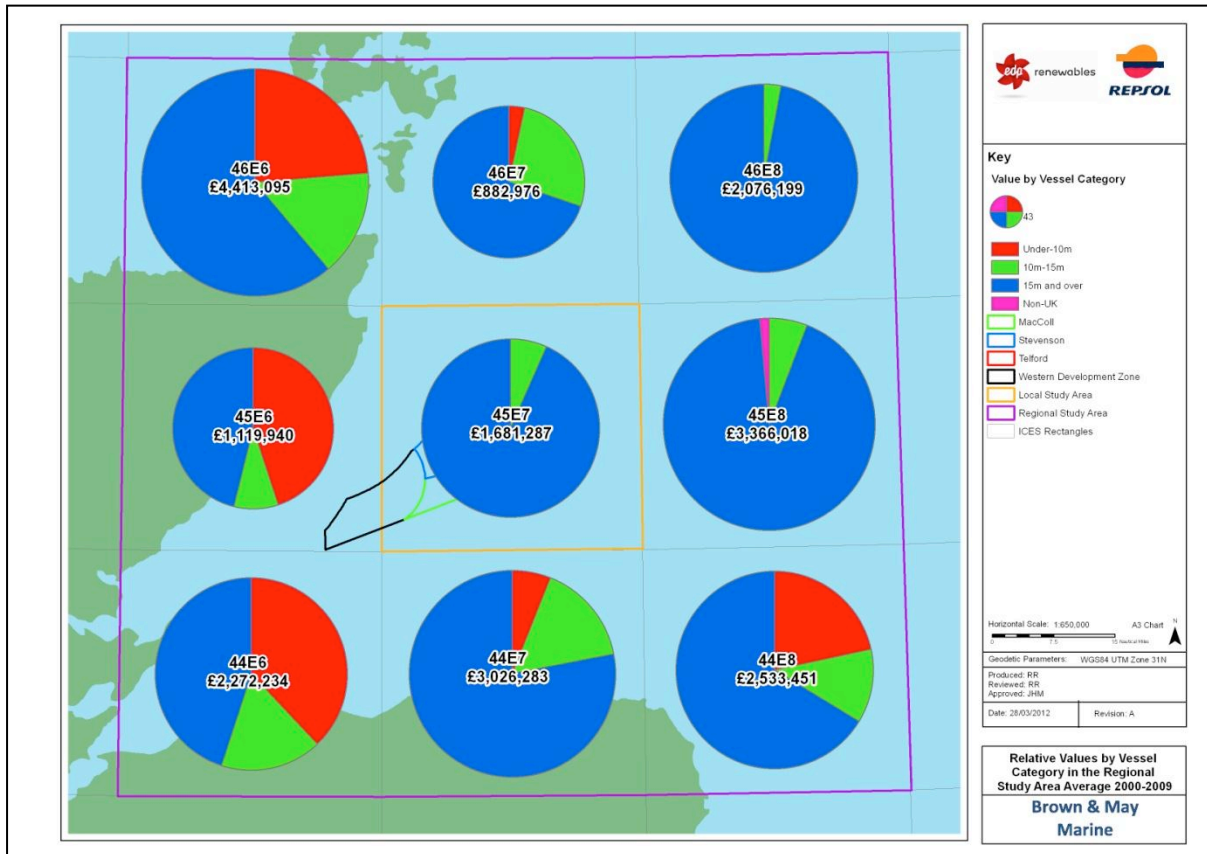


Figure 6.6 Landings Values by Vessel Category (average 2000 to 2009) in the Regional Study Area (Source: MMO)

6.1.3 Local Study Area (ICES Rectangle 45E7)

Figure 6.7 below shows that scallops represent the highest landings values in rectangle 45E7 (57% of the total). The remainder of landings values are principally comprised of *Nephrops* (14%), haddock (12%), monks (7%) and squid (5%).

As has been previously stated, Figure 6.8 indicates that boat dredges are the sole fishing method targeting King scallops. Bottom otter trawlers (including *Nephrops* trawlers) principally target *Nephrops*, however a small proportion of landings are targeted by twin rig otter trawlers. Generally, monks and squid are also targeted by demersal otter trawl vessels. Haddock is principally targeted by Scottish seine netters, although a small percentage is caught by bottom otter trawlers.

Figure 6.9 illustrates that the large majority of scallop dredges, Scottish seine netters and demersal otter trawlers are over-15 metres in length. A small percentage of dredgers and trawlers are 10-15m in length, with little recorded activity by the under-10 metre fleet. A negligible proportion of the fleet is recorded as being non-UK.

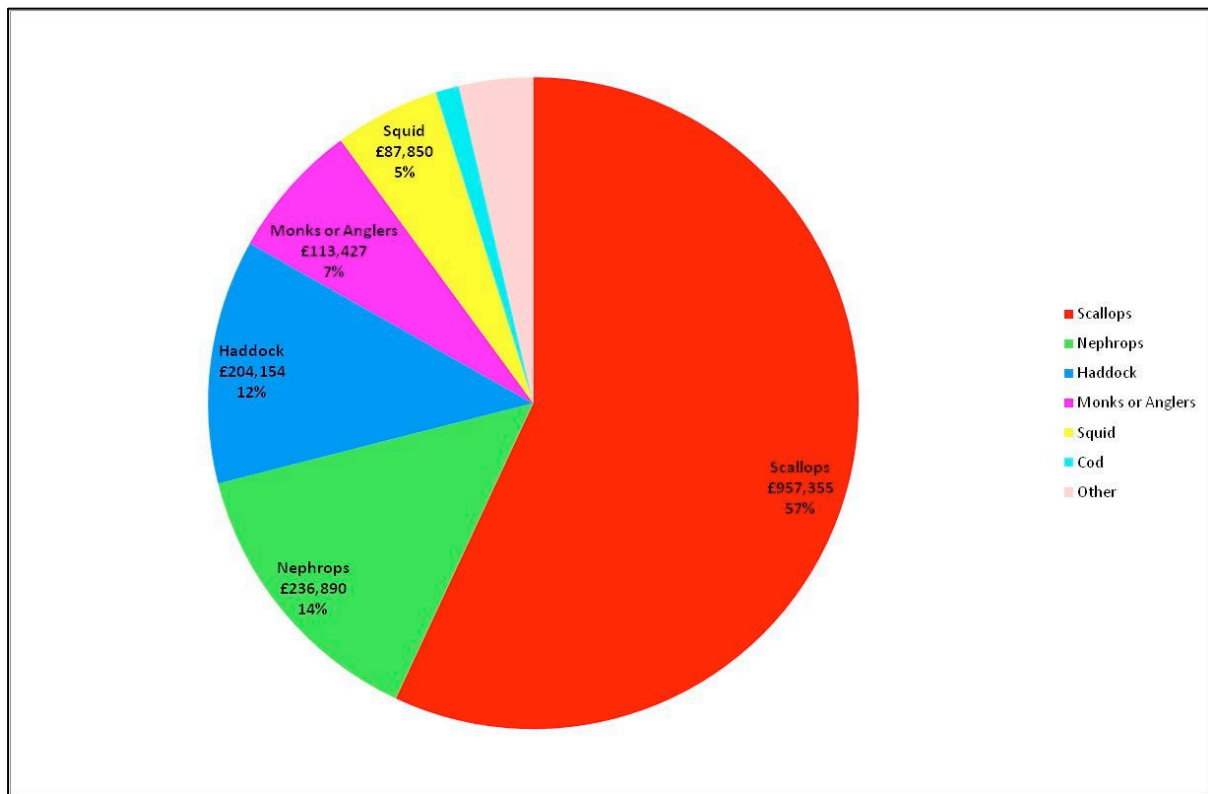


Figure 6.7 Percentage Distribution of Landings Values by Species in ICES Rectangle 45E7 (Source: MMO)

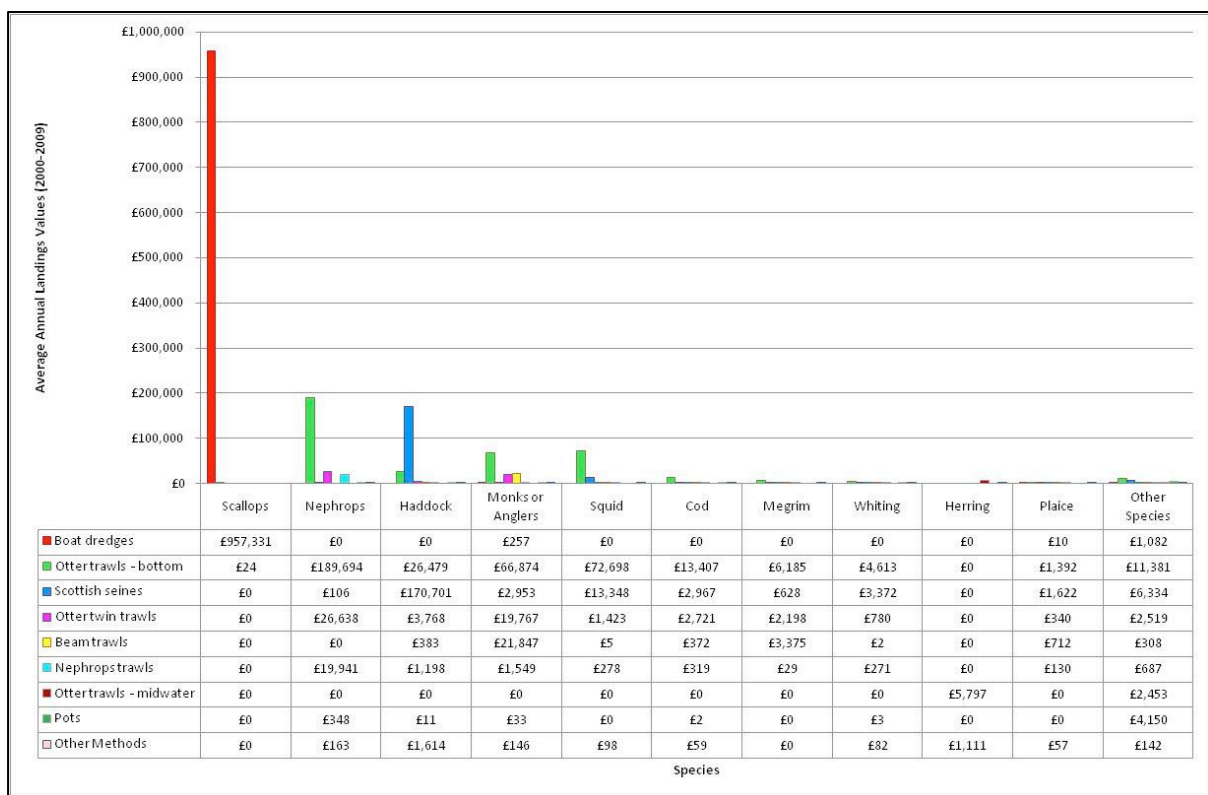


Figure 6.8 Average Annual Landings Values (average 2000 to 2009) by Species and Methods in ICES Rectangle 45E7 (Source: MMO)

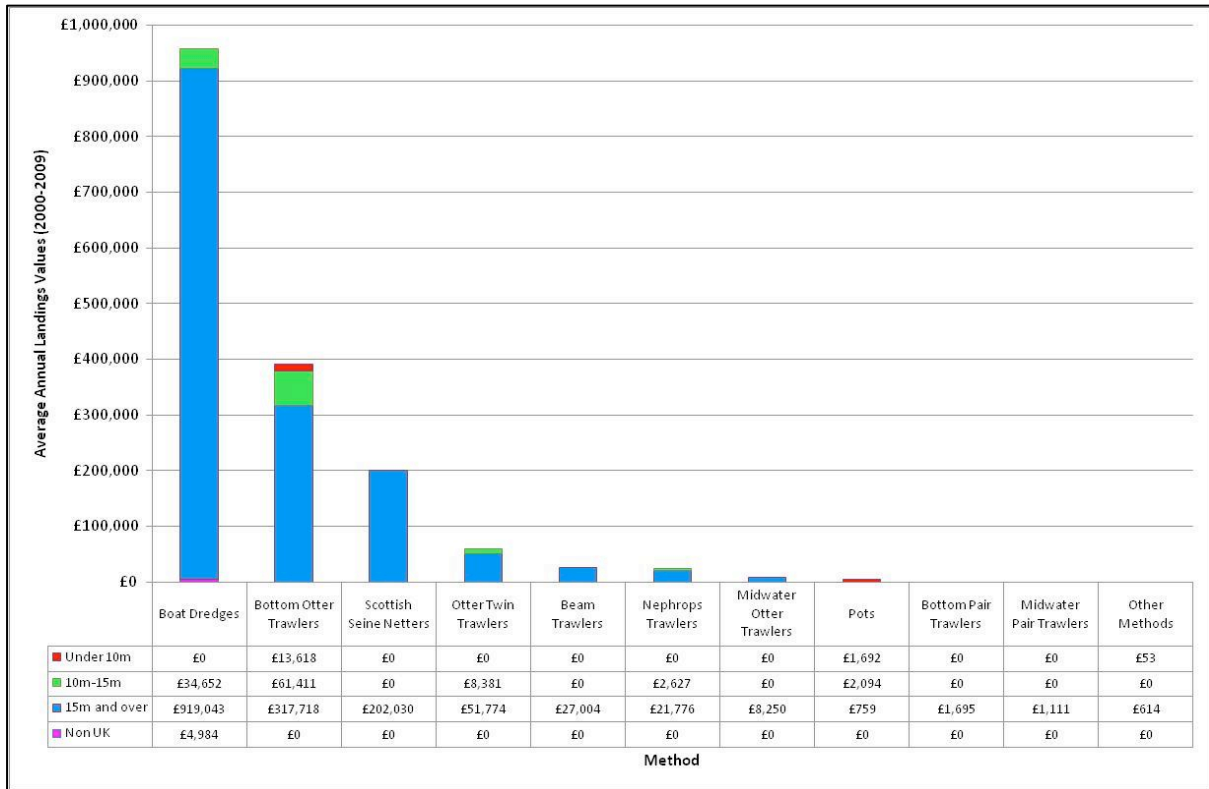


Figure 6.9 Average Annual Landings Values (average 2000 to 2009) by Methods and Vessel Length in ICES Rectangle 45E7 (Source: MMO)

6.1.3.1 Annual Landings

Figure 6.10 shows the annual variations in landings values by species. It can be seen that landings values for all species have been broadly consistent over the ten year period although a decline was recorded during 2002 as a result of a drop in scallop landings. The highest total value for the period occurred in 2009 due to the high landings recorded from the squid fishery during this period (£566,765). Fluctuations in squid landings throughout the period should be noted.

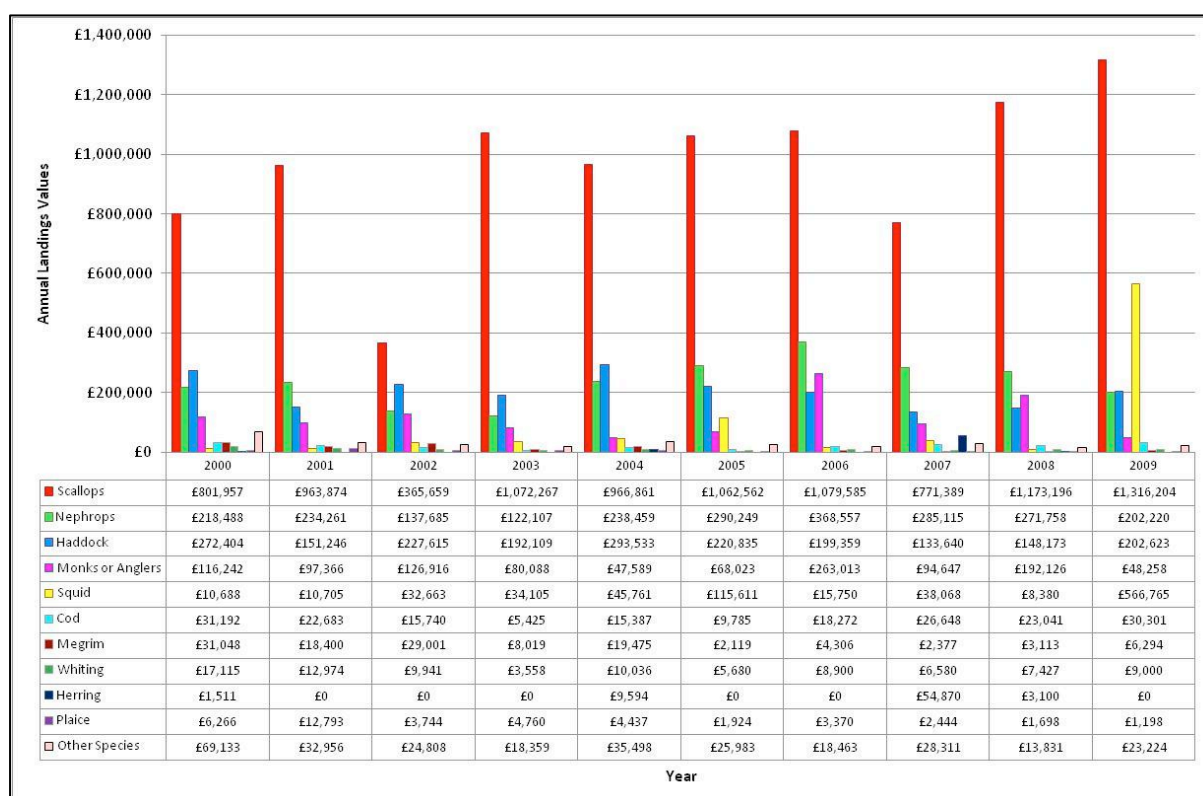


Figure 6.10 Annual Variations in Landings Values of Species in ICES Rectangle 45E7 (Source: MMO)

6.1.3.2 Seasonality

Figure 6.11 demonstrates the seasonal trend of landings for all species in rectangle 45E7. Landings are highest between May and September, inclusive, with moderate landings recorded in April and October. The lowest landings values are recorded between November and March, inclusive. Within this broad seasonality pattern, there are individual species which show variations and only appear in the area on a seasonal basis. Herring, for example, is only landed during August whilst squid is generally targeted between August and December. Due to the increasing importance of squid in the Moray Firth and the high landings recorded during 2009, the seasonality of squid is separately discussed in more detail in Section 6.1.3.2.1.

Figure 6.12 to Figure 6.14 illustrate the seasonal variations in landings for the top three species in ICES Rectangle 45E7; scallops, *Nephrops* and haddock, respectively. Scallop and *Nephrops* landings generally conform to the broad seasonality pattern of highest landings between May and September and lowest landings during the winter months (although *Nephrops* record an increase in landings during November and December). The haddock fishery however, records broadly consistent levels throughout the year, with a decline in landings during August and an increase in landings recorded during the winter months.

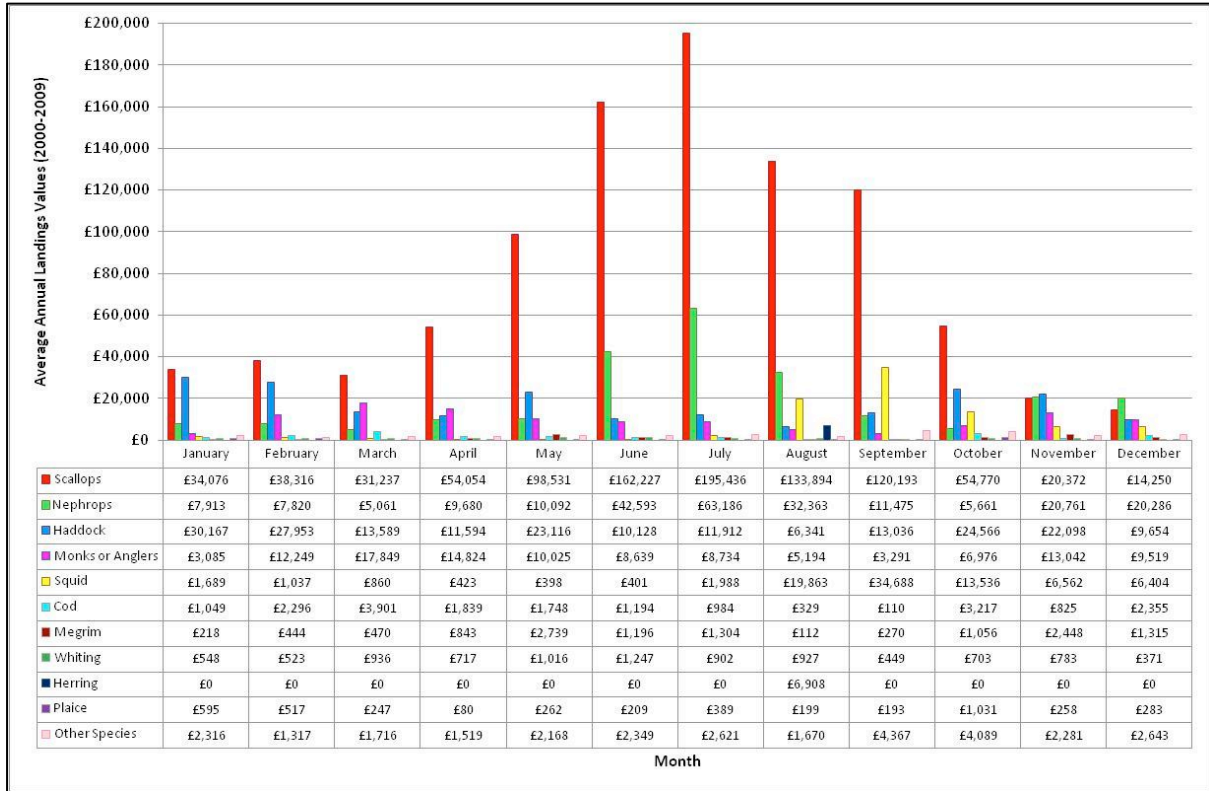


Figure 6.11 Average Annual (average 2000 to 2009) Seasonality of Species in ICES Rectangle 45E7 (Source: MMO)

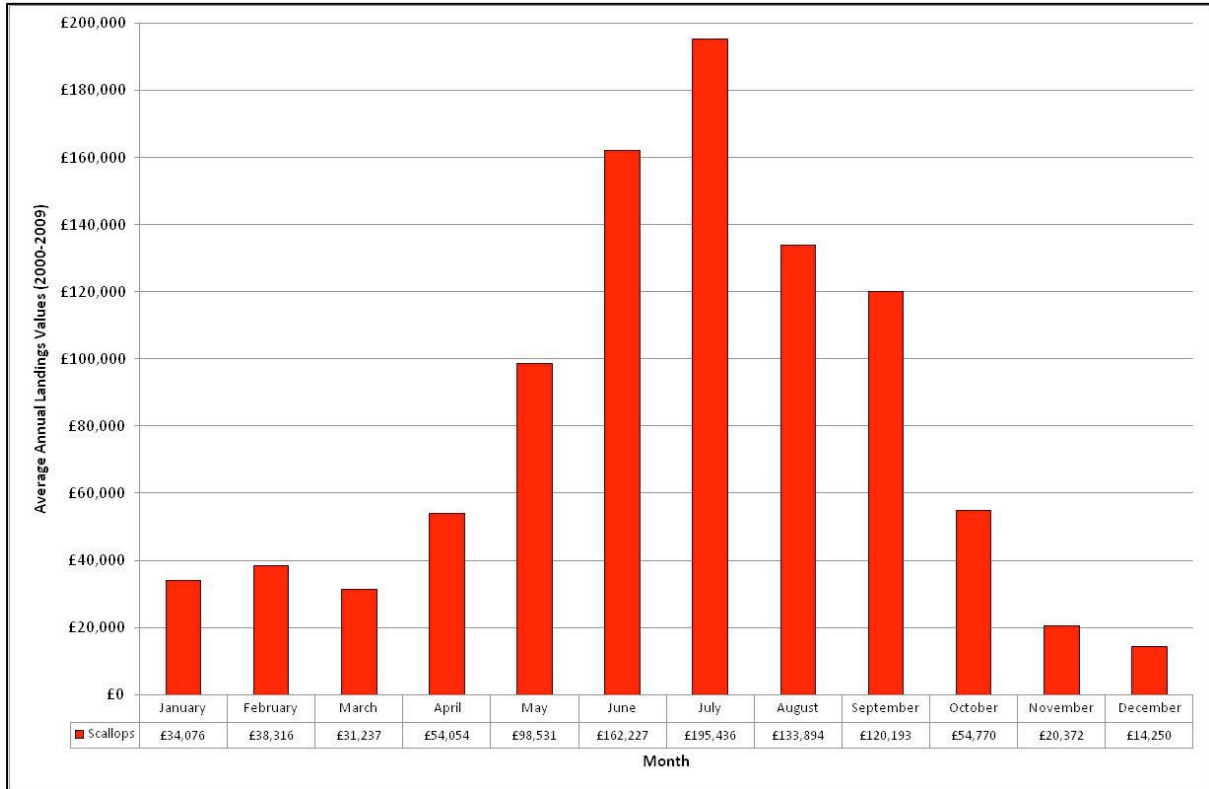


Figure 6.12 Average Annual (average 2000 to 2009) Seasonality of Scallops in ICES Rectangle 45E7 (Source: MMO)

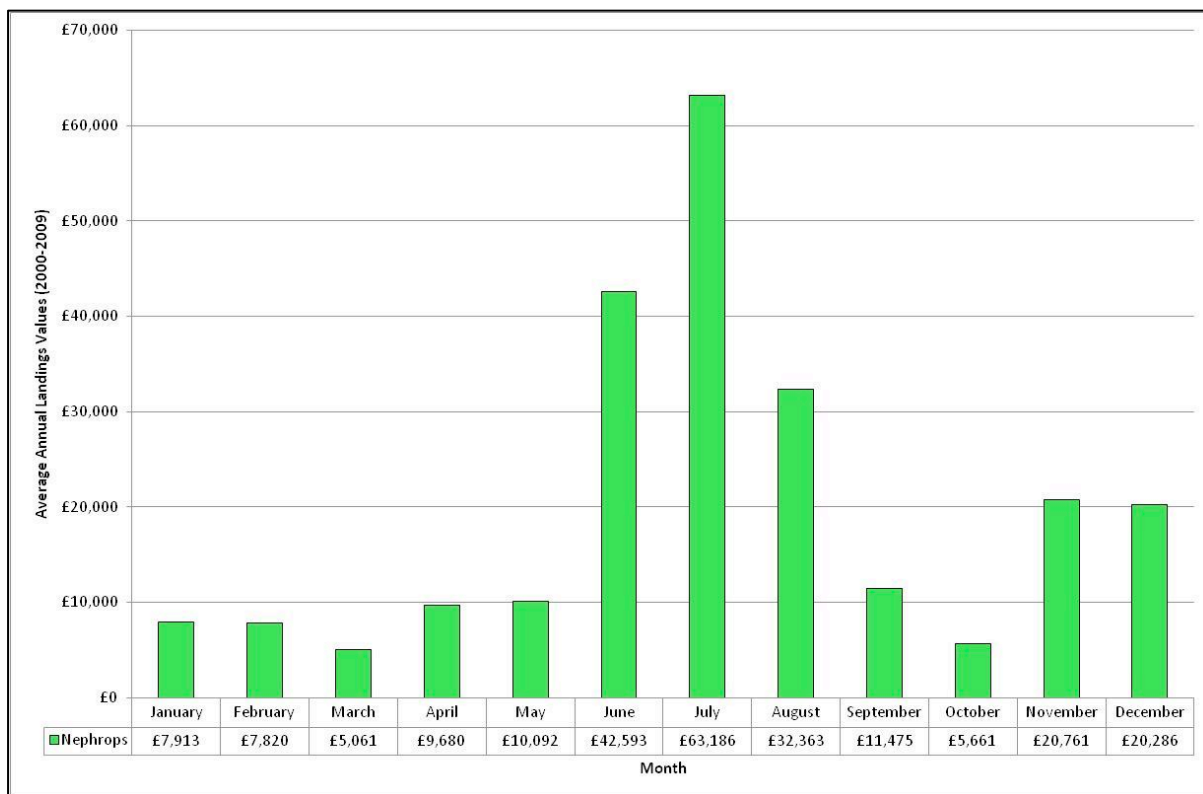


Figure 6.13 Average Annual (average 2000 to 2009) Seasonality of *Nephrops* in ICES Rectangle 45E7 (Source: MMO)

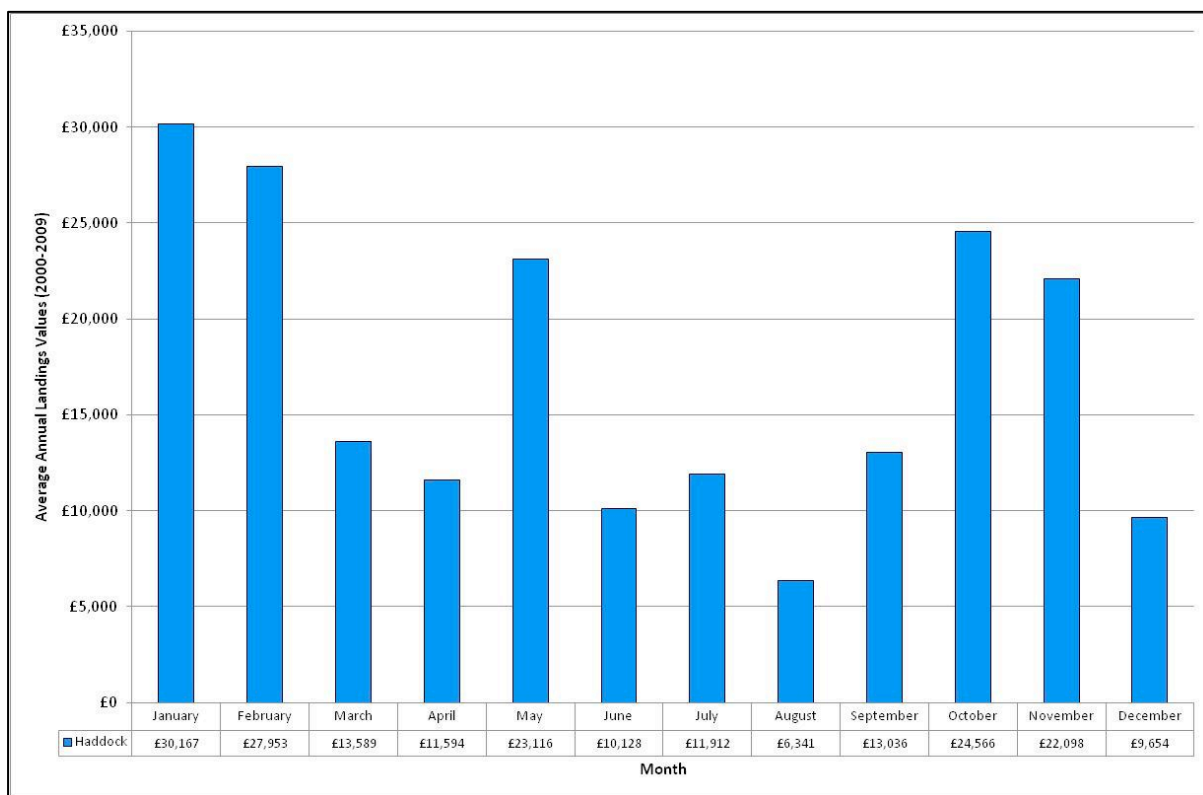


Figure 6.14 Average Annual (average 2000 to 2009) Seasonality of Haddock in ICES Rectangle 45E7 (Source: MMO)

6.1.3.2.1 2009 Squid Fishery

As mentioned previously, the squid fishery is increasingly important to the Moray Firth. There were relatively high landings of squid during 2009 and due to the short duration of this fishery and the potential of the fishery to generate similar levels in the future, Figure 6.15 below illustrates the seasonality of squid during the 2009 period.

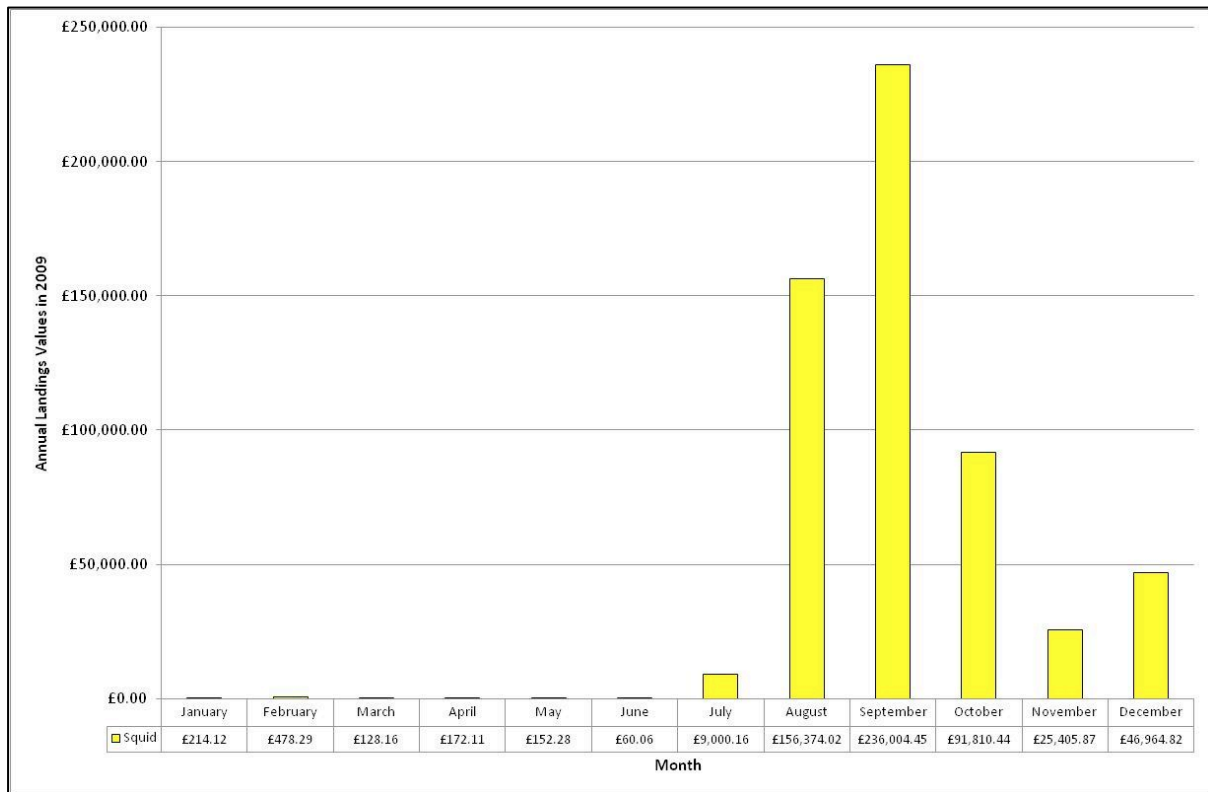


Figure 6.15 Seasonal Landings of Squid during 2009 in ICES Rectangle 45E7 (Source: MMO)

6.1.4 Landings Values by Port

Table 6.1 lists the top 20 ports in the area by landings values from 45E7 and the percentage of the ports' total income that this represents. Percentages have been rounded to the nearest one decimal place. Although the highest percentage of landings is into the port at Fraserburgh (43%), it should be noted that this rectangle only contributes to 1.8% of the port's total annual income. The ports of Buckie, Wick and Whitehills, however, have lower percentages of the total landings values from 45E7 but landings from this rectangle contribute 12.6%, 16% and 14.7% of their total average annual values, respectively.

Table 6.1 Top 20 Ports by Landings Value from ICES Rectangle 45E7 (Source: MMO)

Port	Average Annual Landings Values in 45E7 (2000-2009)	% of Annual Value in 45E7	Total Average Annual Port Value (2000-2009)	% of Total Annual Port Value that 45E7 represents
Fraserburgh	£722,924	43.0%	£40,502,160	1.8%
Buckie	£403,617	24.0%	£3,200,018	12.6%
Wick	£213,519	12.7%	£1,338,177	16.0%
Peterhead	£128,460	7.6%	£85,703,602	0.1%
Macduff	£87,228	5.2%	£1,412,012	6.2%
Scrabster	£36,476	2.2%	£27,259,287	0.1%
Aberdeen	£17,612	1.0%	£12,482,442	0.1%
Lochinver	£14,799	0.9%	£34,115,956	0.0%
Kinlochbervie	£13,441	0.8%	£9,028,010	0.1%
Ullapool	£11,439	0.7%	£13,227,524	0.1%
Whitehills	£9,522	0.6%	£64,636	14.7%
Mallaig	£6,959	0.4%	£8,708,546	0.1%
Lossiemouth	£4,329	0.3%	£169,247	2.6%
Unspecified Faroese	£2,453	0.1%	£1,200,038	0.2%
Stromness	£1,692	0.1%	£903,950	0.2%
Helmsdale	£1,522	0.1%	£206,345	0.7%
Inverness	£811	0.0%	£82,352	1.0%
Snizort	£742	0.0%	£1,267,705	0.1%
Rosehearty	£633	0.0%	£15,222	4.2%
Lerwick	£535	0.0%	£43,180,318	0.0%

6.2 Effort (Days at Sea)

6.2.1 Regional Overview

Figure 6.16 shows the average annual effort in the regional study area by fishing method. It can be seen that the pattern is similar to that described for the landings values: to the south and east of the Moray Firth, demersal otter trawlers (including *Nephrops* trawlers) comprise the majority of the activity; around the immediate area of the MORL Eastern Development, boat dredging is the principal activity, and in coastal areas, particularly 45E6 and 46E6, potting constitutes a large majority of fishing activity.

Figure 6.17 shows the average annual effort in the regional study area by vessel category. Again, the pattern seen in the figure is similar to that described for the landings values. The majority of vessels in the regional study area are over-15 metres in length, with lower levels of activity undertaken by vessels of 10-15 metres and under-10 metres. The under-10 metre fleet is predominately recorded in coastal regions.

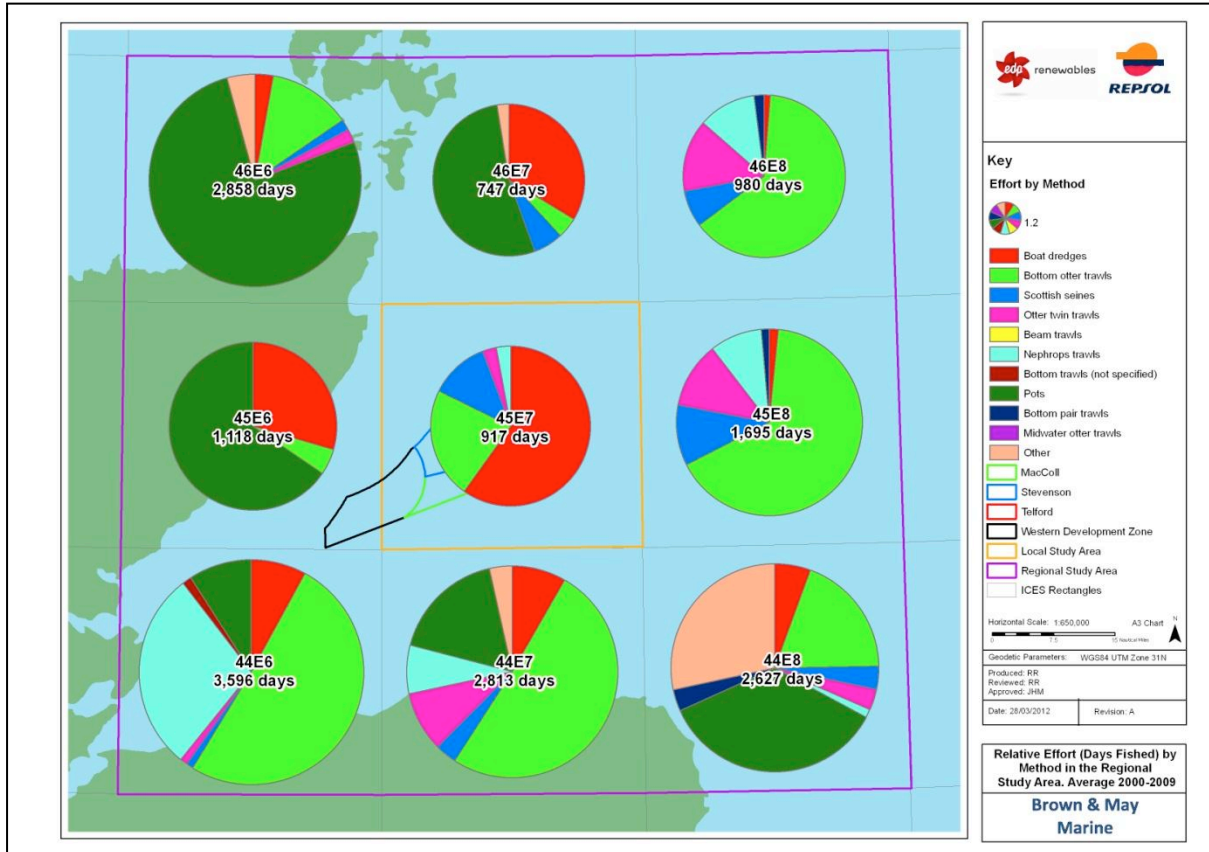


Figure 6.16 Effort (Days at Sea) by Fishing Method in the Regional Study Area (average 2000 to 2009) (Source: MMO)

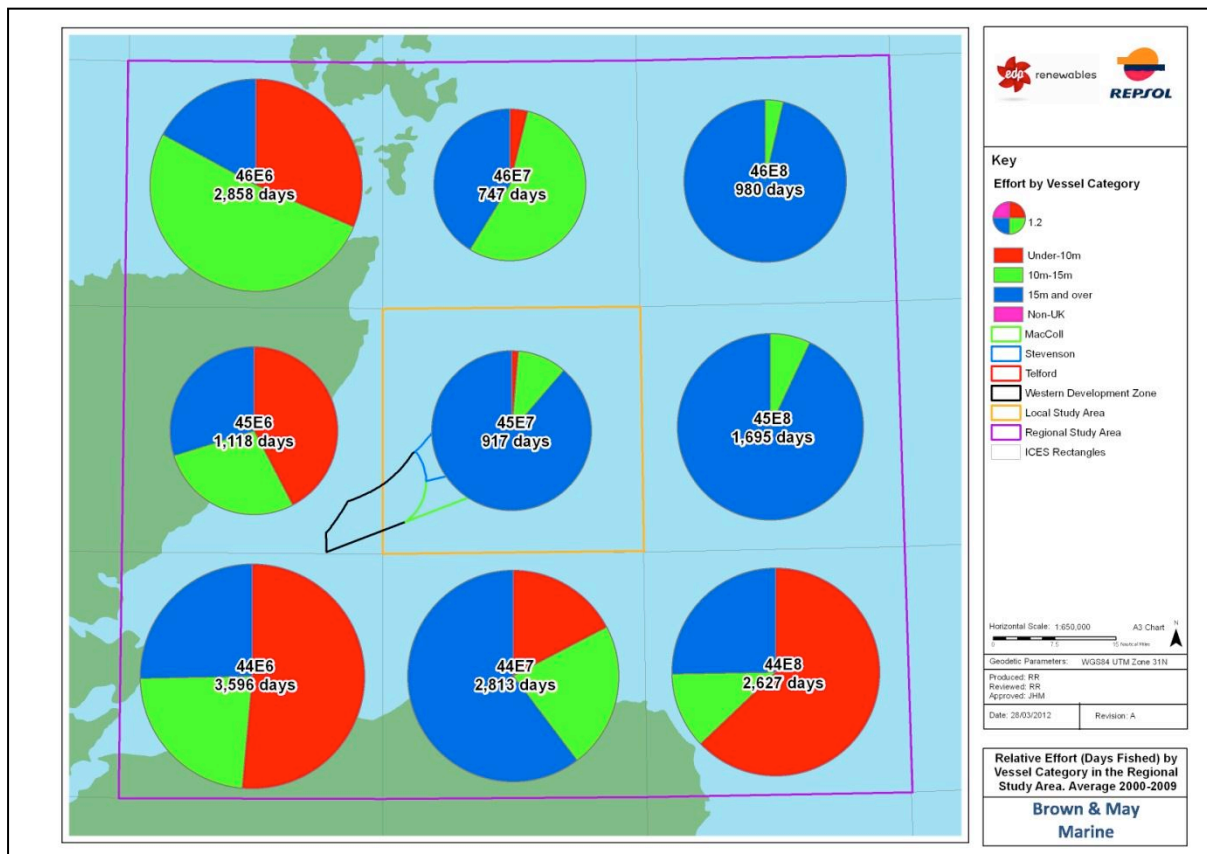


Figure 6.17 Effort (Days at Sea) by Vessel Category in the Regional Study Area (average 2000 to 2009) (Source: MMO)

6.2.2 Local Study Area (ICES Rectangle 45E7)

Figure 6.18 below shows the annual variations in effort (days fished) in 45E7. Effort made by the under-10 metre and 10-15 metre fleets generally increased over the ten year period, whereas effort made by the over-15 metre fleet has been decreasing. It is of note that recorded efforts by the under-10 metre fleet increased considerably in 2009 from previously very low levels. Figure 6.19 illustrates the average annual seasonality by effort in 45E7. The seasonality is similar to that demonstrated by the landings values seasonality data in Figure 6.11, with landings values highest between May and September, inclusive.

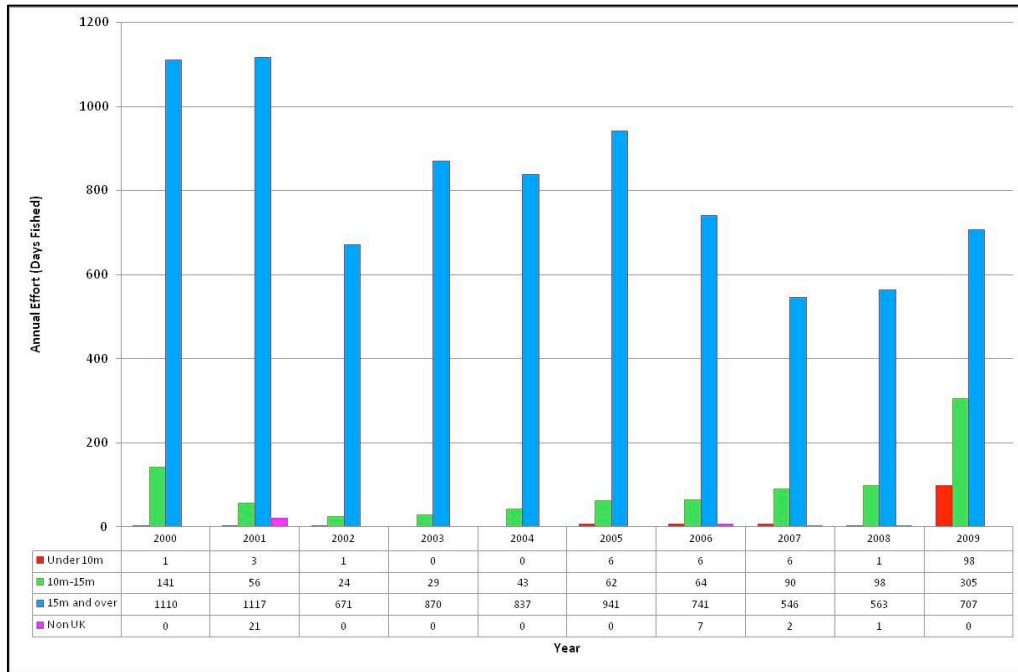


Figure 6.18 Annual Variations in Effort (Days Fished) by Vessel Category in ICES Rectangle 45E7 (Source: MMO)

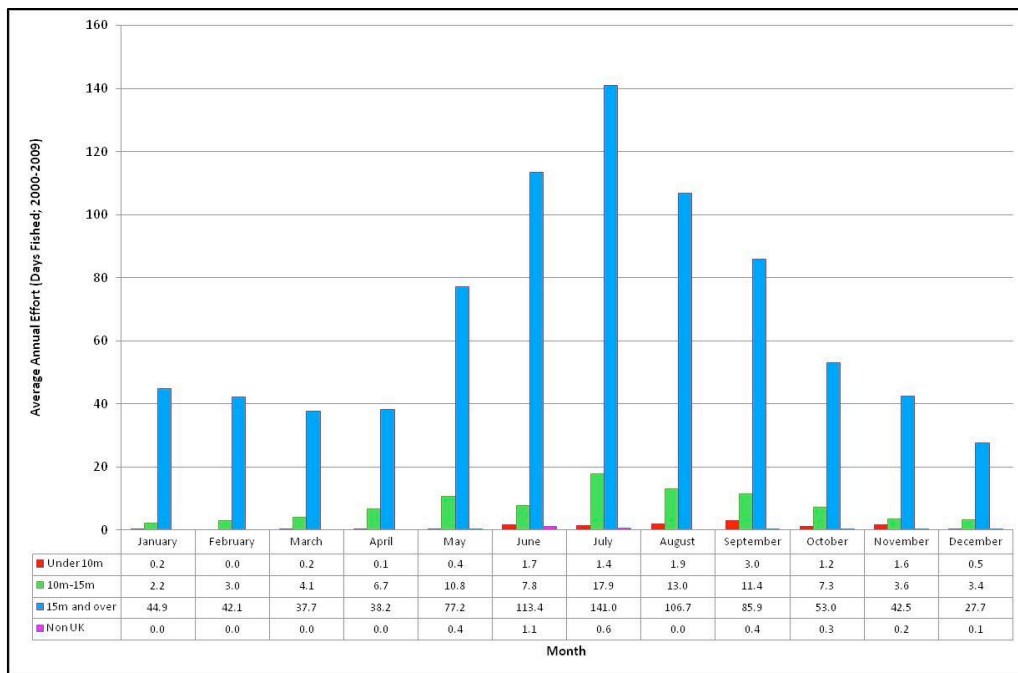


Figure 6.19 Average Annual (average 2000 to 2009) Seasonality by Effort (Days Fished) and Vessel Category in ICES Rectangle 45E7 (Source: MMO)

Table 6.2 lists the top 20 ports by the effort made in rectangle 45E7 and the percentage of the ports' total effort this represents. The data demonstrates similar patterns to the landings values data, with the highest percentage of effort made by vessels landing into Fraserburgh (39.4%), although again this only represents 2.1% of the port's total average effort. Vessels landing into the ports of Wick and Whitehills however, contribute relatively low percentages of the effort in 45E7, but the effort made by these vessels represents 15.2% and 10.9% of the port's total average effort, respectively.

Table 6.3 lists the effort made in 45E7 by each vessel category from each port over a ten year period. On average, the over-15 metre fleet contributes the most effort, followed by the 10-15 metre fleet. The majority of this effort is made by vessels landing into Fraserburgh. The under-10 metre fleet contributes little effort to the landings from 45E7, the majority of which is by vessels landing into Buckie. Non-UK vessels contribute negligible effort.

Table 6.2 Top 20 Ports by Effort (Days Fished) in ICES Rectangle 45E7 (Source: MMO)

Port	Average Annual Effort (Days Fished) in the 45E7 (2000-2009)	% of Annual Effort in 45E7	Total Average Annual Port Effort (Days Fished) (2000-2009)	% of Total Annual Port Effort 45E7 represents
Fraserburgh	361.1	39.4%	17415.4	2.1%
Buckie	251.6	27.4%	2815.3	8.9%
Wick	153.1	16.7%	1010.2	15.2%
Macduff	49.3	5.4%	950.0	5.2%
Peterhead	39.5	4.3%	16129.0	0.2%
Scrabster	20.8	2.3%	6795.5	0.3%
Aberdeen	12.1	1.3%	4983.1	0.2%
Whitehills	9.2	1.0%	84.2	10.9%
Lossiemouth	5.0	0.5%	307.6	1.6%
Mallaig	2.4	0.3%	8237.7	0.0%
Kinlochbervie	2.0	0.2%	3333.2	0.1%
Helmsdale	1.6	0.2%	312.7	0.5%
Lochinver	1.2	0.1%	8215.3	0.0%
Ullapool	1.1	0.1%	4432.8	0.0%
Lerwick	1.0	0.1%	5648.2	0.0%
Kirkwall	0.8	0.1%	90.2	0.9%
Inverness	0.8	0.1%	2056.4	0.0%
Snizort	0.7	0.1%	4236.4	0.0%
North Shields	0.7	0.1%	1283.0	0.1%
Rosehearty	0.4	0.0%	41.4	1.0%

Table 6.3 Annual Effort (Days Fished) by Port and Vessel Length in ICES Rectangle 45E7 (Source: MMO)

Port and Vessel Length	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	10 Year Average
15m and over											
Fraserburgh	305	444	175	349	325	469	336	276	247	348	327.4
Buckie	383	293	234	205	254	212	181	98	97	206	216.3
Wick	247	167	107	147	134	159	78	58	117	41	125.5
Macduff	39	86	17	61	35	18	59	53	62	17	44.7
Peterhead	39	31	36	33	52	32	56	20	29	64	39.2
Scrabster	25	45	29	17	15	25	19	14	3	8	20.0
Aberdeen	18	21	8	12	7	14	2	13	3	16	11.4
Whitehills	1	4	51	30	5	1	0	0	0	0	9.2
Lossiemouth	25	12	2	5	1	0	2	0	0	0	4.7
Mallaig	7	1	4	1	4	1	0	3	0	3	2.4
Other Ports	21	13	8	10	5	10	8	11	5	4	9.5
Total	1110	1117	671	870	837	941	741	546	563	707	810.3
10m-15m											
Fraserburgh	0	6	4	20	25	43	52	46	42	94	33.2
Buckie	104	0	0	0	0	5	1	2	4	149	26.5
Wick	34	45	15	9	11	8	7	39	47	33	24.8
Macduff	0	0	4	0	0	0	3	0	0	25	3.2
Scrabster	0	0	0	0	4	0	0	0	4	0	0.8
Aberdeen	0	0	0	0	0	4	0	0	0	0	0.4
Snizort	0	2	0	0	1	0	0	0	0	0	0.3
Helmsdale	0	3	0	0	0	0	0	0	0	0	0.3
Stromness	0	0	0	0	0	0	0	2	0	1	0.3
Lossiemouth	3	0	0	0	0	0	0	0	0	0	0.3
Other Ports	0	0	1	0	2	2	1	1	1	3	1.1
Total	141	56	24	29	43	62	64	90	98	305	91.2
Under-10m											
Buckie	0	0	0	0	0	1	3	0	1	79	8.4
Macduff	0	0	0	0	0	0	0	0	0	11	1.1
Inverness	0	0	0	0	0	0	0	4	0	4	0.8
Wick	1	2	0	0	0	1	1	2	0	0	0.7
Fraserburgh	0	0	0	0	0	0	2	0	0	3	0.5
Brora	0	0	0	0	0	3	0	0	0	0	0.3
Helmsdale	0	1	1	0	0	0	0	0	0	1	0.3
Peterhead	0	0	0	0	0	1	0	0	0	0	0.1
Total	1	3	1	0	0	6	6	6	1	98	12.2
Non UK											
Wick	0	21	0	0	0	0	0	0	0	0	2.1
Buckie	0	0	0	0	0	0	4	0	0	0	0.4
Aberdeen	0	0	0	0	0	0	0	2	1	0	0.3
Macduff	0	0	0	0	0	0	3	0	0	0	0.3
Total	0	21	0	0	0	0	7	2	1	0	3.1
Grand Total	1252	1197	696	899	880	1009	818	644	663	1110	916.8

7.0 MMO UK Satellite Tracking (VMS) Data

UK satellite data were obtained from the MMO and Marine Scotland in comma separated variable (CSV) format. The 2005 to 2008 data gave individual VMS position plots that have been converted into a density chart grid with each square measuring approximately 1nm². The 2009 data, as a result of restrictions on the release of data, have been provided as counts within one sixteenth of an ICES rectangle.

Due to the differences in data provided for satellite tracked vessels in 2009 (discussed in Section 4.8.2); Section 7.2.2 below will separately discuss the activity for this period.

As mentioned previously, satellite data is only indicative of the activity of vessels over-15 metres in length. The above analysis of landings and effort data has demonstrated that the majority of activity in 45E7 is by the over-15 metre fleet and therefore it can be considered that the data presented below will be representative of the activity of these vessels.

7.1 National Overview

Figure 7.1 illustrates the average satellite (VMS) density of all UK vessels over-15 metres (2005 to 2008). The areas of the highest density are concentrated along the west coast and offshore in the north east. There is moderate to high density of activity in the Moray Firth, particularly in the south.

7.2 Regional Study Area

7.2.1 2005 to 2008 Data

Figure 7.2 shows the average relative density of all UK vessels over-15 metres (2005 to 2008). The highest density of activity is to the south of the area, followed by the area offshore to the east. Activity is low to moderate in the local study area and within the boundary of the MORL Eastern Development.

7.2.2 2009 Data

Figure 7.3 shows the satellite density of all UK vessels over-15 metres during 2009. The patterns are broadly consistent with the 2005 to 2008 data sets. Figure 7.4 to Figure 7.7 provide a breakdown of density by gear type, which was not possible to achieve with the previous years' data sets, categorising density by dredges, *Nephrops* gear, whitefish gear and 'other' gear types, respectively.

The highest densities of scallop dredge vessels (Figure 7.4) occur in grounds to the southeast and north of the regional study area. Coastal areas and grounds to the south record moderate densities while the north-eastern section of the area records low activity. Activity within the MORL Eastern Development is high.

Nephrops activity is low within the MORL Eastern Development. The main *Nephrops* grounds are to the south and northeast (Figure 7.5).

Activity for whitefish is low to moderate within the MORL Eastern Development. The majority of the activity occurs further offshore to the east and to the northwest (Figure 7.6).

Figure 7.7 illustrates the activities of 'other' gear type vessels; either unregulated trawl gear or hand-fishing. As it is highly unlikely that vessels over-15 metres will be hand-fishing, it is probable that these vessels are using trawl gear for squid, which is an unregulated fishery. Within the regional area, the highest densities occur in inshore areas in the south of the Moray Firth. Within the MORL Eastern Development, activity is low to moderate in the northern portion of the site and high in the southern portion.

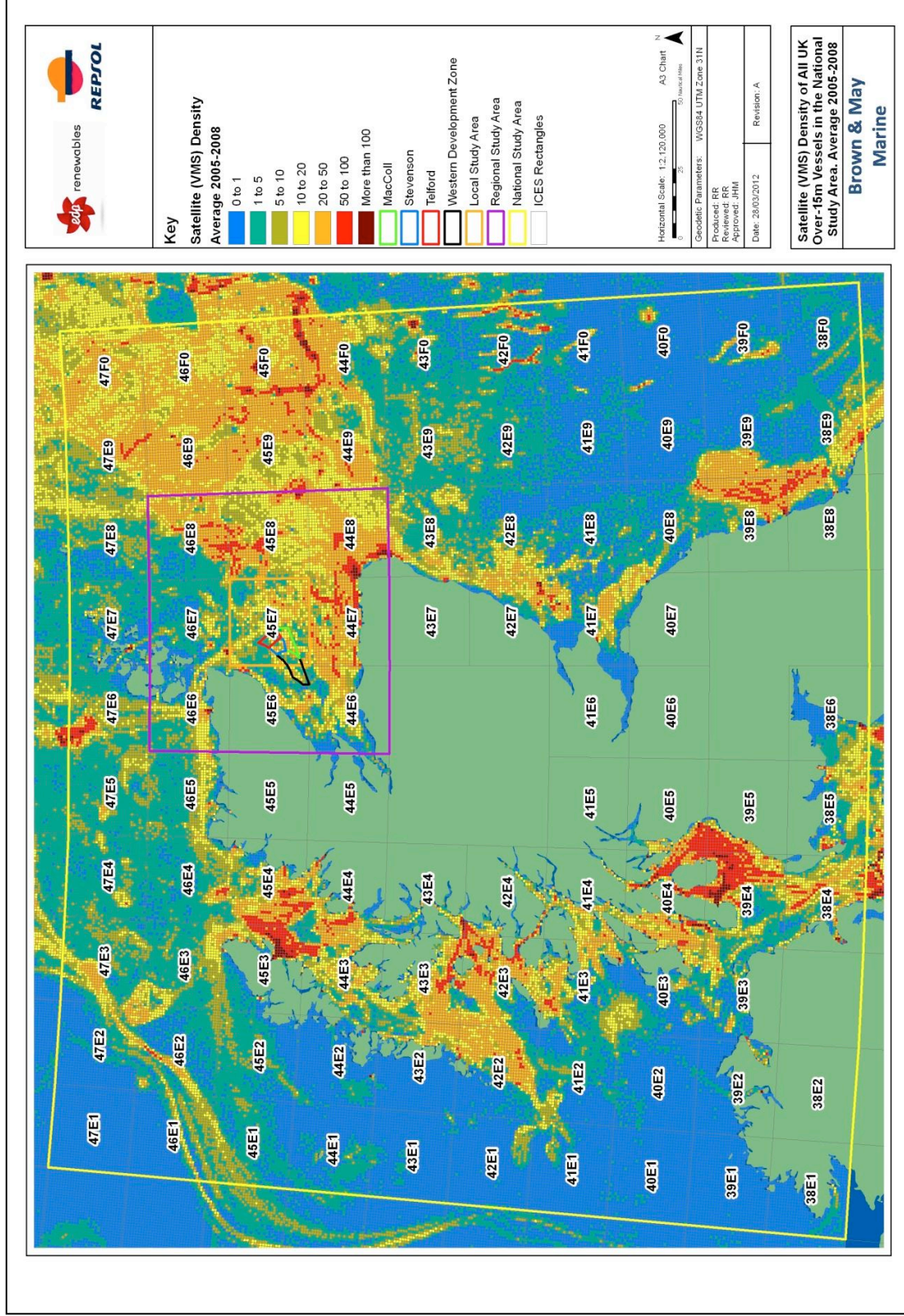


Figure 7.1 Satellite (VMS) Density of all UK Over-15 Metre Vessels (average 2005-2008) (Source: MMO)

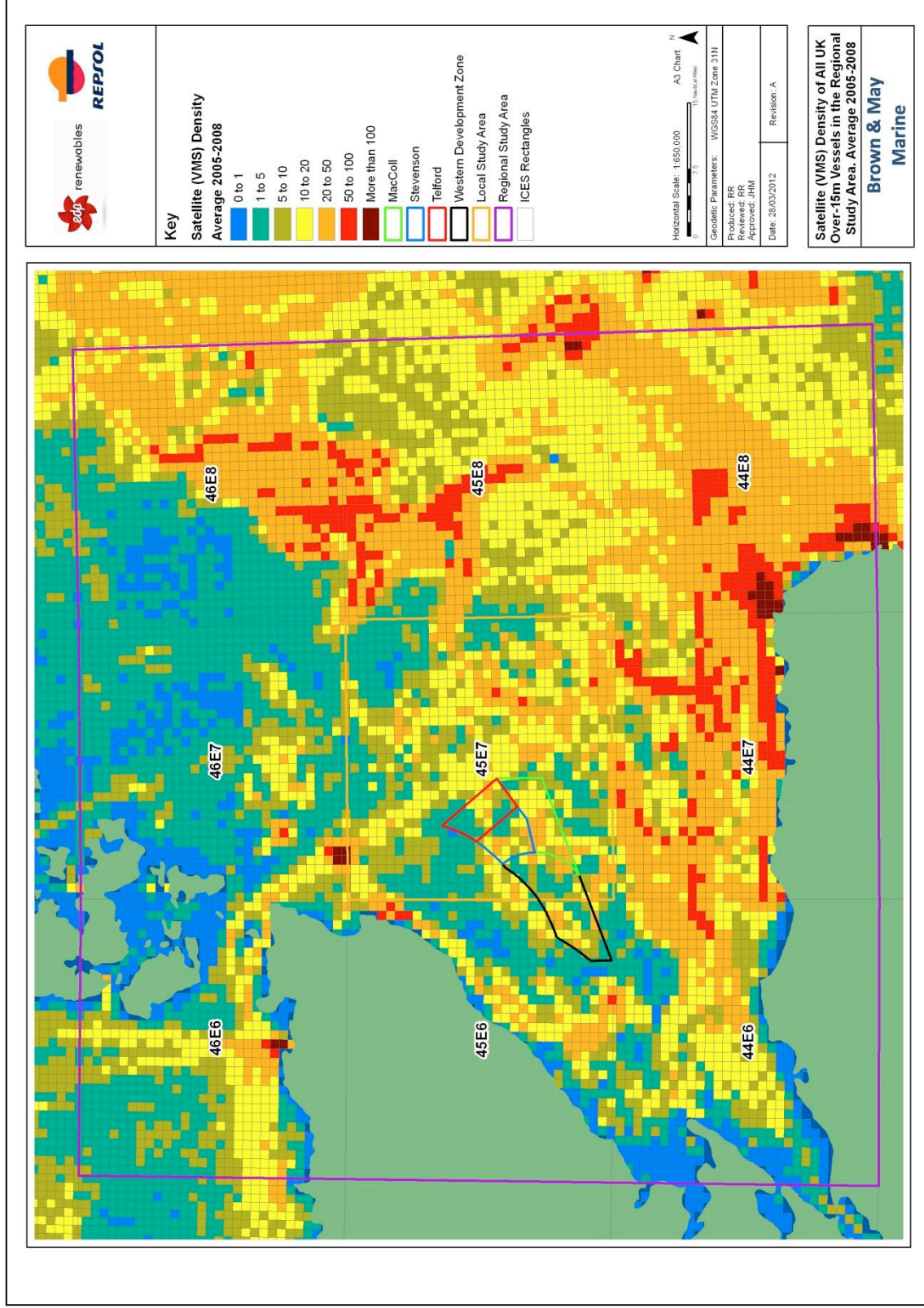


Figure 7.2 Satellite (VMS) Density of all UK Over-15 Metre Vessels (average 2005-2008) (Source: MMO)

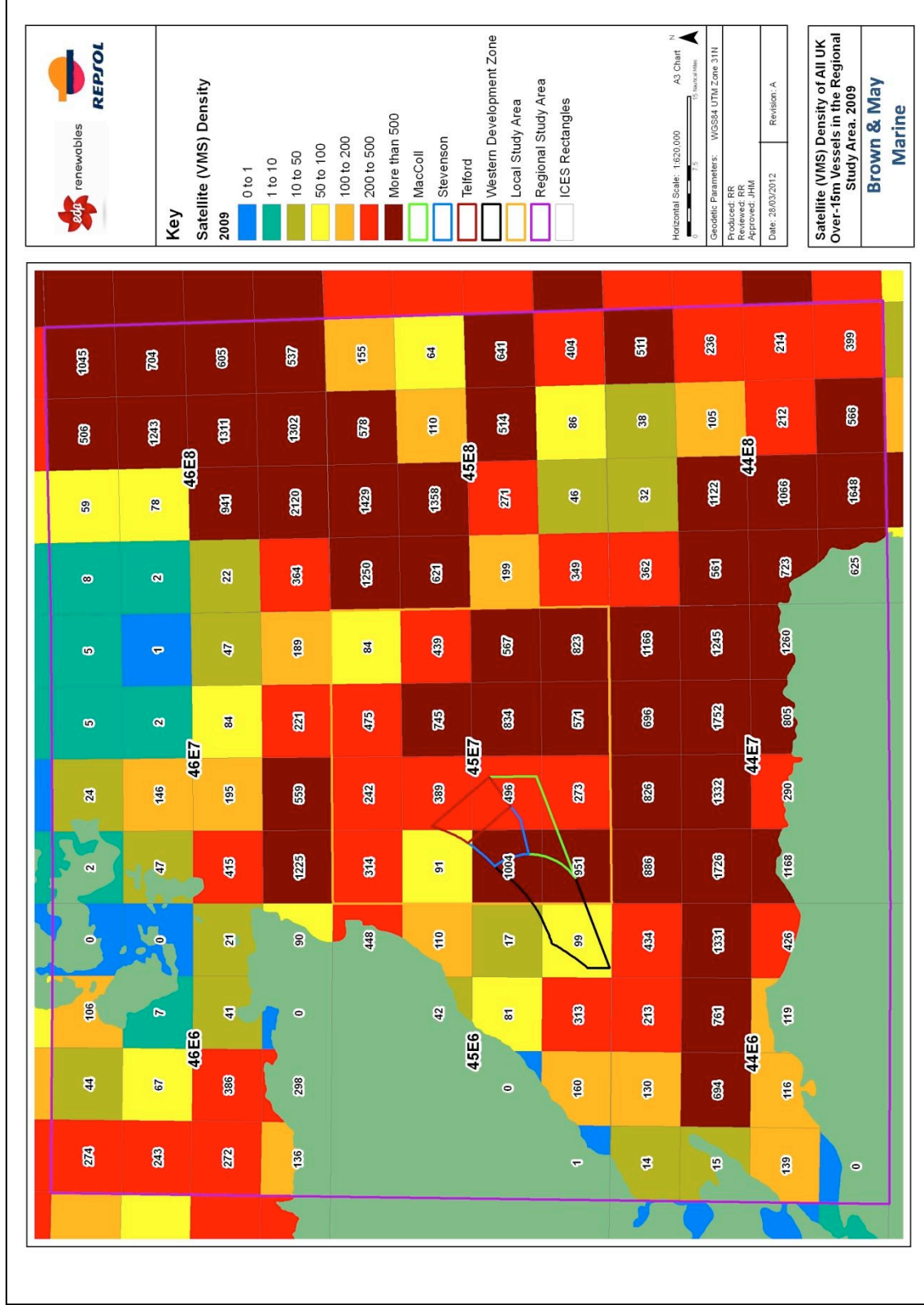


Figure 7.3 2009 Satellite (VMS) Density of all UK Over-15 Metre Vessels (2009) (Source: MMO)

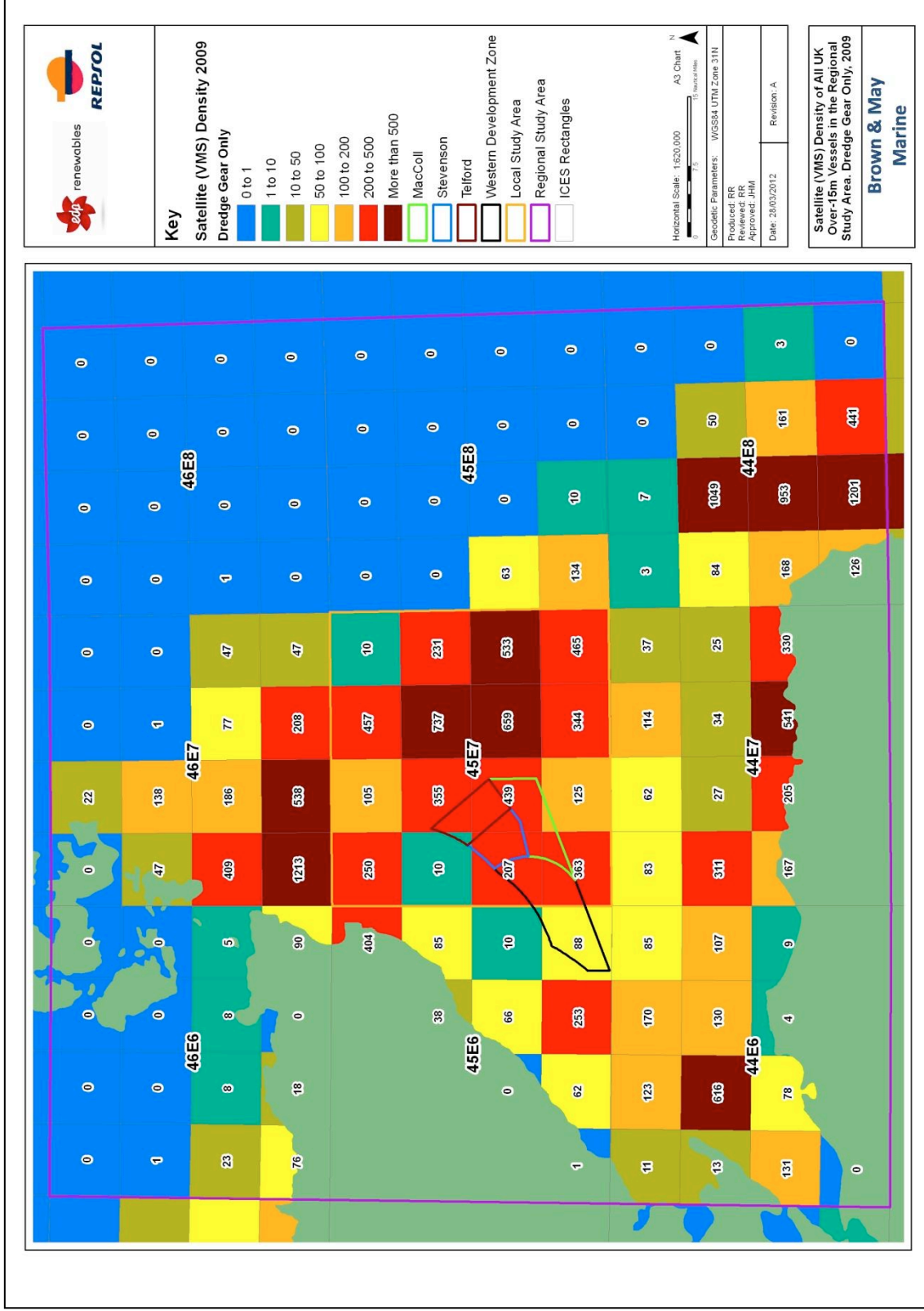


Figure 7.4 Satellite (VMS) Density of all UK Over-15 Metre Boat Dredge Vessels Only (2009) (Source: MMO)

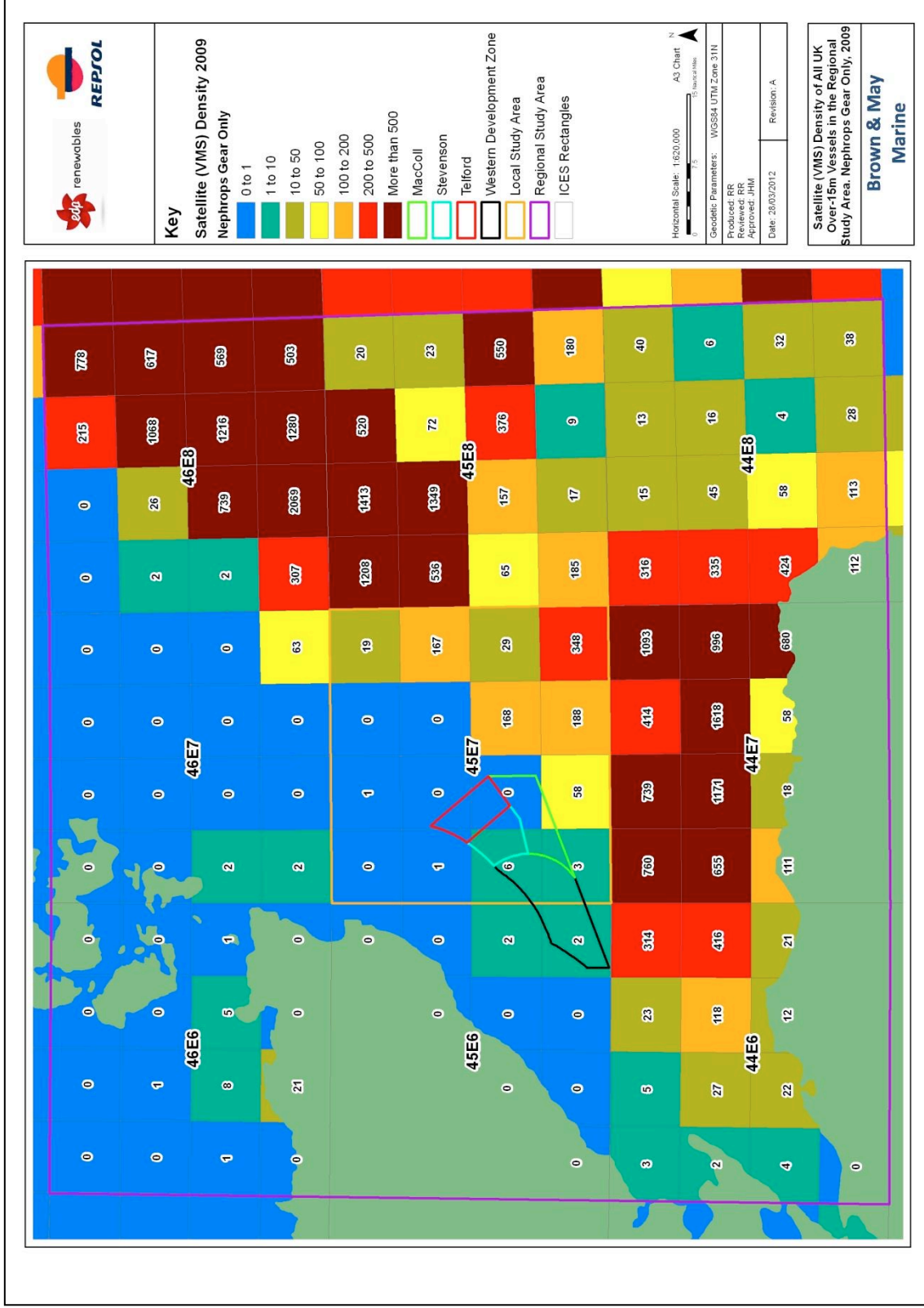


Figure 7.5 Satellite (VMS) Density of all UK Over-15 Metre Nephrops Trawl Vessels Only (2009) (Source: MMO)

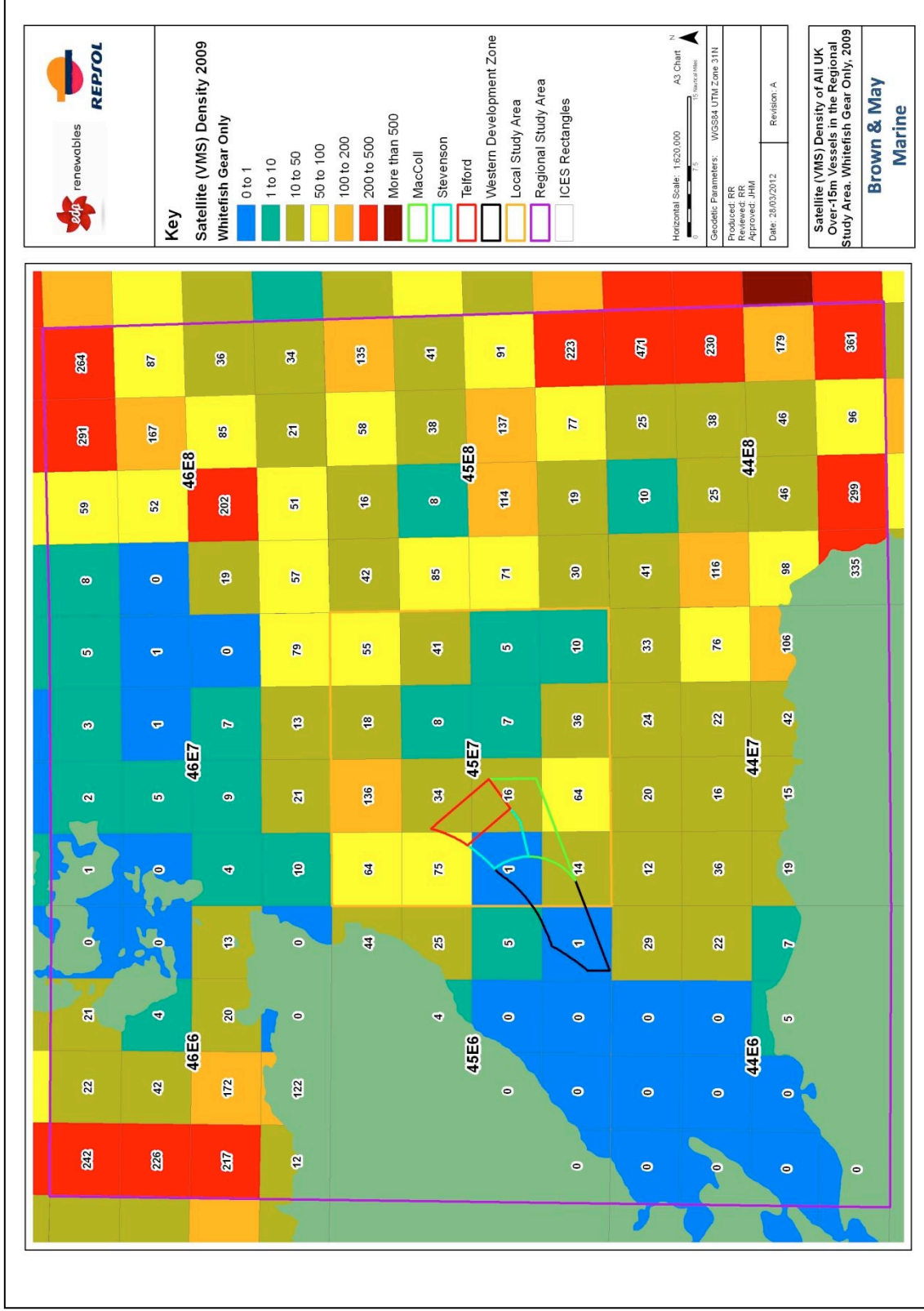


Figure 7.6 Satellite (VMS) Density of all UK Over-15 Metre Whitefish Gear Vessels Only (2009) (Source: MMO)

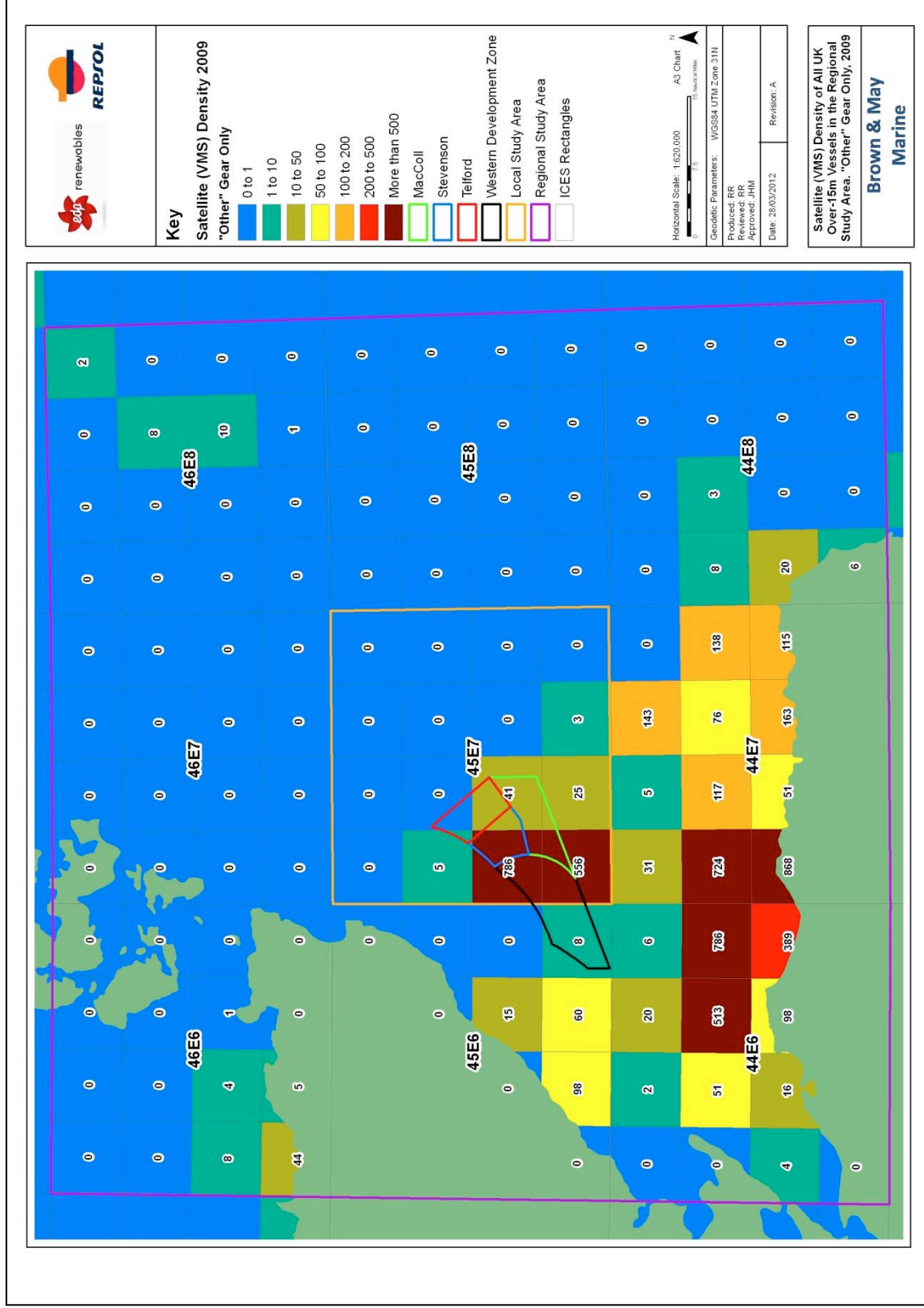


Figure 7.7 Satellite (VMS) Density of all UK Over-15 Metre "Other" Gear (2009) (Source: MMO)

8.0 MMO Fisheries Surveillance Sightings Data

Figure 8.1 and Figure 8.2 below give the positions of vessels identified by fisheries surveillance officers in the regional study area, by method and nationality, respectively. Vessels of all lengths are recorded. The sightings broadly corroborate with the analysis of the MMO data sets and satellite (VMS) densities: sightings are concentrated in the south and east of the regional study area; sightings are low to moderate in the local study area and within the MORL Eastern Development boundary.

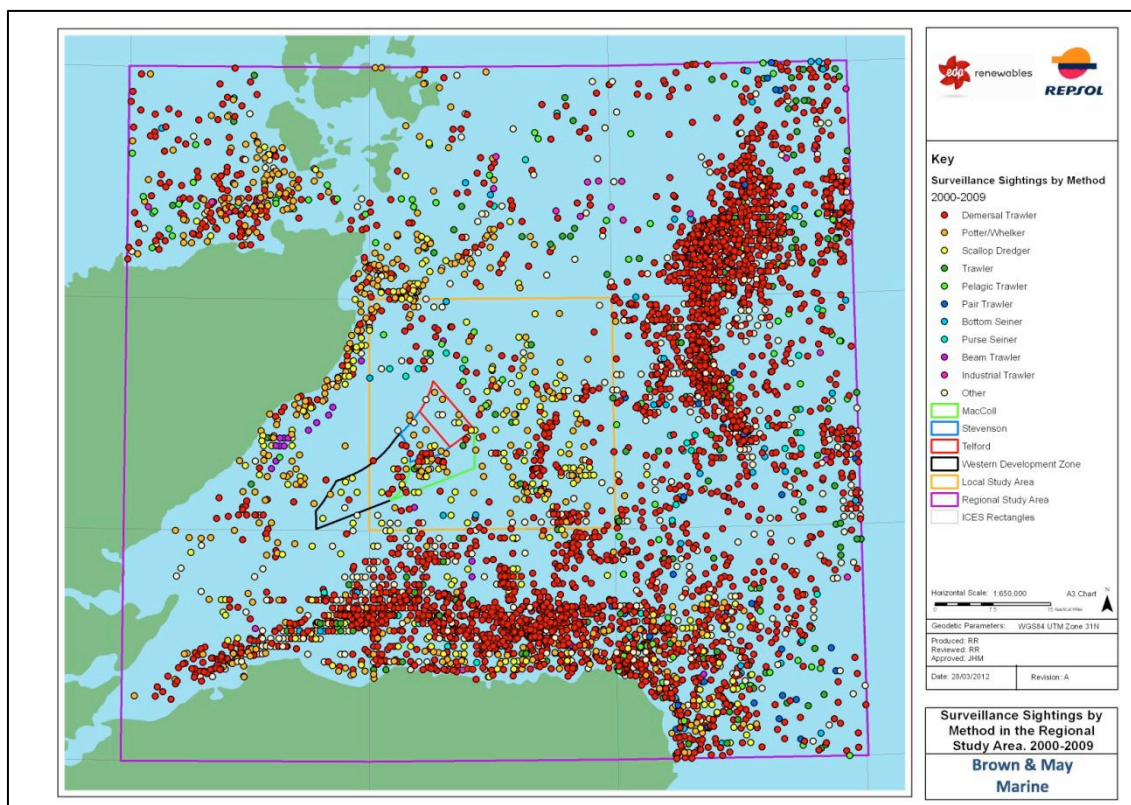


Figure 8.1 Surveillance Sightings by Method in the Regional Study Area (Source: MMO)

The majority of the vessels sighted within the regional study area are demersal trawlers and a high percentage of sightings were of UK registered vessels (98%). There is negligible foreign vessel activity which the statistical landings and effort data, and anecdotal evidence supports.

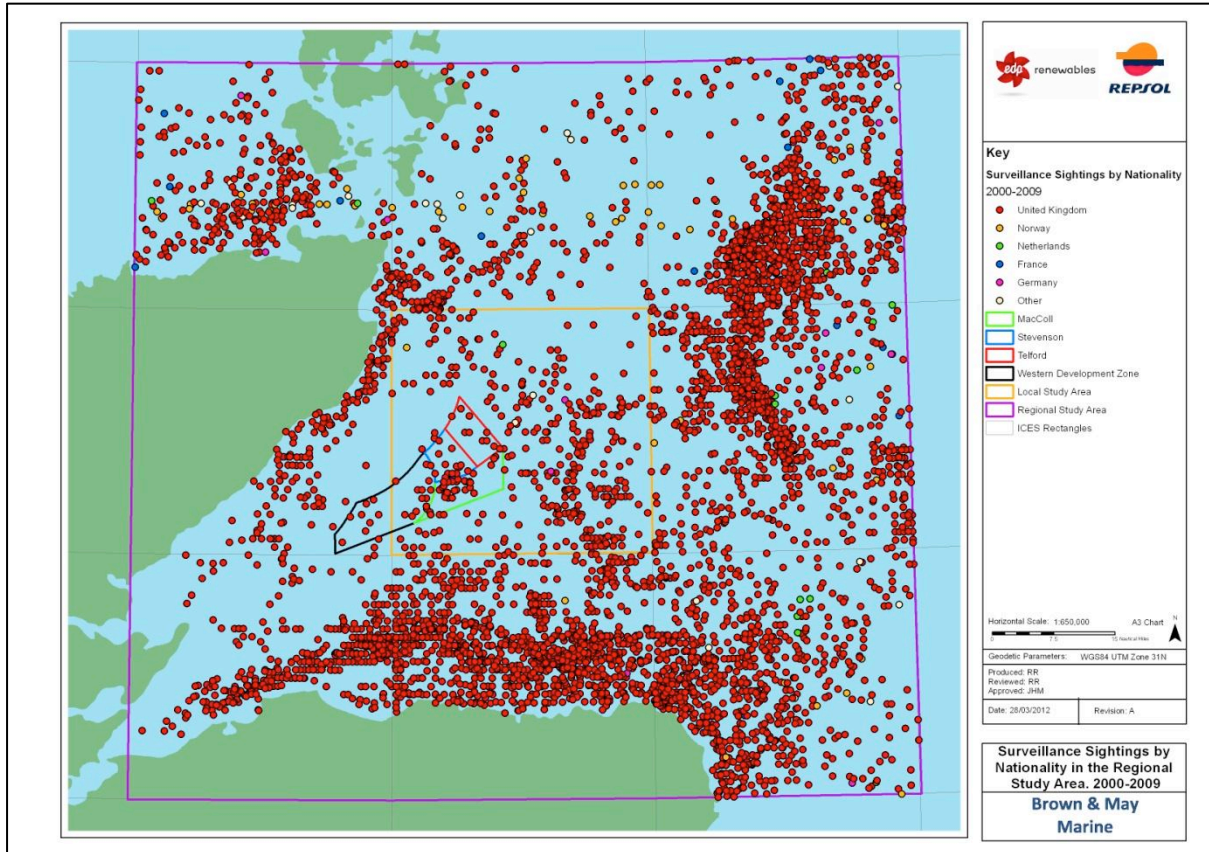


Figure 8.2 Surveillance Sightings by Nationality in the Regional Study Area (Source: MMO)

9.0 Marine Scotland Data Analysis

As mentioned in Section 4.9 previously, the following charts have been derived by Marine Scotland Science and provided to BMM to assist in the establishment of a commercial fisheries baseline in the Moray Firth area.

Figure 9.1 to Figure 9.3 illustrate the distribution of fishing gears in the Moray Firth for over-15 metre UK vessels between 2007 and 2009, respectively. In respect to the use of bottom otter trawls, the mesh size is indicative of the species targeted. Vessels employing mesh sizes of less than 100mm will be targeting *Nephrops* or squid, while those using mesh sizes greater than 100mm will be targeting demersal finfish such as haddock. It can generally be seen that demersal trawlers targeting finfish species are concentrated immediately to the north of the MORL Eastern Development and in areas in the south of the Moray Firth. Demersal trawlers targeting squid and *Nephrops* are predominantly in the south of the Moray Firth and, during 2009, in the southern part of the MORL Eastern Development. Boat dredges are recorded throughout the site and the Moray Firth area, including inshore areas. Gill nets and creels are used to the northwest of the regional area and along the southern coast of the Moray Firth.

Figure 9.4 to Figure 9.6 show the commercial landings densities of finfish in the Moray Firth for over-15 metre UK vessels between 2007 and 2009, respectively. It can be seen that demersal finfish are primarily caught and that landings of both demersal and pelagic finfish fluctuate over the three year period. 2007 and 2008 saw low landings of demersal finfish, but no landings of pelagic finfish within the MORL Eastern Development, while 2009 saw low landings of demersal finfish and low to moderate landings of pelagic finfish.

Figure 9.7 shows the commercial landings density of demersal species in 2009. Patterns are broadly commensurate for landings shown in Figure 9.4 to Figure 9.6, and the principal species are cod and haddock, generally recorded in the same area as a result of it being a mixed fishery. It should be noted that there is a higher density of haddock and to a lesser extent cod landings to the north of the Eastern Development.

Figure 9.8 to Figure 9.10 demonstrate the commercial landings densities of shellfish in the Moray Firth for over-15 metre UK vessels between 2007 and 2009, respectively. There are low landings of edible crab throughout the Moray Firth although it is considered that the majority of the creel fleet are under-15 metres in length and hence not included within this data set. Scallop landings correspond to those described for boat dredges with high levels of scallops landed from the MORL Eastern Development. *Nephrops* are targeted in the south and to the east of the Moray Firth. It can be seen that *Nephrops* and scallop fishing grounds are clearly defined as a result of the different substrates that the two species inhabit, which is discussed further in Section 10.0.

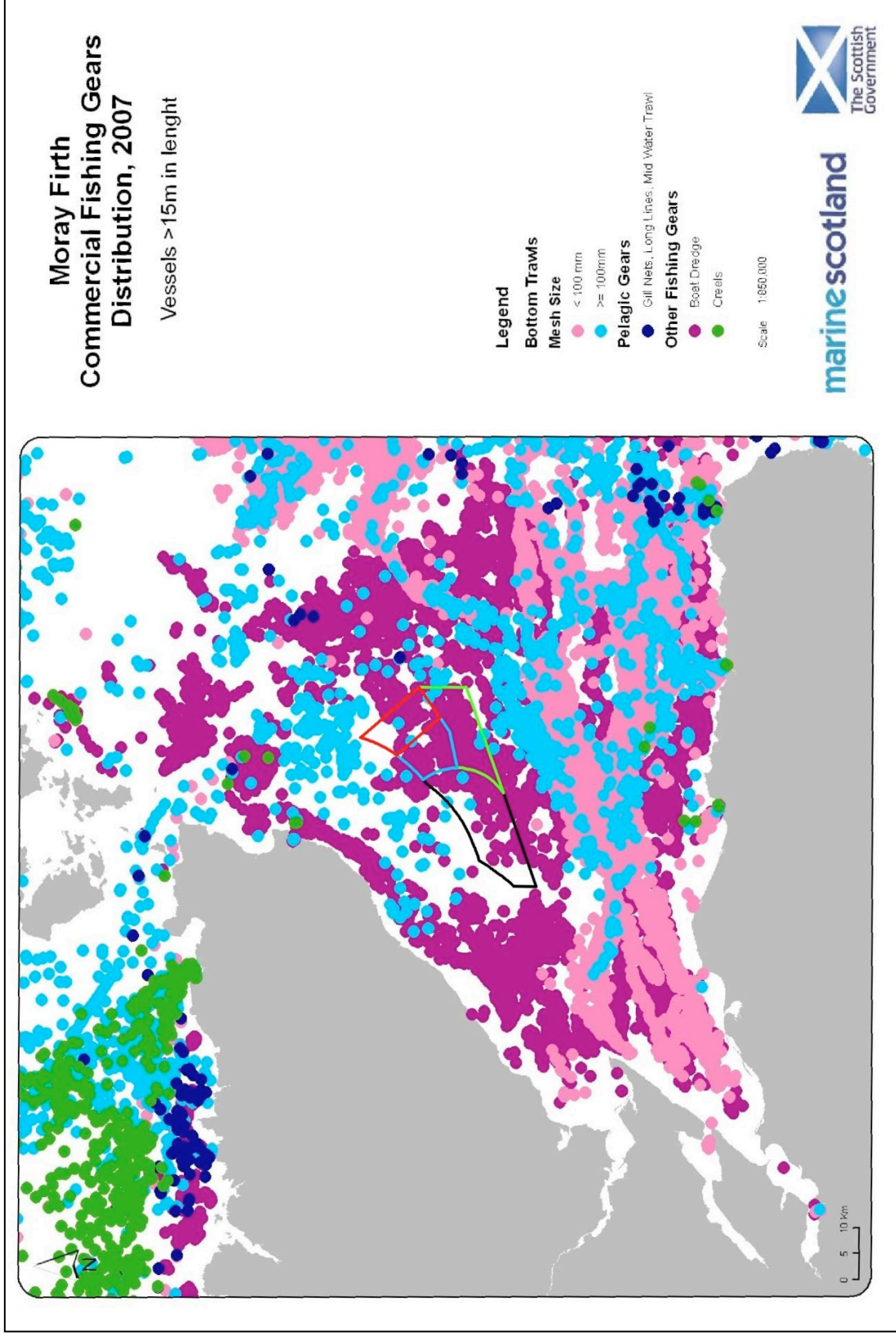


Figure 9.1 Fishing Gear Distribution for Over-15 Metre Vessels in the Moray Firth, 2007 (Source: Marine Scotland)

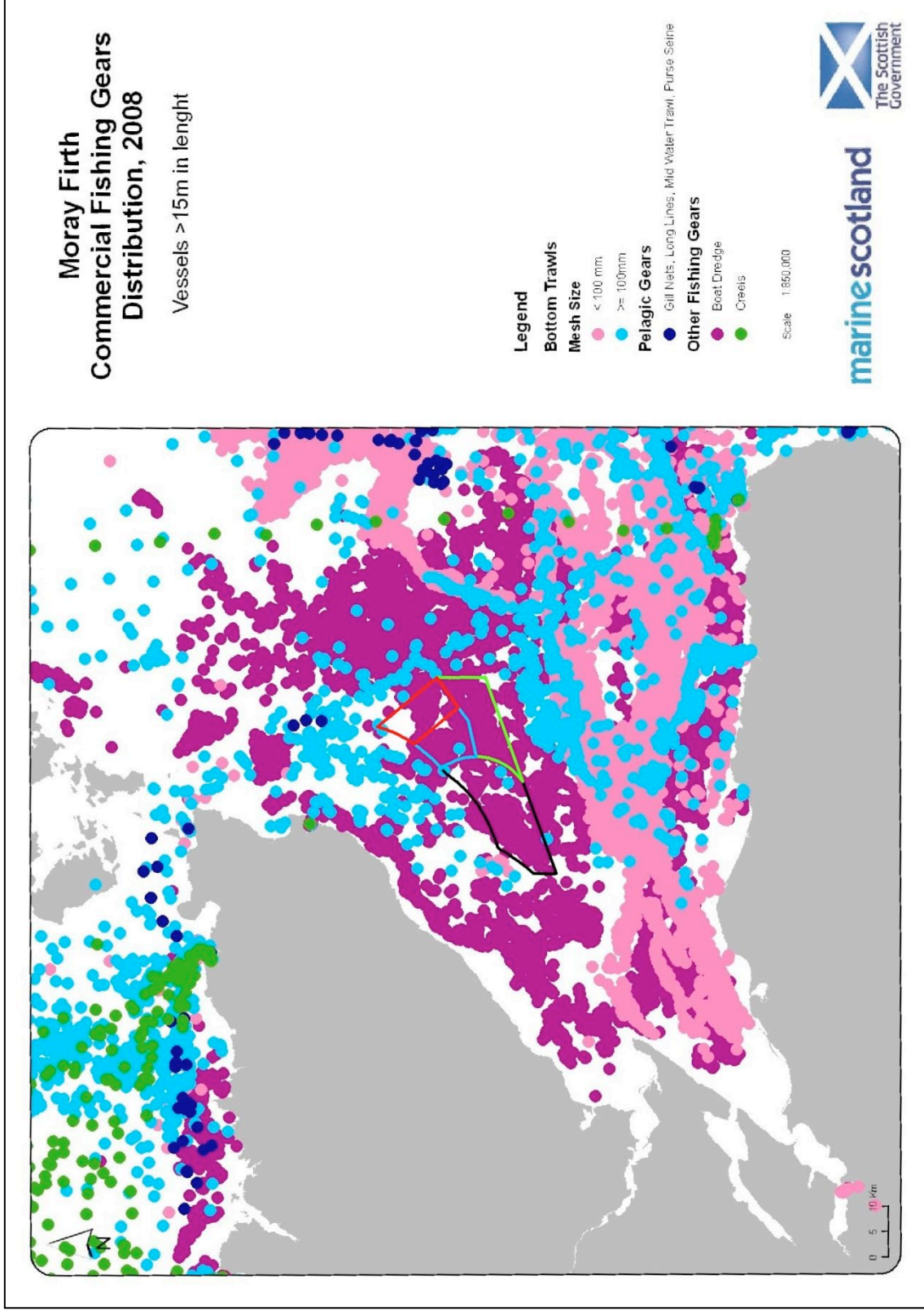


Figure 9.2 Fishing Gear Distribution for Over-15 Metre Vessels in the Moray Firth, 2008 (Source: Marine Scotland)

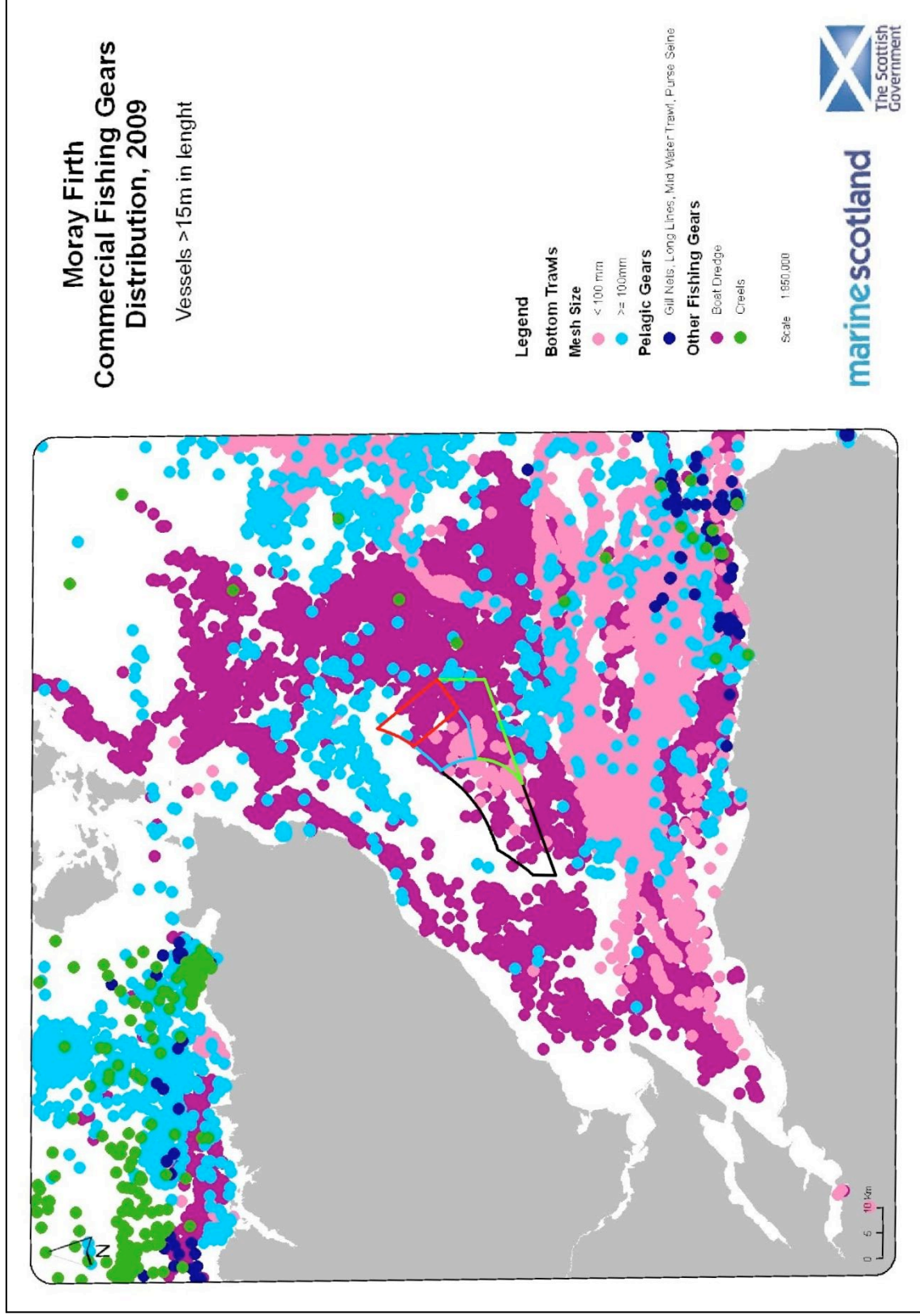


Figure 9.3 Fishing Gear Distribution for Over-15 Metre Vessels in the Moray Firth, 2009 (Source: Marine Scotland)

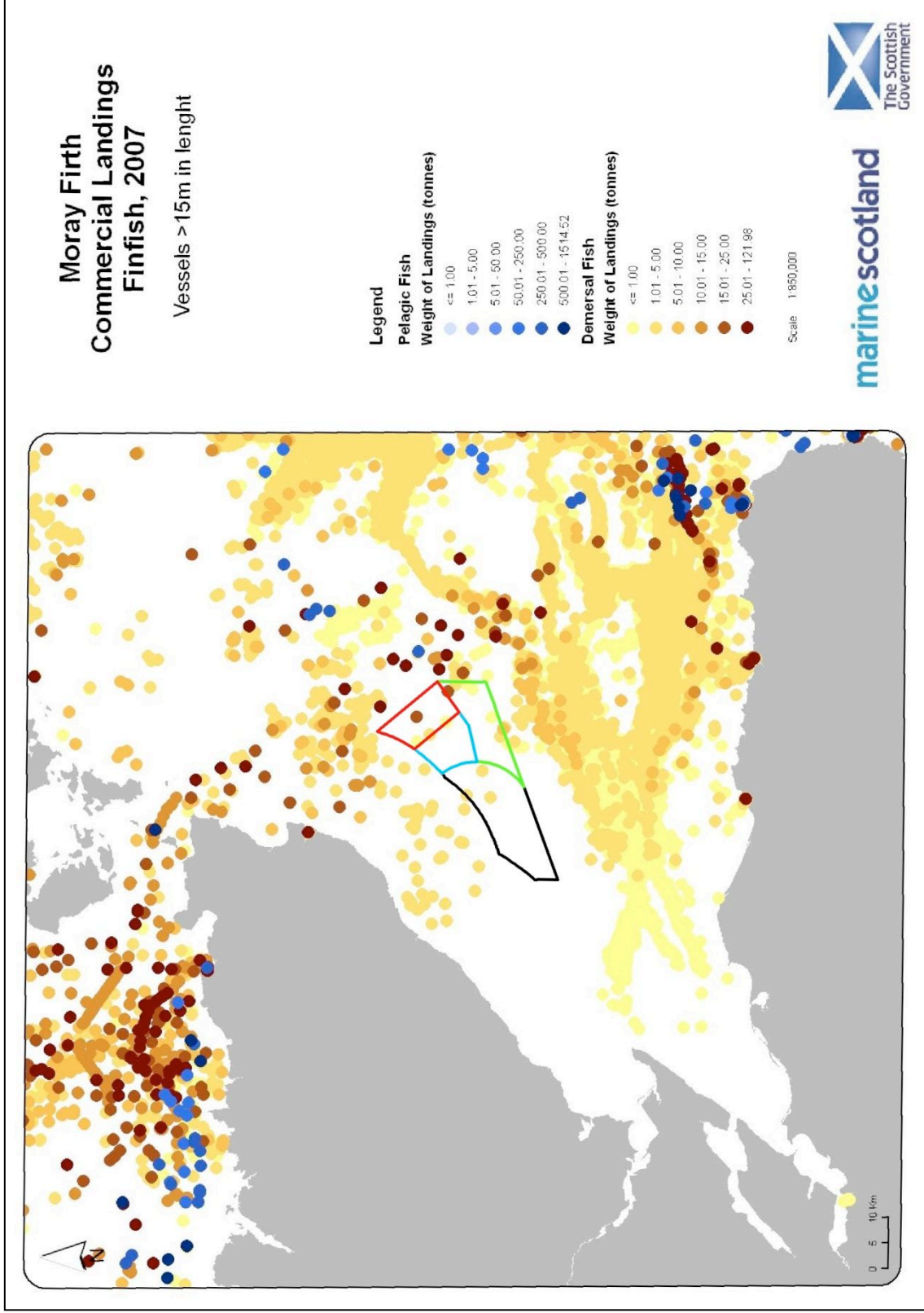


Figure 9.4 Commercial Landings of Finfish (Demersal and Pelagic) for Over-15 Metre Vessels in the Moray Firth, 2007 (Source: Marine Scotland)

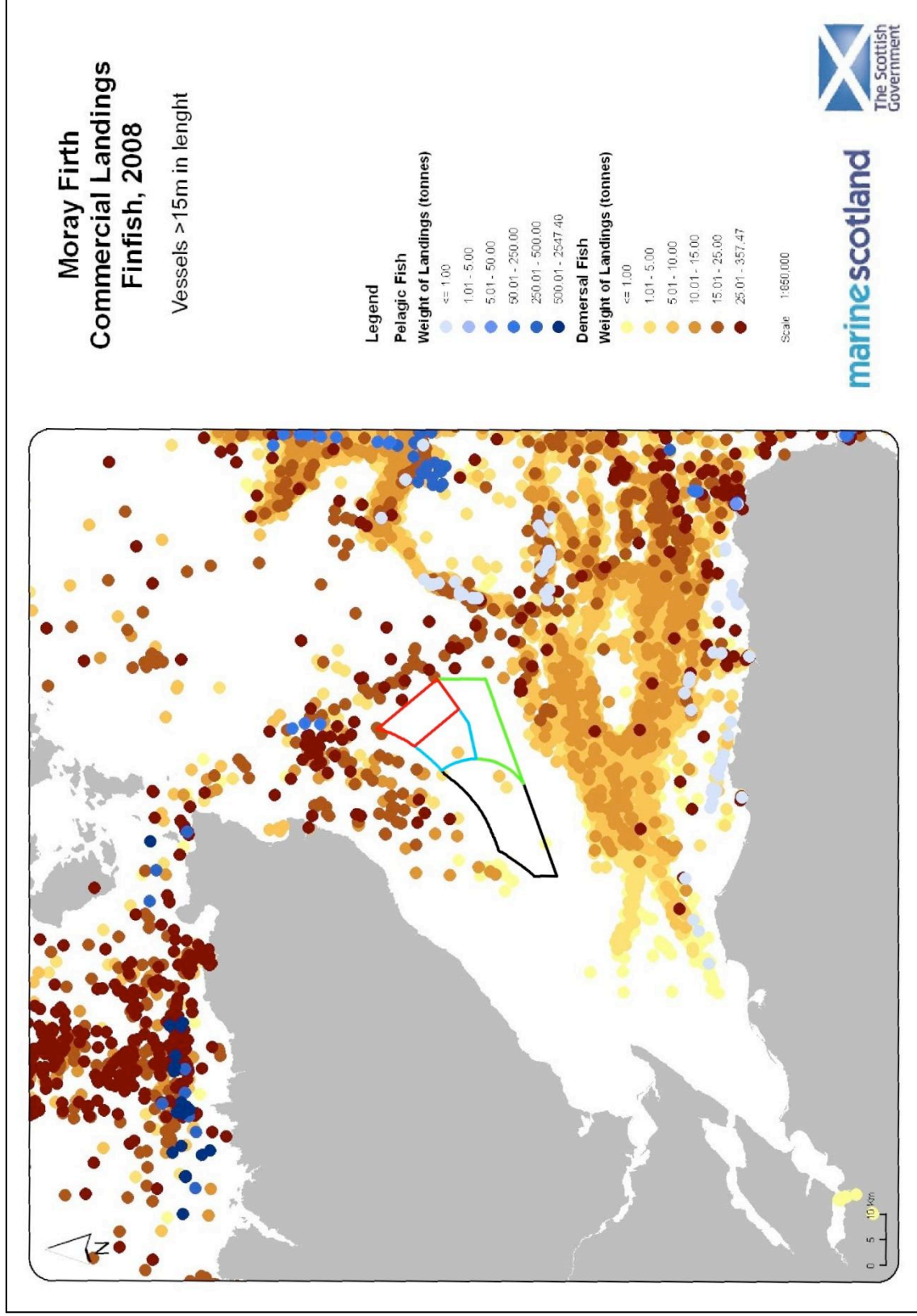


Figure 9.5 Commercial Landings of Finfish (Demersal and Pelagic) for Over-15 Metre Vessels in the Moray Firth, 2008 (Source: Marine Scotland)

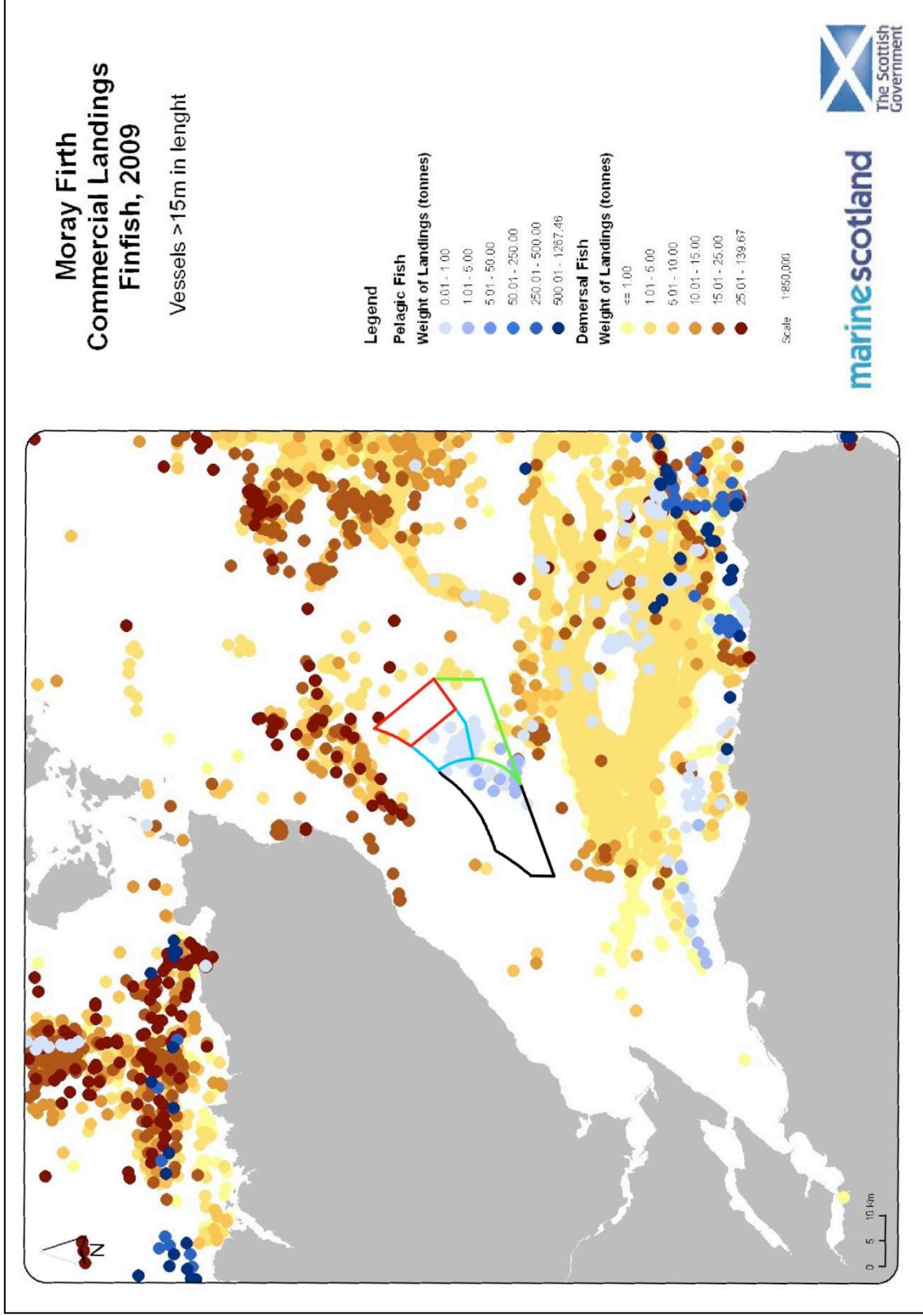


Figure 9.6 Commercial Landings of Finfish (Demersal and Pelagic) for Over-15 Metre Vessels in the Moray Firth, 2009 (Source: Marine Scotland)

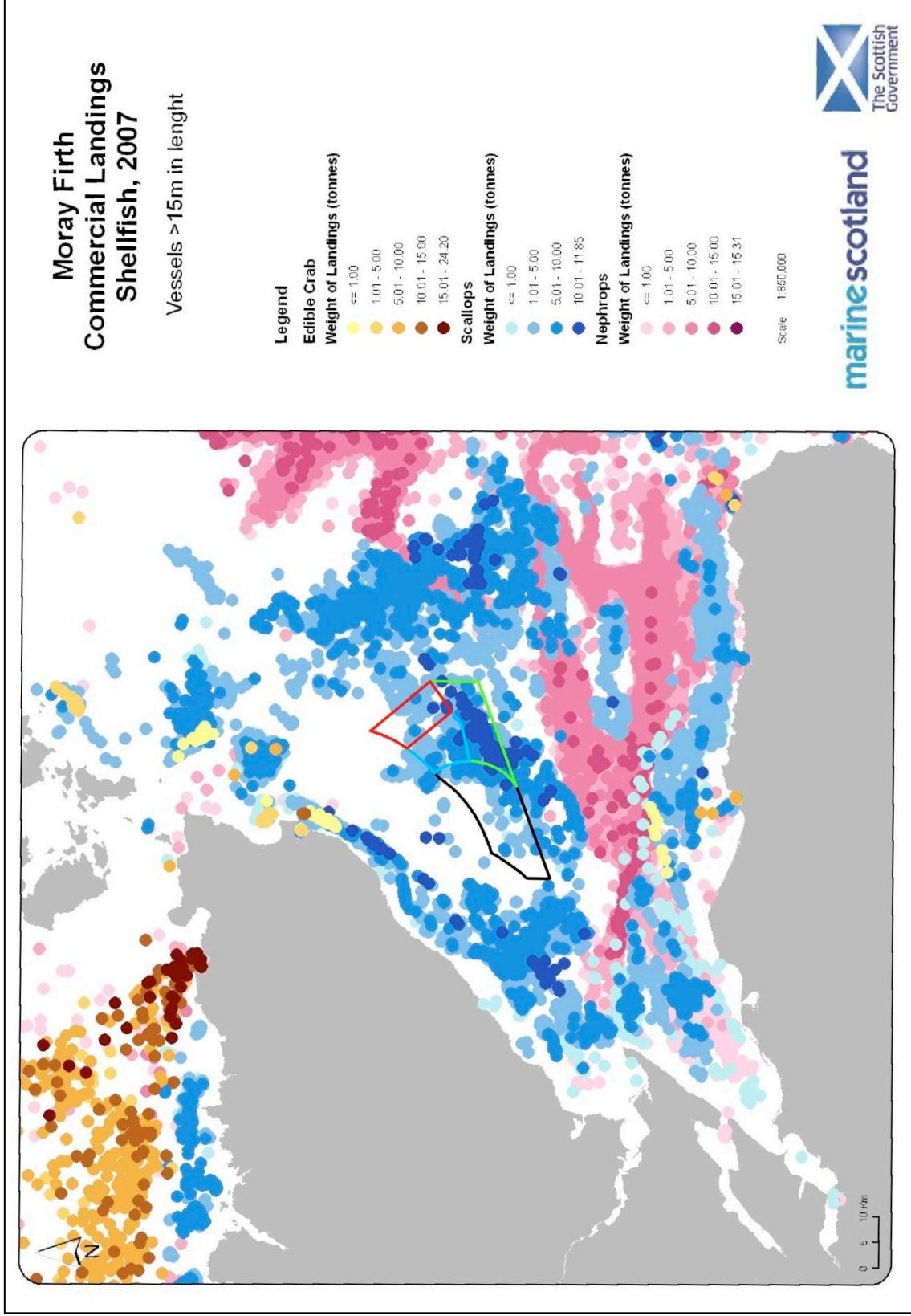


Figure 9.8 Commercial Landings of Shellfish (Edible Crab, Scallops and Nephrops) for Over-15 Metre Vessels in the Moray Firth, 2007 (Source: Marine Scotland)

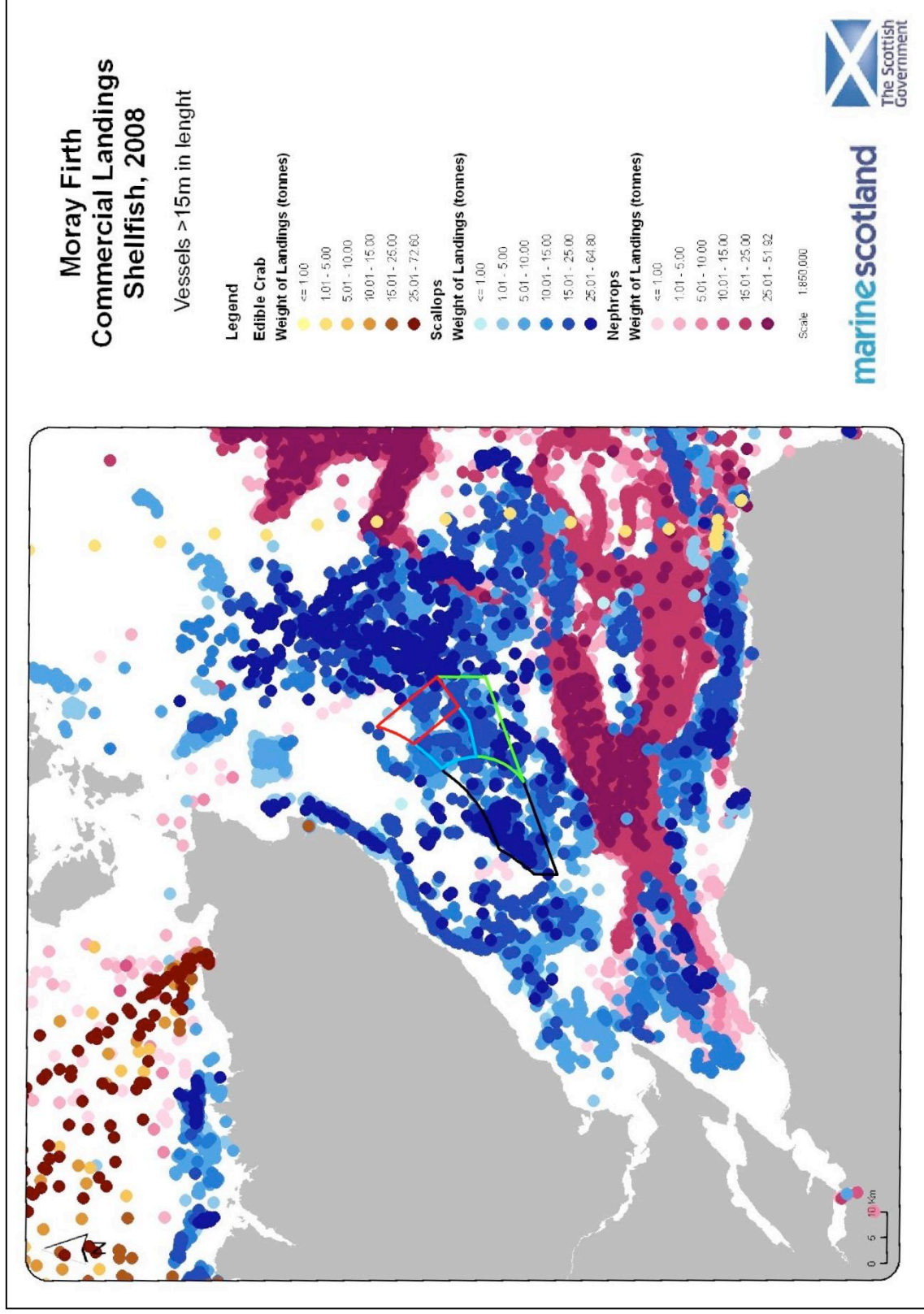


Figure 9.9 Commercial Landings of Shellfish (Edible Crab, Scallops and Nephrops) for Over-15 Metre Vessels in the Moray Firth, 2008 (Source: Marine Scotland)

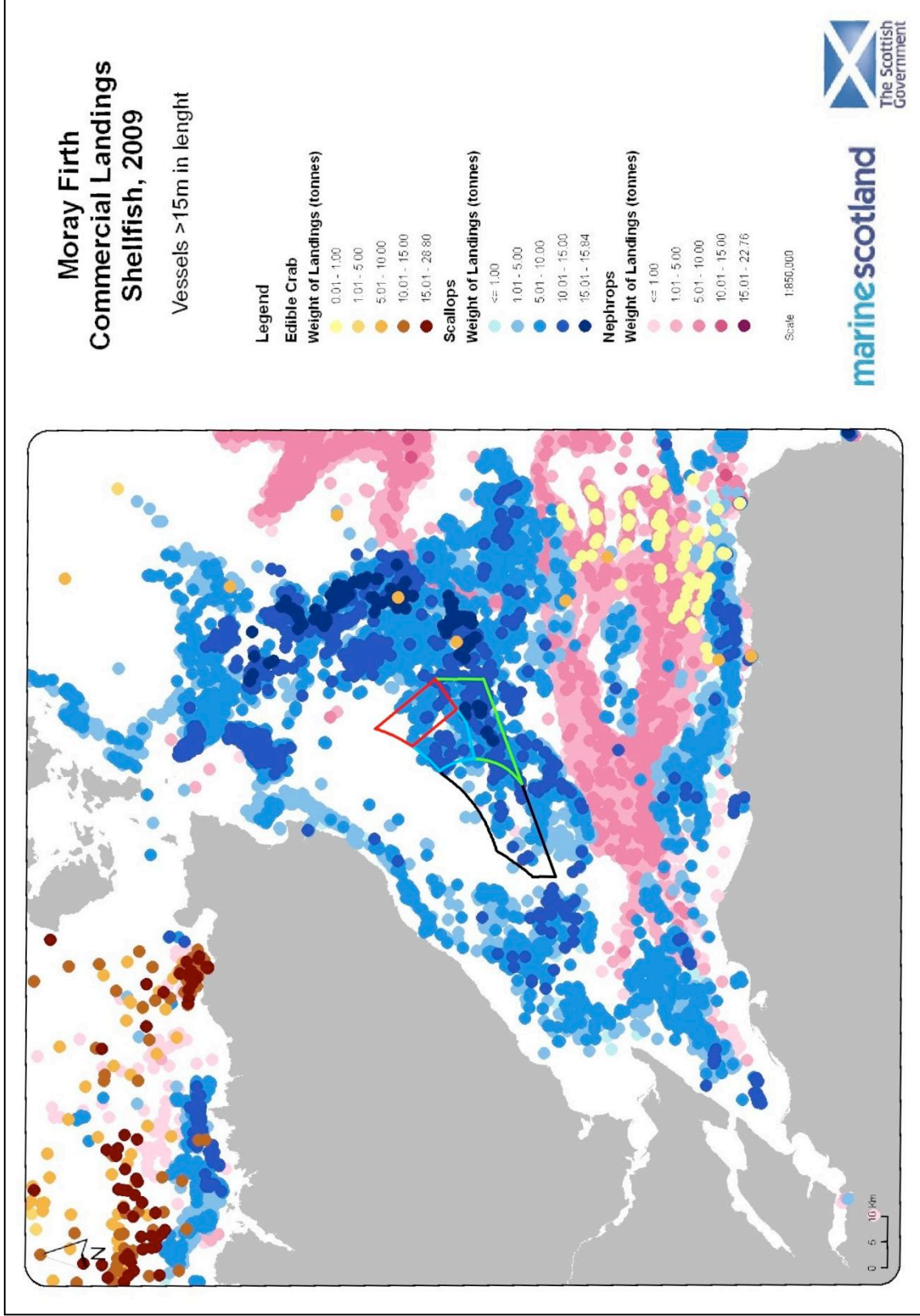


Figure 9.10 Commercial Landings of Shellfish (Edible Crab, Scallops and Nephrops) for Over-15 Metre Vessels in the Moray Firth, 2009 (Source: Marine Scotland)

10.0 Fishing Methods, Operating Patterns and Current Practices

The principal fishing activities undertaken in the vicinity of the proposed MORL Eastern Development are:

- Boat dredging for scallops
- Demersal otter trawling for *Nephrops*, whitefish and squid
- Scottish seine netting for whitefish
- Potting (creeling)

Fishing patterns and practices relevant to these activities are also described. Information gathered through consultation with fisheries stakeholders and provided by skippers active in the study area has informed the assessment.

10.1 Scallop Dredging

10.1.1 Fishing Gear

Scallop vessels operate by towing between one and two beams onto which a number of dredges are attached. The number of dredges used depends on vessel size, engine power, winch capacity and distance travelled out to sea. In English waters, the number of dredges can vary from three to four on a small, 10 metre boat and up to 18 to 20 on a 30 metre vessel with 1500hp. In Scottish waters, vessels are limited to 14 dredges outside 12nm.

The most common dredge type used in UK waters is the Newhaven scallop dredge. Scallops are 'raked' from their recessed position in the seabed by 8 or 9 steel teeth that are up to 11cm long and are attached along the leading edge of the dredges and which penetrate the seabed. The maximum possible penetration depth of this gear is 20cm, but this will vary depending on substrate composition. Behind the teeth are mesh bags which are designed to retain the catch⁴. Figure 10.1 below shows the basic configuration of scallop fishing gear. The gear dimensions of an average scallop dredge vessel, Vessel A, can be seen in Table 10.1 below.

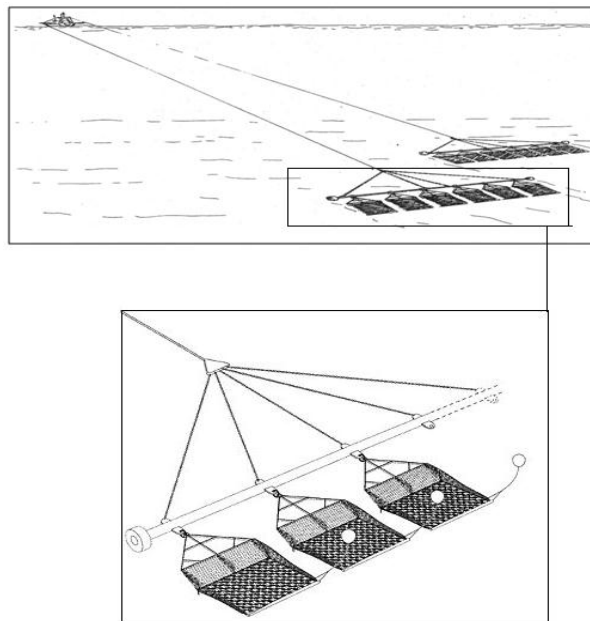


Figure 10.1 Scallop Dredging (created by BMM)

⁴ Beukers-Stewart, B.D. and Beukers-Stewart, J.S. (2008) Principles for the Management of Inshore Scallop Fisheries around the United Kingdom. *Environmental Department, University of York report to CCW/SNH/NE*

Table 10.1 Gear Dimensions of Vessel A, a Scallop Dredge Vessel

Fishing vessel	Vessel A
Home port	Buckie
Length	30.2m
Drive type	Electric
Number of trawl winch drums	4
Length of warp on each drum	500m
Braking type	Band
Wire type	6x26+1
Warp diameter	32mm
Warp minimum breaking strain	60t
Length of warp paid out relative to depth	2.5:1
Number of beams	2
Beam length	16m
Beam weight	2.5t
Wheel diameter	480mm
Number of dredges per side	15
Dredger length	0.81m
Dredge weight	0.25t
Estimated total gear width	16.5m

10.1.2 Fishing Patterns and Practices

The Moray Firth scallop fishery developed in the mid 1970s. The fishery increased rapidly from 1980 and became the largest scallop fishery in Scotland in 1992. Landings increased from 1992 until 1996 where they reached 3490 tonnes, and then declined rapidly before levelling off between 1998 and 2001. There was a sudden decline in landings in 2002, reaching a low point of 742 tonnes, although this had recovered by 2003 to 1800 tonnes. Anecdotal evidence suggested that it was as a result of a number of larger vessels spending time fishing in the English Channel⁵. From 2004 onwards, scallop landings have fluctuated with a historically low catch in 2007, but an increase in landings in 2008⁶. Scallops prefer sediments comprised of sand, gravel and mud, sometimes with stones, rocks or boulders⁷ and are found below the low water mark to depths exceeding 100m.

The scallop fleet is the most active during the middle two quarters of the year, although scallop fishing occurs all year round. High proportions of the scallop grounds in the north east are beyond the 12nm limit and therefore attract larger vessels which are able to use up to 14 dredges attached to a beam on either side of the vessel.

The majority of the scallop dredging fleet is nomadic and fish around the UK coast; the areas fished depend on the productivity of each scallop ground and the changes in stock levels and regulations. It is understood that the majority of scallop grounds are fished periodically and then left until it is thought that stocks have sufficiently recovered. Smaller vessels are based locally, landing their catch on a daily basis, employing fewer dredges and dominating the inshore sector. Larger vessels target grounds offshore, this allows them to operate higher numbers of dredges and participate in trips that last for four or five days.

Within the Moray Firth, there are several locally based vessels that concentrate the majority of their activities within the local area. In addition there are visiting vessels from the east and west coasts of Scotland that periodically fish the Moray Firth scallop grounds as well as other grounds around the UK. Generally, the majority of scallop dredging activity in the Moray Firth takes place between March and June, although activity occurs throughout the year (Figure 6.12). Over the past ten years,

⁶ Keitz, S. and Bailey, N. (2010) Fish and Shellfish Stocks 2010. *Marine Scotland Report*

⁷ Keitz, S. and Bailey, N. (2010) Fish and Shellfish Stocks 2010. *Marine Scotland Report*

landings of scallops from the Moray Firth have been irregular. The scallop fleet heavily targeted the Moray Firth scallop grounds in summer 2008; however since then the area has seen low scallop landings; however, the fishery is considered to be cyclical and grounds are heavily targeted for a period and then left to recover (pers. comm. scallop fisherman, December 2010).

As has been previously stated, the scallop fishery is managed through minimum landing sizes (100mm shell width), restrictions on dredge numbers and seasonal closures. There are currently no limits in the form of catch or effort quotas. It should be noted however that alternative management schemes have the effect of restricting scallop dredging activity. For example, the closure of important scallop grounds in Cardigan Bay due to conservation measures has displaced activity and increased pressure in other areas. In addition to this, restrictions have also been imposed upon the scallop fleet in waters around the Isle of Man. These restrictions were deemed necessary to prevent a repeat of the intensive levels of fishing activity as seen during the 2008 and 2009 seasons, which resulted in significant damage to the Isle of Man scallop stocks and fishing grounds. The closure excludes all vessels over 300hp that have not fished in the area for at least 50 days over the past 18 months and impacts upon many Scottish vessels who seasonally dredge the area. This closure has added further pressure upon remaining grounds and, as a result of this, the Scottish Government has extended the seasonal closure of Luce Bay, to the north of the Isle of Man, over fears of the environmental impact of the displaced vessels⁸.

10.2 Demersal Otter Trawling for *Nephrops*, Whitefish or Squid

In terms of vessel numbers, demersal otter trawling is currently the most common commercial fishing method in Scottish waters. Figure 10.2 below gives the basic configuration of a single rig demersal otter trawler. The otter boards maintain the horizontal opening of the net; they are relatively heavy and a steel toe can be added to ensure good contact with the seabed. Seabed penetration of the otter board varies with the type of otter board used, towing speed and seabed composition. Studies have shown that penetration depths can vary between 50mm on sandy bottoms to 300mm on soft mud⁹. Generally, the warp to depth payout ratio is around 3:1. Fish are herded between the otter boards, along the sweeps and into the mouth of the trawl where they drift through the net to be retained in the cod end. Predominantly, demersal otter trawlers in the Moray Firth target *Nephrops*, whitefish and squid.

⁸ Ross, D. (2010) Scallop-dredging row leaves Scots boats nowhere to fish. *The Herald Scotland*, 18/11/10

⁹ Linnane, A., Ball, B., Munday, B., van Marlen, B., Bergman, M. and Fonteyne, R. (2000) A review of potential techniques to reduce the environmental impact of demersal trawls. *Irish Fisheries Investigations (New Series)*. No. 7

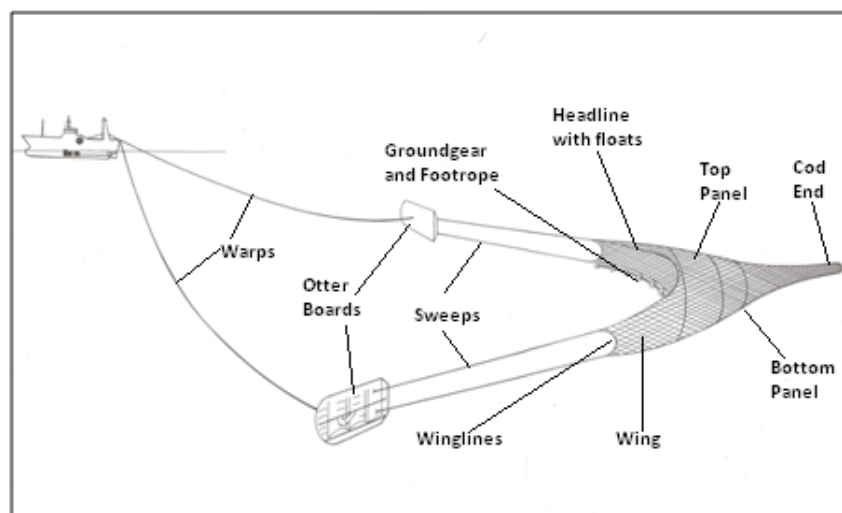


Figure 10.2 Single Net Demersal Otter Trawl (created by BMM)

Demersal otter trawl vessels can also operate two nets at the same time, known as twin-rigging. The two otter boards are used to maintain the lateral opening of the nets on the outer sweeps. A third warp is attached to a central clump weight separating the two nets in the middle. Twin rig vessels are often used to target *Nephrops*, but are also used in whitefish fisheries. Demersal pair trawling is also undertaken whereby two vessels tow a single net between them, with each vessel towing one warp. The gear dimensions of an average demersal trawler are given in Table 10.2 below. Vessel B uses both single and twin rig gear to target *Nephrops* and squid.

Table 10.2 Gear Dimensions of Vessel B, a Demersal Otter Trawler

Fishing vessel	Vessel B	
Home port	Macduff	
Length	13.9m	
Drive type	High Pressure Hydraulic	
Number of trawl winch drums	3	
Length of warp on each drum	366m	
Braking type	Band	
Wire type	6x19 steel core	
Warp diameter	16mm	
Warp minimum breaking strain	19.5t	
Length of warp paid out relative to depth	3:1	
	Demersal Trawl	Twin Rig
Trawl door length	2m	1.5m
Trawl door height	2m	1.5m
Trawl door weight	0.36t	0.24t
Distance between doors under normal towing conditions	38m	11m
Number of bridles per side	2	2 per net
Bridle length	36.5m	70m
Ground line length	33.5m	30m
Disc diameter of rockhoppers	355mm and 400mm	N/A
Net type	Squid Rockhopper	Two Demersal <i>Nephrops</i> Trawls
Mesh size	40 to 200mm	80 to 200mm
Estimated headline height	3.6m	2.4m
Estimated distance between net wing ends	11m	12.2m

10.2.1 Whitefish Fishery

The whitefish fishery in the Moray Firth is, for the most part, a mixed fishery with other species being caught in addition to the target species. As elsewhere in the North Sea, whitefish landings in the Moray Firth have declined over the past 10 years. Cod stocks began to decline in the 1980s and this resulted in a series of quota reductions which restricted the fishermen's ability to legally land cod. These cuts in quota have encouraged the discarding of fish at sea, considered by all within the industry to be one of the biggest failures of the management policy.

The current whitefish fleet has a number of restrictions to which they must adhere. These restrictions are used to regulate the fishery and are highly complex, but essentially control landings levels of individual species through catch and effort quota allocations, gear restrictions and by-catch control.

Due to the increasing restrictions on their target species, a number of whitefish vessels have since diversified and are now targeting *Nephrops* and scallops, the quota levels of which are not so restrictive. The majority of the Scottish whitefish fleet that are continuing to target whitefish species now travel to grounds further offshore. In recent years, there has been reported to be a discrete haddock fishery in the north of the Moray Firth (pers. comm. Buckie Fishery Office, November 2010), which is corroborated by analysis of fisheries statistical data sets previously.

10.2.2 *Nephrops* Fishery

Nephrops gear is configured similarly to that used to target whitefish (Figure 10.2). A smaller mesh is used, which is a minimum of 70mm in diameter. *Nephrops* vessels can employ either single or, more commonly, twin rig demersal gear, as described above. *Nephrops* inhabit burrows in the seabed and favour muddy and soft substrates. Fishing is year round, although there is a peak in activity in the summer months¹⁰.

Nephrops are targeted by vessels utilizing either single (one net) or twin rig (two nets) demersal trawl gear and are targeted by both the under and over-15 metre fleets. The under-15 metre fleet is generally comprised of local vessels which concentrate activity on grounds in proximity to their home ports. The over-15 metre fleet usually target grounds further offshore in the North Sea (pers. comm. retired whitefish fishermen, December 2010).

The Moray Firth *Nephrops* fishery began on a small scale in the 1960s. The fishery reached a peak in landings in the 1980s, but then declined until the 1990s. The Moray Firth *Nephrops* fishery is small relative to other *Nephrops* fisheries in Scotland although it is still one of the most important shellfish fisheries in the Firth¹¹.

The *Nephrops* fishery has become an important resource to whitefish fishermen who have seen increasing restrictions on declining whitefish stocks. In Scotland, there are currently considered to be too many vessels targeting *Nephrops* and increasing the pressure on the current stocks, which have seen a decline in landings in recent years¹². In the Moray Firth, however, underwater television (UWTV) surveys conducted by Marine Scotland revealed that the *Nephrops* population is relatively stable but that stock levels are at lower levels than recorded during 2003-2005. *Nephrops* size surveys also suggest that at present the mean size of individuals has remained relatively constant which may indicate that stocks are currently being exploited sustainably¹³.

¹⁰ Keltz, S. and Bailey, N. (2010) Fish and Shellfish Stocks 2010. *Marine Scotland, The Scottish Government*

¹¹ Moray Firth Partnership Fisheries Topic Group, 26 April 2006

¹² The Scottish Government (2010) The Future of Fisheries Management in Scotland; *Edinburgh 2010*

¹³ Keltz, S. and Bailey, N. (2010) Fish and Shellfish Stocks 2010. *Marine Scotland, The Scottish Government*

The VMS dataset and Marine Scotland charts discussed previously, in conjunction with anecdotal evidence and substrate identification, have shown that the MORL site is not located on substrates suitable for nephrops. It can be seen that the principal grounds are in the southern half of the Moray Firth and to the east.

10.2.3 Squid Fishery

Over the last 20 years, a squid fishery has been operating in the Moray Firth¹⁴. Demersal otter trawlers are able to target this fishery by reconfiguring gear. Nets are altered to those with a mesh size of 40mm and have higher headlines as the species is caught off the seabed, where it returns during the day after feeding closer to the surface at night. As squid are targeted on rocky or uneven ground (which is suitable for spawning) vessels often deploy rockhoppers; protective gear used to minimise damage to nets.

There has been a directed squid fishery in the Moray Firth since approximately 2004, although squid had been caught in the area previously, predominantly targeted by Scottish seiners on sandy substrates (pers. comm. retired whitefish fisherman; squid fisherman, December 2010). The fishery has become increasingly important to the demersal trawler fleet as an alternative to restricted stocks such as whitefish and *Nephrops*: presently, the squid fishery is unregulated, so there are no restrictions upon the activity (either in quota or effort). Both local and vessels from ports as distant as the west coast, the Orkneys and the Shetlands are diversifying into the fishery.

Squid have a short lifespan and therefore the fishery fluctuates from year to year depending on the survival success rates of individual breeding seasons. Section 6.1.3.1 previously, illustrates that 2009, and to a lesser extent 2005, were good years for squid fishing in the Moray Firth, with high landings values for the species. The squid fishery is usually of short duration, being dependent on the arrival of squid in the area. The peak is generally around August and September (Figure 6.15), although it has been reported to be lengthening in duration¹⁵.

Squid can be targeted on both rocky and sandy substrates, generally during daylight hours¹⁶, although the majority of squid is caught using rockhopper gear on shallow, rocky grounds (pers. comm. squid fisherman, December 2010). Squid grounds are not fixed and vessels are discovering more grounds where squid can be caught, therefore there is the potential for squid grounds to change in future years.

10.3 Scottish Seine Netting

Scottish seine netting is undertaken by a single vessel and involves surrounding demersal fish species by seine ropes laid out on the seabed with the net at mid length (Figure 10.3). As the ropes are hauled in (Figure 10.4), the fish are herded into the path of the net. Seine netting is used to target demersal species on a sandy substrate. The Moray Firth seine net vessels generally target demersal whitefish species, although they are able to target squid when the species is present on sandier substrates. The dimensions of a Scottish seine netter, Vessel C, are given in Table 10.3 below.

Historically, seine net vessels were equipped with much lower power engines than their trawler counterparts, making them much quieter when fishing. Due to the changes in the fishing industry and increasing restrictions, new seine net vessels are generally built as multi-purpose seine netters/trawlers, allowing them to target species on both sandy and rocky substrates, thus

¹⁴ Campbell, R. and McKay, A. (2007) The Moray Firth Squid Fishery 2006. *Fisheries Research Services Internal Report No. 15/07*

¹⁵ Young, I.A.G., Pierce, G.J., Stowasser, G., Santos, M.B., Wang, J., Boyle, P.R., Shaw, P.W., Bailey, N., Tuck, I. and Collins, M.A. (2006) The Moray Firth directed squid fishery. *Fisheries Research*, **78**: 39-43

¹⁶ Smith, J.M., Pierce, G.J., and Theodossiou, I. (2006) The importance of fishers' knowledge as a management tool: a case of the 2006 decline of the Moray Firth *Loligo* fishery in North East Scotland and the implications for future management strategies. *ICES CM 2007/O-06*

increasing their catch capability. Seine netting produces a higher quality of catch and is more fuel efficient than bottom otter trawlers. Pair seining is similar to pair trawling, but with a seine net being towed between two vessels.

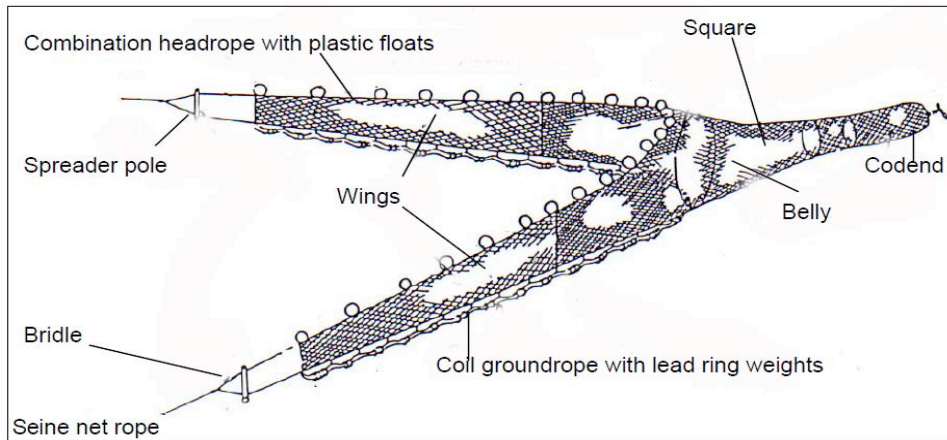


Figure 10.3 Scottish Seine Net (Source: Seafish 2005)

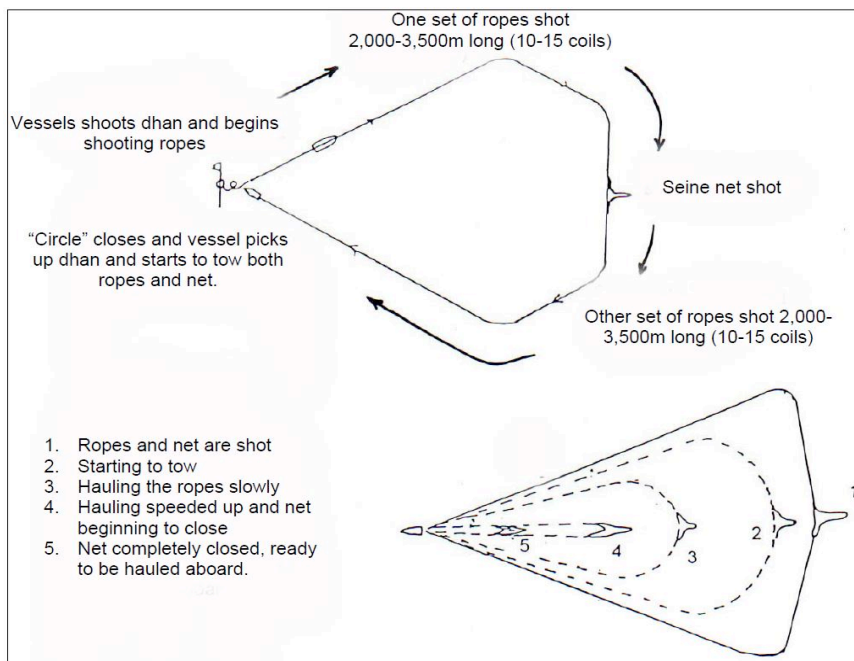


Figure 10.4 Scottish Seine Net Operation (Source: Seafish 2005)

Table 10.3 Gear Dimensions of Vessel C, a Scottish Seine Net Vessel

Fishing vessel	Vessel C
Home port	Wick
Length	26m
Drive type	Hydraulic
Number of trawl winch drums	2
Ground line type	Rockhopper and Soft Ground
Net type	Seine Net
Mesh size	120mm
Estimated headline height	8m
Seine rope diameter	34mm
Length of seine rope carried each side	3300m

10.4 Potting

Pots, or creels, are essentially traps baited to catch mobile shellfish such as lobster, crab species or *Nephrops* (Figure 10.5). Pots are attached to a main line which is deployed from the vessel onto the seabed (Figure 10.6). Pots normally have an average soak time of around three days, although this can be extended during periods of bad weather. The priority of this fishery is to land live catch.

Due to the limited operational range of small, inshore vessels, fishermen generally deploy their creels closer to the coast and in areas which are unsuitable for trawling. The Caithness Static Gear Fishermen's Association (which represents the activities of the approximately 26 creelers) did not feel the MORL Eastern Development would impact upon their activities (pers. comm. Caithness Static Gear Fishermen's Association, December 2010).

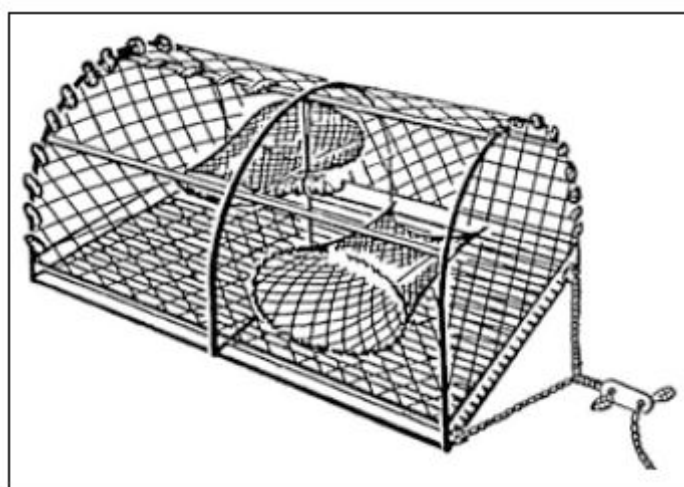


Figure 10.5 Example of a 'Parlour' Lobster Pot (Source: Seafish 2005)

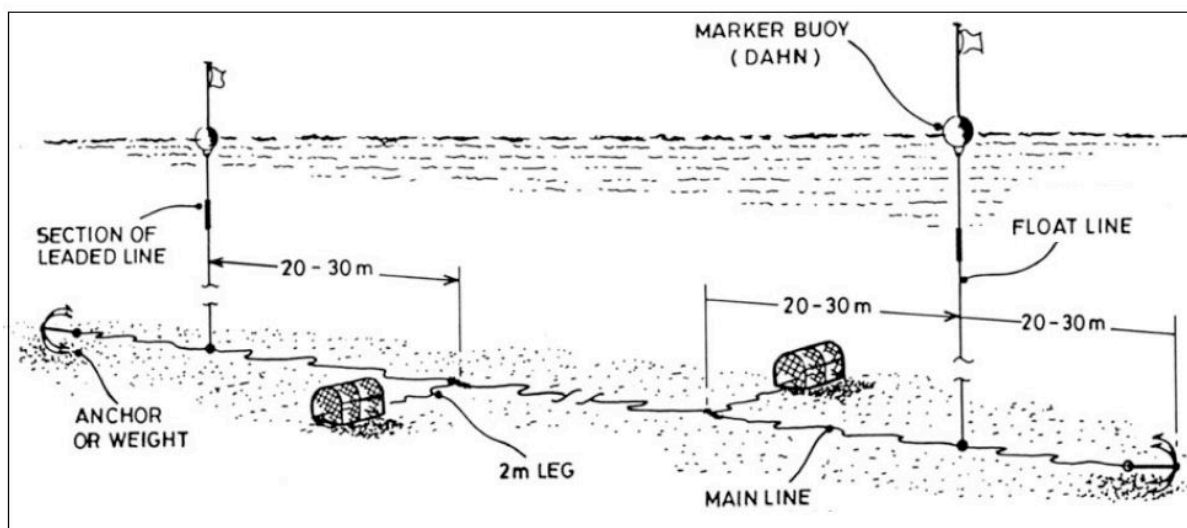


Figure 10.6 Fleet of Pots (Source: Seafish 2005)

The majority of potting vessels are under-10 metres in length, but the scale of the activity can range from a 'hobbyist' fisherman setting around 20 pots, to a vivier crabber which may set more than 3000 pots at one time. Smaller vessels will keep their catch alive in cages on the seabed, while larger vessels will use purpose-built onboard vivier tanks.

There are a number of potting vessels operating on a part-time basis. Generally, these vessels will operate during the summer months and are hauled out over the winter.

Analysis of landings data revealed that the Moray Firth does not record relatively high landings of crab or lobster species, although inshore areas along the Caithness coast and to a lesser extent inshore areas of the southern Moray Firth, do sustain some activity.

11.0 Vessels

With the exception of the nomadic fleet and visiting vessels, the majority of vessels active in the vicinity of the MORL Eastern Development have home ports within the jurisdiction of the following Fishery Districts encompassing the Moray Firth. The primary remit of District Fisheries Officers (DFO) is to ensure compliance with fisheries regulations from vessels within their jurisdiction. In addition, DFOs undertake to keep vessels informed of all changes/amendments to fisheries management policies and of any relevant marine activity that may affect normal fishing practices:

- Buckie (Cullen to the south end of Kessock Bridge, Inverness) District Fishery Office
- Scrabster (Inverness to Strathy Point) District Fishery Office

In addition to vessels under the jurisdiction of these districts, there are vessels from other locations in Scotland and England that will periodically visit the Moray Firth. The majority of these are scallop dredgers and demersal trawlers. Visiting vessels are discussed separately in Section 11.1.1. The fishing grounds of all vessels are discussed in Section 12.0.

11.1 Scallop Fishery

Table 11.1 below lists the six scallop vessels with home ports in the locality of the Moray Firth and which operate within the vicinity of the MORL Eastern Development (pers. comm. scallop fisherman, December 2010). With the exception of Vessel G, all vessels are over-15 metres and hence satellite tracked.

Table 11.1 Scallop Vessels with Home Ports in the Moray Firth

Vessel	Home Port	Vessel Length (m)
Vessel D	Buckie	18.0
Vessel E	Buckie	18.2
Vessel A	Buckie	30.2
Vessel F	Fraserburgh	26.6
Vessel G	Wick	11.5
Vessel H	Wick	16.4

From Table 11.1, it can be seen that the smallest scallop dredger based in the Moray Firth is Vessel G. Due to its size restriction, Vessel G concentrates all of its activity on the Smith Bank and areas adjacent to the west of the MORL Eastern Development (pers. comm. scallop fisherman, November 2010). The remaining scallop vessels in Table 11.1 will spend a proportion of their time fishing in the Moray Firth, in addition to grounds along the east and west coasts of Scotland, the Firth of Forth, the English Channel and the Irish Sea. As mentioned previously, scallop grounds around the UK are fished periodically and therefore the proportion of time spent fishing in the Moray Firth is dependent upon the productivity of the fishing grounds. Of the vessels listed above, the largest is Vessel A. Vessel A is based in Buckie and dredges in the Moray Firth and down the east coast of Scotland. Due to the number of dredges the vessel operates, it targets fishing grounds outside of 12nm. The basic vessel specifications for all vessels listed in Table 11.1 are given in Table 11.2.

Table 11.2 Basic Specifications of the six Scallop Dredge Vessels listed in Table 12.1

	Vessel D	Vessel E	Vessel A
Fishing vessel	Buckie	Buckie	Buckie
Home port	18m	18.7m	30.2m
Length	535hp	540hp	999hp
Main engine power	N/A	N/A	North East of Scotland Fishermen's Organisation/Scottish Fishermen's Federation
Fishing association	5 days	3 days	8 days
Typical fishing trip duration	20nm	1nm to 30nm	12nm to 100nm
Typical distance steamed per trip	12 months	12 months – Spends the summer in the Moray Firth	12 months
Seasonality of activity	300+ days per year	240 days per year	260 days per year
Average no. of days fishing per year	2	2	2
Number of beams per side	10	8	14
Number of dredges per beam	9m each side	9m each side	16.5m
Estimated total gear width	3 knots	2.3 knots	3 knots
Average towing speed	1 hour	1 hour	2 hours
Average towing duration	3nm	2.5nm	6nm
Average tow length			
Fishing vessel	Vessel F	Vessel G	Vessel H
Home port	Fraserburgh	Wick	Wick
Length	26.6m	11.45m	16.4m
Main engine power	298hp	240hp	139hp
Fishing association	N/A	Scottish Fishermen's Federation	N/A
Typical fishing trip duration	N/A	1 day	N/A
Typical distance steamed per trip	N/A	20nm	N/A
Seasonality of activity	12 months	12 months	12 months
Average no. of days fishing per year	N/A	170 days per year	N/A
Number of beams per side	2	2	2
Number of dredges per beam	7	5	N/A
Estimated total gear width	N/A	9.2m	N/A
Average towing speed	3 knots	2.2 to 2.3 knots	N/A
Average towing duration	2 hours	20 to 60 minutes	N/A
Average tow length	6nm	6nm	6nm

Due to increasing restrictions on other fisheries, some demersal trawl vessels are currently using additional gear to target scallops in the Moray Firth. One vessel known to be doing this in the locality of the MORL Eastern Development and areas adjacent to it is Vessel I the specifications for which are given in Table 11.3.

Table 11.3 Vessel I, Multi-Purpose Demersal Trawler and Dredger operating out of Buckie

Fishing Vessel	Vessel I
Home Port	Buckie
Length	9.8m
Main Engine Power	120hp
Fishing Association	N/A
Typical Fishing Trip Duration	1 to 2 days
Typical Distance Steamed per Trip	3 to 30nm
Seasonality of Activity	<i>Nephrops</i> – January to August Squid – August to November Scallops – All year
Average no. of Days Fishing per Year	200 days per year
Average Towing Speed	2 to 2.4 knots
Average Towing Duration	2 to 3 hours
Average Tow Length	7 to 8nm

11.1.1 Visiting Scallop Vessels

Vessels from home ports outside of the Buckie and Scrabster districts seasonally visit the regional study area of the MORL Eastern Development.

Figure 11.1 below shows the relative value of scallop landings around the UK. Scallop landings in the Moray Firth are comparable to landings on the west coast and are slightly lower than scallop landings in the south.

There are between 10 and 20 scallopers based at Scottish west coast ports that will on occasion target scallop grounds in the Moray Firth, between February and August. The number of visiting scallop vessels targeting grounds in the Moray Firth and the amount of time they will spend in the area depends on the productivity of grounds elsewhere, which varies each year. During 2009 a high number of scallopers fished the Moray Firth scallop grounds and remained in the area for several months; however during 2010 the amount of time spent in the area by visiting vessels was much lower, with vessels moving to grounds outside the Moray Firth after one to two weeks (pers. comm. scallop fisherman, December 2010).

The largest vessels of the scallop fleet (those between 25 and 30 metres in length and towing between 16 and 20 dredges per side) are presently more likely to target scallop grounds in the English Channel (pers. comm. scallop fisherman, December 2010).

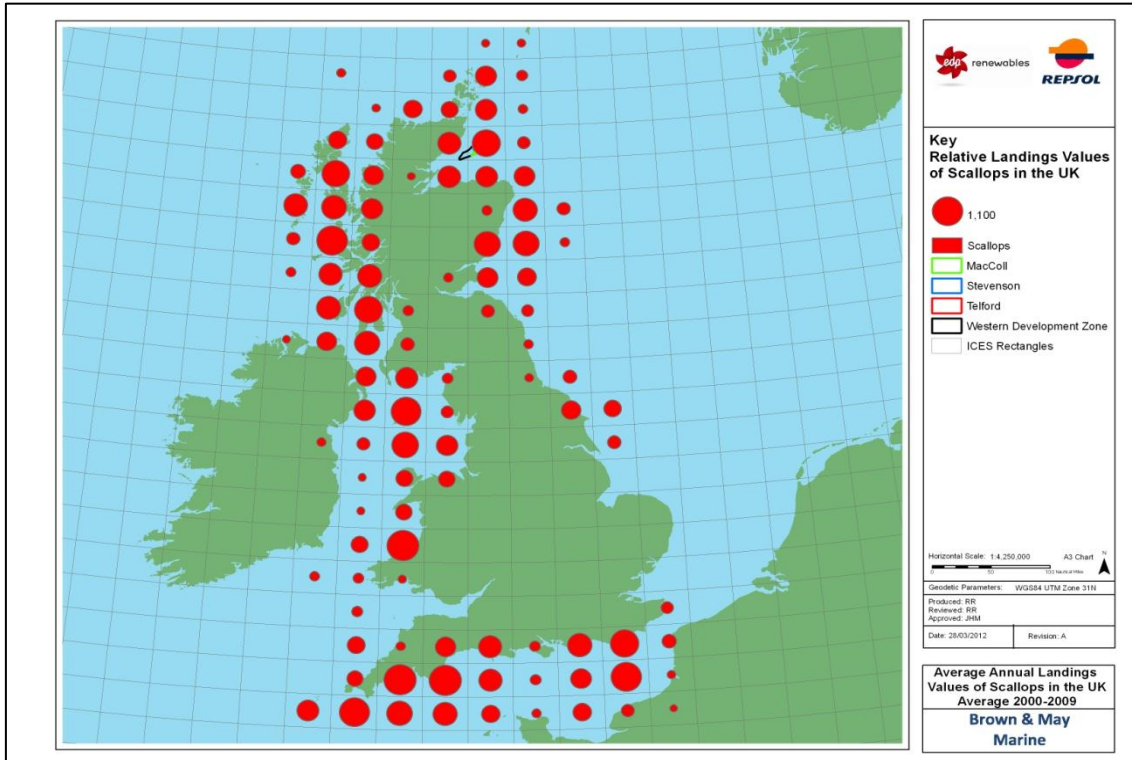


Figure 11.1 Scallop Landings by Value (£) in the UK

Table 11.4 below lists scallop dredges that have home ports outside the Moray Firth but are known to be targeting scallops in the area. The home ports of each vessel can be seen in Figure 11.2. The specifications for four of these vessels are listed in Table 11.5.

Table 11.4 Visiting Scallop Dredges to the Moray Firth

Vessel	Home Port
Vessel J	Annan
Vessel K	Annan
Vessel L	Brixham
Vessel M	Burntisland
Vessel N	Fleetwood
Vessel O	Fleetwood
Vessel P	Girvan
Vessel Q	Kirkcudbright
Vessel R	Kirkcudbright
Vessel S	Kirkcudbright
Vessel 2T	Kirkcudbright
Vessel U	Kirkcudbright
Vessel V	Kirkcudbright
Vessel W	Kirkcudbright
Vessel X	Kirkcudbright
Vessel Y	Kirkcudbright
Vessel Z	Oban
Vessel AA	Oban
Vessel AB	Oban
Vessel AC	Oban
Vessel AD	Peterhead

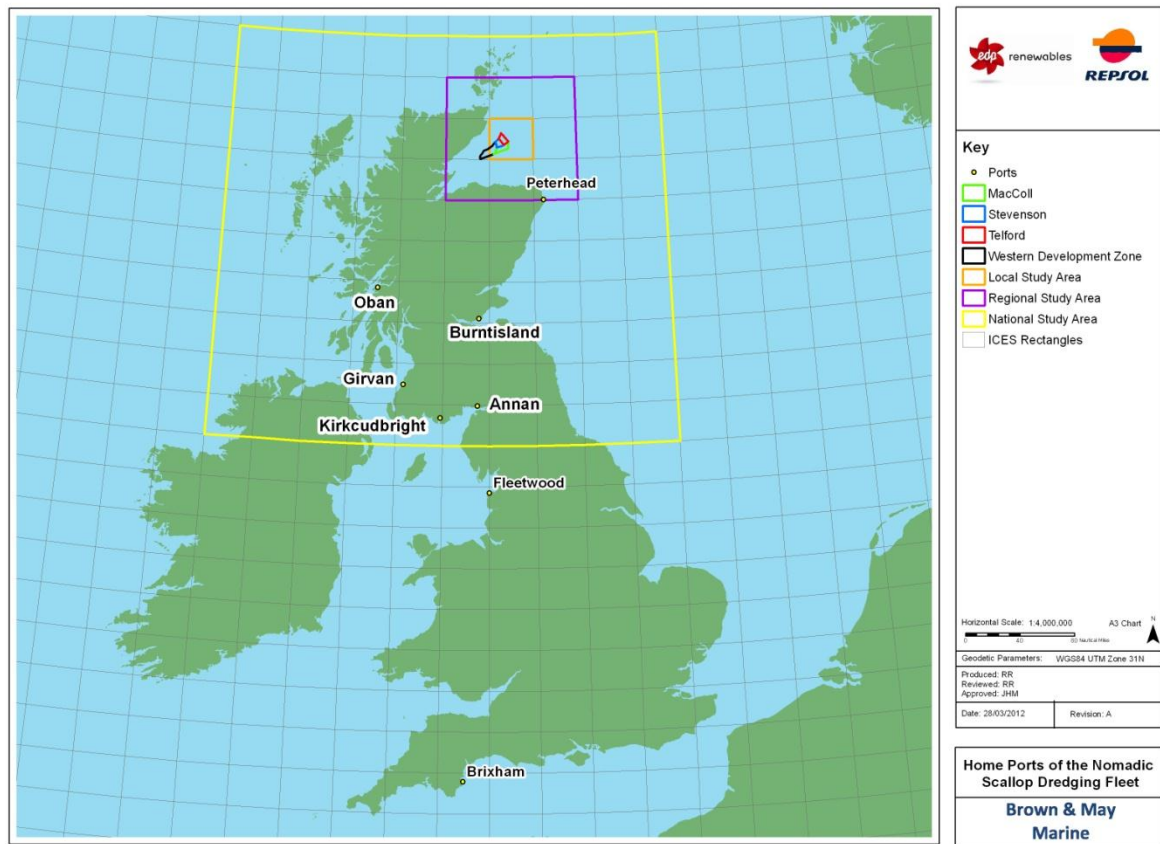


Figure 11.2 Home Ports of the Nomadic Fleet targeting Scallops in the Moray Firth

Table 11.5 Specifications of Vessel K, Vessel P, Vessel M and Vessel AD

Fishing Vessel	Vessel K	Vessel P	Vessel M	Vessel AD
Home Port	Annan	Burntisland	Girvan	Peterhead
Length	15.9	20.3m	18.0m	21.0m
Main Engine Power	269hp	500hp	440hp	625hp
Fishing Association	N/A	Scallop Association	SFO	N/A
Typical Fishing Trip Duration	1 day	10 days	9 days	N/A
Typical Distance Steamed per Trip	N/A	50nm	N/A	N/A
Seasonality of Activity	12 months	12 months	12 months	12 months
Average no. of Days Fishing per Year	N/A	200 days per year	200 days per year	N/A
Average Towing Speed	2.2 to 2.3 knots	2 knots	2.4 knots	N/A
Average Towing Duration	20 to 60 minutes	1.5 hours	1 to 1.5 hours	N/A
Average Tow Length	N/A	3nm	N/A	N/A

11.2 Bottom Trawl Fisheries

Table 11.6 lists the number of trawl vessels registered at ports within the Moray Firth (source: MMO). The list should not however be considered an accurate record of the vessels based in the Moray Firth for the following reasons: individual vessels may have changed their home port; gear category may be inappropriate, and decommissioned/inactive vessels may still be included. In addition, the list does not distinguish between trawlers targeting different fisheries (e.g. *Nephrops* and whitefish trawlers). It is of note however, that more than 80% of the vessels registered at Moray Firth ports are over-15 metres in length and therefore the activities of this vessel category will be captured by the VMS data sets.

Table 11.6 List of Demersal Trawlers registered at Ports within the Moray Firth (source: MMO)

Vessel Length Category	Number of Vessels	MMO Registered Home Ports
Under-10 metres	17	9 Buckie 5 Fraserburgh 1 Burghead 1 Rosehearty 1 Whitehills
10-15 metres	13	6 Fraserburgh 3 Macduff 1 Buckie 1 Inverness 1 Lossiemouth 1 Helmsdale
Over-15 metres	132	70 Fraserburgh 19 Buckie 14 Macduff 10 Gardenstown 7 Whitehills 5 Hopeman 2 Lossiemouth 2 Wick 1 Portknockie 1 Invergordon 1 Portsoy

11.2.1 Whitefish Fishery

11.2.1.1 Demersal Otter Trawls

Table 11.7 below lists three demersal trawl vessels that are based at home ports within the Moray Firth and principally targeting whitefish. It should be noted that these vessels will spend the majority of the year fishing for whitefish in areas outside of the Moray Firth (pers. comm. retired whitefish fisherman, December 2010) and are also able to seasonally target other species such as squid. The specifications for these vessels are listed in Table 11.8.

Table 11.7 Moray Firth Demersal Whitefish Vessels

Vessel	Home Port
Vessel AE	Buckie
Vessel AF	Buckie
Vessel AG	Macduff

Table 11.8 Specifications of Vessel AE, Vessel AF and Vessel AG

Fishing Vessel	Vessel AE	Vessel AF	Vessel AG
Home Port	Buckie	Macduff	Buckie
Length	24.0m	20.6m	21.7m
Main Engine Power	800hp	900hp	675hp
Fishing Association	Fishermen's Association Ltd.	Whitehills Fishermen's Association	Scottish White Fish Producers Organisation Ltd.
Typical Fishing Trip Duration	1 to 8 days	8 to 10 days	10 days
Typical Distance Steamed per Trip	N/A	10 to 100nm	200nm
Seasonality of Activity	Squid – June to November; Whitefish and squid (North Sea and west coast of Scotland) – December to May	Monkfish, megrims and cod – winter months; Squid and haddock – summer months	Monkfish and megrims – January to June; Squid – June to November
Average no. of Days Fishing per Year	200 days	180 days	210 days
Average Towing Speed	N/A	3 knots	3 knots
Average Towing Duration	N/A	2 to 4 hours	2 hours
Average Tow Length	N/A	0.1nm	6nm

11.2.1.2 Seine Nets

The four Scottish seine net vessels principally targeting whitefish species in the Moray Firth are listed in Table 11.9. The vessel specifications of the largest Scottish seine net vessel, Vessel C, are given in Table 11.10.

Table 11.9 Moray Firth Vessels employing Scottish Seine Nets to target Whitefish

Vessel	Home Port	Vessel Length (m)
Vessel C	Wick	26.0
Vessel AH	Wick	25.9
Vessel AI	Fraserburgh	19.4
Vessel AJ	Lossiemouth	24.0

Table 11.10 Vessel C, Scottish Seine Net Vessel operating out of Wick

Fishing Vessel	Vessel C
Home Port	Wick
Length	26m
Main Engine Power	625hp
Fishing Association	Scottish White Fish Producers Organisation Ltd.
Typical Fishing Trip Duration	6 to 8 days
Typical Distance Steamed per Trip	Varies
Target Species	Haddock in the Moray Firth; Cod, whiting, megrim and monkfish elsewhere
Average no. of Days Fishing per Year	200 days per year
Average Towing Speed	1 to 1.5 knots
Average Towing Duration	2 hours
Average Tow Length	1nm to 2nm

11.2.2 *Nephrops* Fishery

Table 11.11 below lists demersal *Nephrops* trawlers based in the Moray Firth. It should be noted that the information received from vessels targeting *Nephrops* includes only vessels under-15 metres in length, which, due to their size, will not be included in the VMS data set.

Table 11.11 Moray Firth Demersal Trawlers who are known to be actively targeting *Nephrops*

Vessel	Home Port	Vessel Length (m)
Vessel BD	Buckie	8.1
Vessel I	Buckie	9.8
Vessel BN	Burghead	6.8
Vessel BS	Burghead	8.5
Vessel BW	Burghead	9.1
Vessel BR	Burghead	9.6
Vessel BX	Burghead	9.8
Vessel AK	Burghead	9.9
Vessel AL	Burghead	9.9
Vessel BO	Burghead	9.9
Vessel BQ	Burghead	10.0
Vessel BT	Burghead	10.0
Vessel BU	Burghead	10.0
Vessel BV	Burghead	10.0
Vessel BY	Burghead	10.0
Vessel AM	Burghead	11.4
Vessel BZ	Burghead	11.5
Vessel BP	Burghead	12.0
Vessel B	Macduff	13.9
Vessel AN	Macduff	14.1

The basic specifications of six of these vessels are listed in Table 11.12. Vessel B and Vessel BY are the only vessels that employ twin rig gear to target *Nephrops*. The remaining vessels solely use single rig gear to target both squid and *Nephrops*.

Table 11.12 Vessel Specifications of the Six Demersal Trawl Vessels Listed in Table 10.9

Fishing Vessel	Vessel I	Vessel AK	Vessel AL
Home Port	Buckie	Burghead	Burghead
Length	9.8m	9.9m	9.9m
Main Engine Power	120hp	150hp	135hp
Fishing Association	N/A	None	N/A
Typical Fishing Trip Duration	1 to 2 days	1 to 2 days	1 day
Typical Distance Steamed per Trip	3 to 30nm	Variable	2 to 25nm
Seasonality of Activity	<i>Nephrops</i> – January to August Squid – August to November Scallops – All year	<i>Nephrops</i> – 8 months Squid – 4 months	<i>Nephrops</i> and squid - 12 months
Average no. of Days Fishing per Year	200 days per year	180 days per year	150 days per year
Average Towing Speed	2 to 2.4 knots	2.4 knots	2.3 knots
Average Towing Duration	2 to 3 hours	Variable	2 hours
Average Tow Length	7 to 8nm	5 to 9nm	4 to 4.5nm
Fishing Vessel	Vessel AM	Vessel B	Vessel AN
Home Port	Burghead	Macduff	Macduff
Length	11.4	13.9m	14.1m
Main Engine Power	143hp	325hp	270hp
Fishing Association	Non-sector	Scottish Fishermen's Federation	Scottish Fisherman's Organisation
Typical Fishing Trip Duration	1 day	1 day	1 day
Typical Distance Steamed per Trip	<i>Nephrops</i> – 15nm Squid – up to 50nm	8nm	2 to 30nm
Seasonality of Activity	<i>Nephrops</i> – April to June Squid – June to November	<i>Nephrops</i> – December to May Squid – June to December	<i>Nephrops</i> – February to May; Squid – June to February
Average no. of Days Fishing per Year	150 days per year	250 days per year	250 days per year
Average Towing Speed	2.2 knots	2.5 knots	2.5 knots
Average Towing Duration	2 hours	<i>Nephrops</i> – 3.5 hours Squid – 2 hours	5 hours
Average Tow Length	4.4nm	<i>Nephrops</i> – up to 10nm Squid – up to 5nm	12nm

11.2.3 Squid Fishery

Vessels listed in the whitefish and *Nephrops* sections above (11.2.1 and 11.2.2) are capable of reconfiguring gear to target squid and as a result, the same specifications apply.

11.2.4 Visiting Demersal Trawl Vessels

The number of vessels targeting squid is dependent upon the productivity of the fishery, and fluctuates each year. The Moray Firth directed squid fishery attracts vessels from home ports elsewhere in Scotland. Vessels will travel from the southeast and west coast of Scotland, as well as from the Shetland Islands. Visiting vessels targeting squid will arrive during June and remain in the area until November. In peak periods, up to 30 vessels may be targeting squid in the Moray Firth, as seen in 2009, which recorded high landings (pers. comm. retired whitefish fisherman; squid fisherman, December 2010). Table 11.13 and Table 11.14 below provide the basic vessel specification of two of the vessels which will seasonally target squid.

Table 11.13 Vessel AO, Demersal Trawl Vessel

Fishing Vessel	Vessel AO
Home Port	Kirkwall
Length	27.8m
Main Engine Power	744hp
Fishing Association	N/A
Typical Fishing Trip Duration	10 days
Typical Distance Steamed per Trip	30 to 360nm
Seasonality of Activity	Squid and whitefish all year
Average no. of Days Fishing per Year	320 days
Average Towing Speed	3 knots
Average Towing Duration	5 hours
Average Tow Length	N/A

Table 11.14 Vessel AP, Demersal Trawl Vessel

Fishing Vessel	Vessel AP
Home Port	Peterhead
Length	30.5m
Main Engine Power	1480hp
Fishing Association	Scottish White Fish Producers Organisation Ltd
Typical Fishing Trip Duration	8 to 10 days
Typical Distance Steamed per Trip	200nm
Seasonality of Activity	Squid – August and September; whitefish – October to July
Average no. of Days Fishing per Year	284 days
Average Towing Speed	3.5 knots
Average Towing Duration	1.5 to 2 hours
Average Tow Length	N/A

11.3 Crab and Lobster Fishery

Table 11.15 below lists the creel vessels registered at ports within the Moray Firth as provided by the MMO, although, as previously stated, the limitations of this information apply. All of the creel vessels in Table 11.15 are under-15 metres in length and therefore their activities will not be included within the VMS data set.

Table 11.15 List of Creelers registered at Ports within the Moray Firth (Source: MMO)

Vessel Length Category	Number of Vessels	MMO Registered Home Ports
Under-10 metres	104	32 Fraserburgh 26 Buckie 11 Wick 6 Brora 6 Lybster 4 Macduff 4 Gardenstown 3 Helmsdale 3 Portmahomack 2 Dunbeath 2 Rosehearty 1 Sandhaven and Pitullie 1 Whitehills 1 Inverness 1 Lossiemouth
10-15 metres	8	2 Buckie 2 Wick 1 Invergordon 1 Lybster 1 Fraserburgh 1 Gardenstown

Currently, there are 12 vessels (Table 11.16) that operate static gear in the Moray Firth and deploy up to 5000 creels in the area at any one time (pers. comm. shellfish fisherman, December 2010). The specifications of these vessels are listed in Table 11.17.

Table 11.16 Creel Vessels Fishing in the Moray Firth

Vessel	Reg. No.	Home Port
Vessel AQ	BCK 608	Buckie
Vessel AR	WK 104	Dunbeath
Vessel AS	WK 122	Helmsdale
Vessel AT	WK 158	Helmsdale
Vessel AU	WK 818	Helmsdale
Vessel AV	WK 15	Inverness
Vessel AW	WK 872	Lybster
Vessel AX	OB 168	Lybster
Vessel AY	OB 299	Lybster
Vessel AZ	WK 810	Wick
Vessel BA	WK 809	Wick
Vessel BB	WK 838	Wick

Table 11.17 Vessel Specifications of the 12 Creel Vessels based in the Moray Firth

Fishing Vessel	Vessel AQ	Vessel AR	Vessel AS	Vessel AT	Vessel AU	Vessel AV
Home Port	Buckie	Dunbeath	Helmsdale	Helmsdale	Helmsdale	Inverness
Length	9.0m	6.5m	8.3m	6.9m	8.0m	10.0m
Main Engine Power	240hp	30hp	210hp	40hp	80hp	150hp
Fishing Association	FAL	N/A	N/A	N/A	N/A	N/A
Typical Fishing Trip Duration	1 day	1 day	1 day	1 day	1 day	1 day
Typical Distance Steamed per Trip	15nm	9nm	6 to 9nm	4nm	8 to 9nm	25nm
Seasonality of Activity	Edible crab, lobster and velvet crab – all year	Edible crab – all year Lobster – summer	Edible crab and lobster – all year	Edible crab and lobster – all year	Edible crab and lobster – all year	Edible crab and lobster – all year
Average no. of Days Fishing per Year	Mackerel – June to September 8 to 50m	200 days per year Summer – 15m Winter – 30m	Velvet crab – summer 215 days per year Summer – 27 to 36m Winter – 45m	Velvet crab – summer 275 days per year 25 to 28m	Velvet crab – summer 250 days per year Summer – 6 to 8m Winter – 43 to 45m	Whelks – May to September 140 days per year Summer – 20m Winter – 20 to 60m
Typical Depth Fished	Directional	Parallel to shore	Parallel to shore	Along seabed contours, mainly east to west	Parallel to shore	No specific direction
Deployment Method	2 to 3 days	2 days	Half of the fleet per day	1 day	Summer – 1 day Winter – half the fleet per day	Crab and lobster - half of the fleet per day Whelks – 3 days
Typical Soak Time						
Fishing Vessel	Vessel AW	Vessel AX	Vessel AY	Vessel AZ	Vessel BA	Vessel BB
Home Port	Lybster	Lybster	Lybster	Wick	Wick	Wick
Length	7.3m	11.4m	10.8m	13.0m	9.9m	10.0m
Main Engine Power	31hp	125hp	130hp	250hp	185hp	160hp
Fishing Association	N/A	N/A	N/A	N/A	N/A	N/A
Typical Fishing Trip Duration	1 day	1 day	1 day	1 day	1 day	1 day
Typical Distance Steamed per Trip	2.5nm	3nm	2 to 10nm	5 to 10nm	8 to 12nm	0.5 to 14nm
Seasonality of Activity	Edible crab, velvet crab and lobster – all year	Lobster – all year Edible and velvet crab – July to November	Edible crab, lobster and velvet crab – all year	Edible crab and lobster – all year	Edible crab and lobster – all year	Edible and velvet crabs – all year
Average no. of Days Fishing per Year	250 days per year 30 to 40m	250 days per year Summer – 30m Winter – 46m	200 days per year Summer – 10m Winter – 30m	200 days per year 70m	200 days per year	200 days per year
Typical Depth Fished	Parallel to shore	Parallel to shore	Parallel to shore	Mainly north to south	Along edge contours, mainly southwest to northeast	Along bottom contours
Deployment Method	Half of the fleet per day	Half of the fleet per day	Half of the fleet per day	Half of the fleet per day	Half of the fleet per day	Half of the fleet per day
Typical Soak Time						

12.0 Fishing Grounds

The charts below have been produced using information provided by individual fishermen on paper charts.

12.1 Scallop Fishing Grounds

Due to sediment preference, scallop grounds are located in areas throughout the Moray Firth; on the Smith Bank, along the southern and western coastlines and offshore to the east of the Firth. Figure 12.1 below shows the scallop grounds in the Moray Firth relative to the MORL Eastern Development.

12.2 Whitefish Fishery Grounds

Figure 12.2 below illustrates the whitefish fishing grounds in the Moray Firth. It can be seen that the principal species targeted is haddock, with grounds in the northern area of the Eastern Development.

12.3 *Nephrops* Fishing Grounds

Figure 12.3 below shows the location of *Nephrops* grounds. Due their size, it is considered that these grounds are an indication of *Nephrops* grounds targeted by the under-15 metre fleet. There is currently one vessel that targets *Nephrops* on the southern section of the MORL Eastern Development. It can be seen that grounds are for the most part located in the southern Moray Firth particularly in areas in the inner Firth.

12.4 Squid Fishery Grounds

Figure 12.4 below shows the Moray Firth squid fishing grounds. A number of vessels seasonally target grounds in locations across the Moray Firth and including Eastern Development site.

12.5 Crab and Lobster Fishery Grounds

Figure 12.5 shows crab and lobster grounds are located to the south and west of the MORL Eastern Development, generally along the coastline. There are no identified static gear grounds in the Eastern Development site.

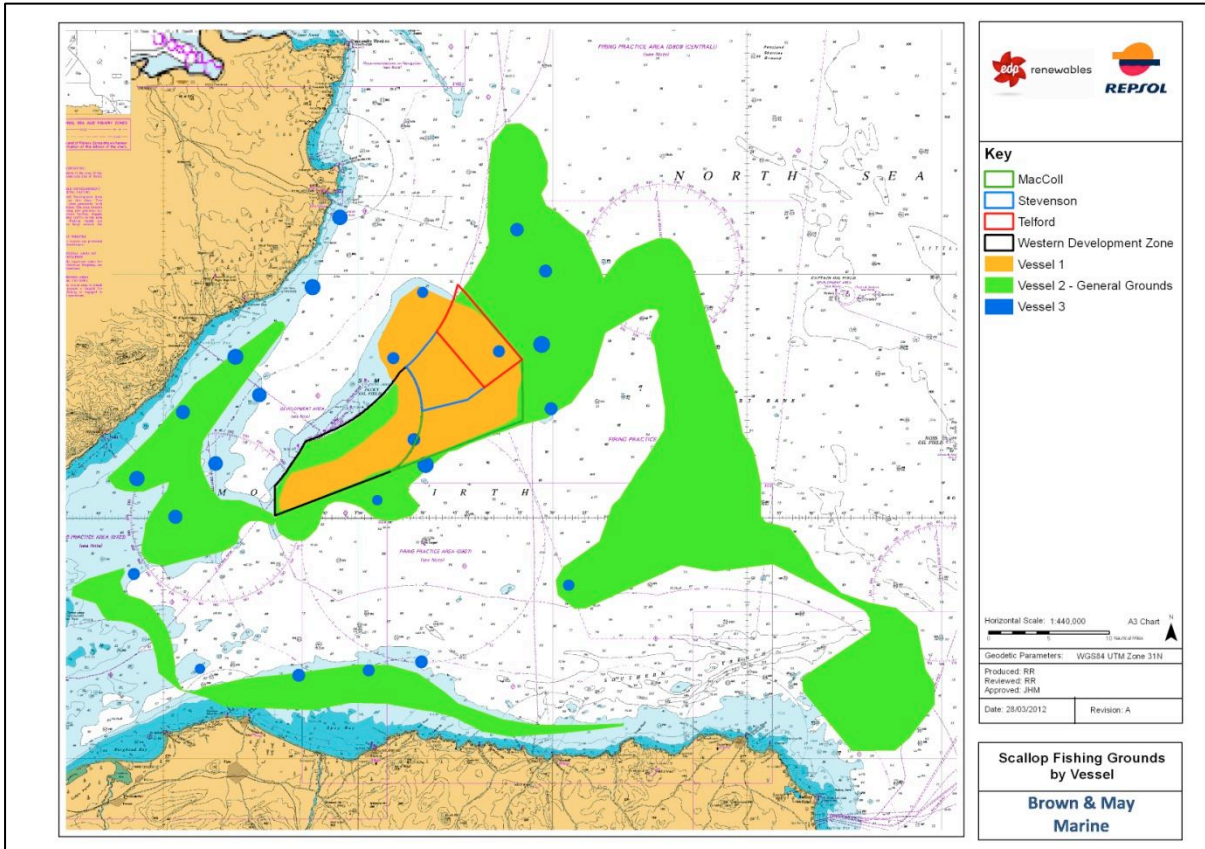


Figure 12.1 Moray Firth Scallop Fishing Grounds

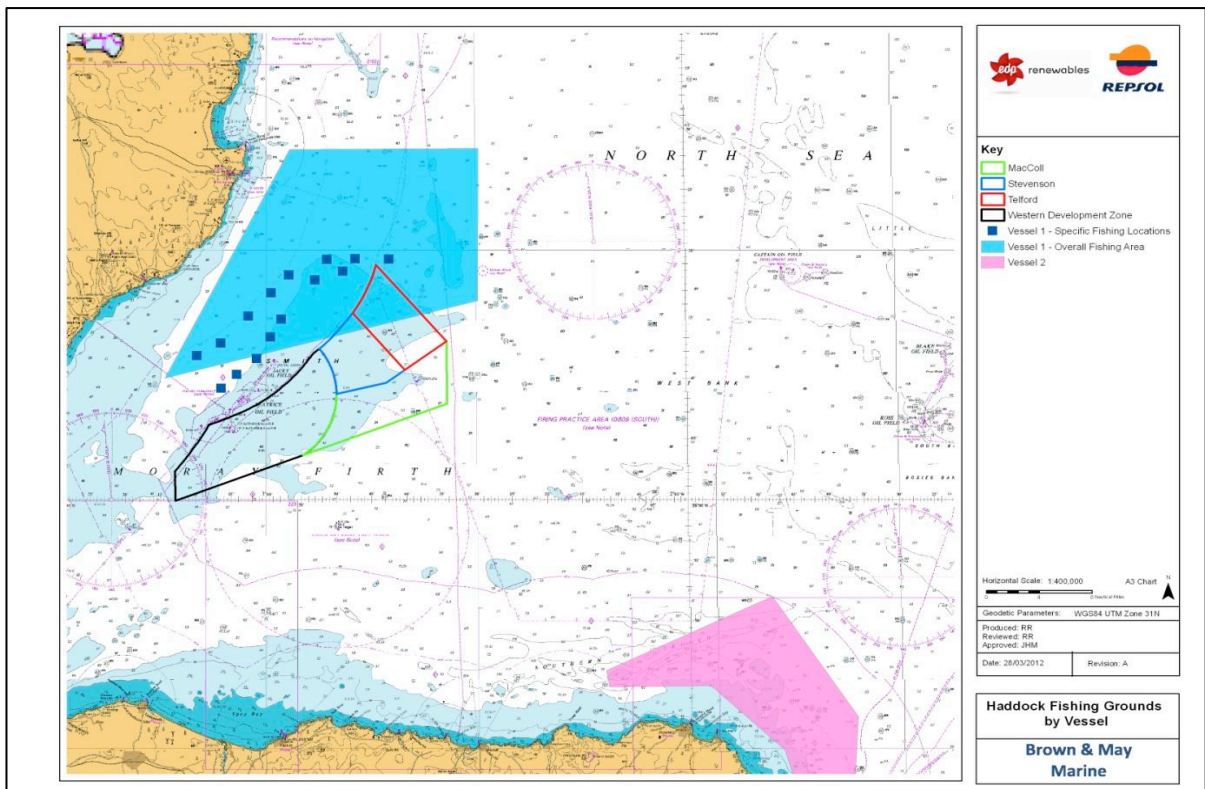


Figure 12.2 Moray Firth Haddock Fishing Grounds

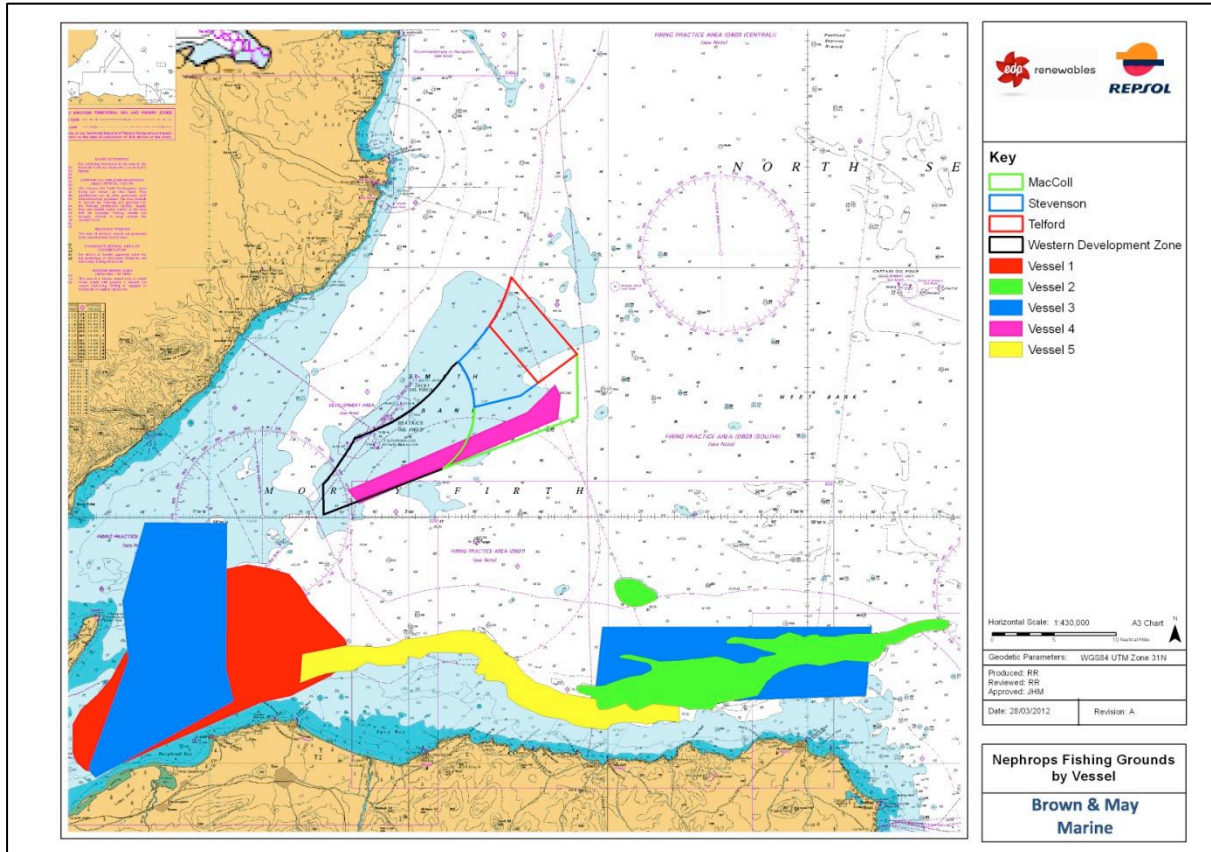


Figure 12.3 Moray Firth *Nephrops* Fishing Grounds

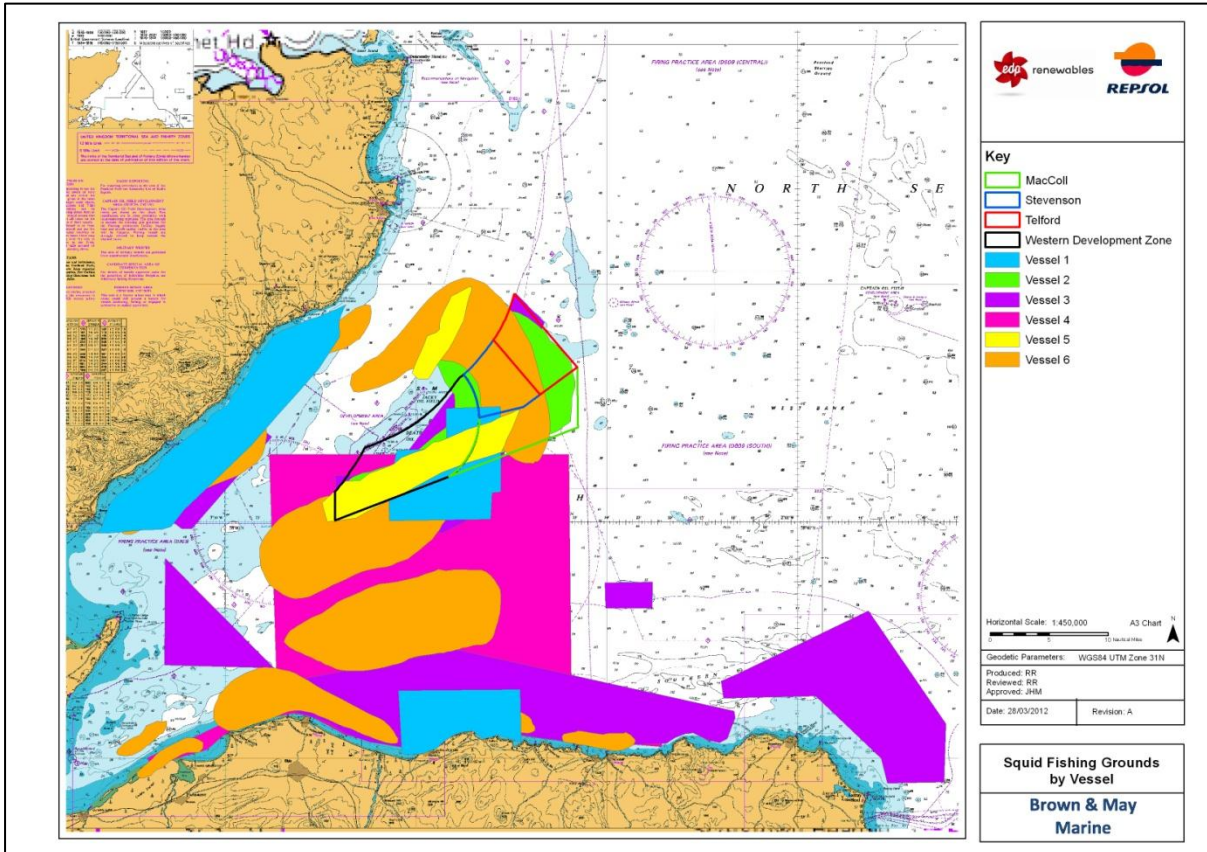


Figure 12.4 Moray Firth Squid Fishing Grounds

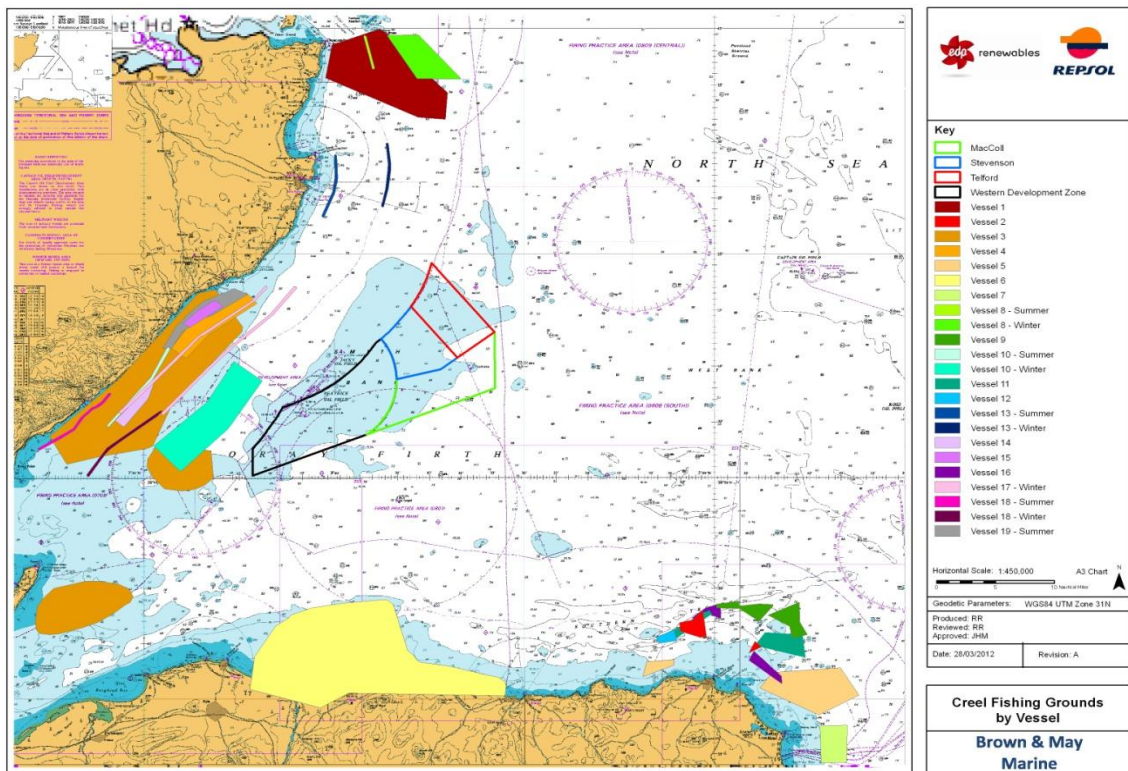


Figure 12.5 Moray Firth Creel Fishing Grounds

13.0 Future Fisheries

Commercial fishing activities are not constant; patterns of fishing activity fluctuate both annually and on a longer term basis. Due to this, predictions of future fishing activity can be complicated and potentially misrepresentative. Below is a short summary of the potential changes in current fishing activities that may occur in the future.

13.1 Scallop Fishery

Marine Scotland Science recommends that to protect scallop stocks and effectively manage the fishery, restrictions on the number of vessels entering the scallop fleet and increases in the minimum landing size are introduced in the near future¹⁷.

It is possible that additional restrictions as a result of conservation management measures, such as those closures enforced in Cardigan Bay and the Isle of Man, may occur in the future.

13.2 Whitefish and Flatfish Fisheries

As has been previously stated, recent years have seen a return of the haddock and mackerel fisheries to the area (pers. comm. retired whitefish fisherman, December 2010) and therefore it is possible that other whitefish or flatfish species could once again become a commercially targeted species if stocks were to return to sustainable levels.

13.3 Nephrops Fishery

Although the status of *Nephrops* stocks in the Moray Firth is currently considered to be sustainably exploited, it is possible that fishing pressure may have a future impact on stock levels.

13.4 Squid Fishery

Squid populations are currently perceived to be resistant to fishing pressure, however as squid have a relatively short life span, there are growing concerns that overfishing will result in limited numbers of spawning stock and a population depletion. As the Moray Firth is a potential spawning area (squid eggs have been found on creels in the area), it is considered that these grounds need to be identified to effectively manage and protect future stocks¹⁸.

Predicting the future of squid stocks is complicated and potentially misrepresentative due to the erratic fluctuations in stocks and squids high sensitivity to environmental factors. Current day factors, such as climate change and rising sea temperatures pose a risk to discrete squid populations as they continue to move to higher latitudes¹⁹.

Predicting the seasonality of squid stocks can also be difficult as it can vary annually. Vessels targeting squid are currently beginning earlier and finishing later each year. A major concern of the inshore fishermen is the early depletion of squid stocks as it leaves them with few alternative options for the remainder of the year (pers. comm. squid fisherman, December 2010).

¹⁷ Keitz, S. and Bailey, N. (2010) Fish and Shellfish Stocks 2010. *Marine Scotland Science. The Scottish Government*

¹⁸ Young, I.A.G., Pierce, G.J., Stowasser, G., Santos, M.B., Wang, J., Boyle, P.R., Shaw, P.W., Bailey, N., Tuck, I. and Collins, M.A. (2006) The Moray Firth directed squid fishery. *Fisheries Research*, 78: 39-43

¹⁹ Hastie, L., Pierce, G., Pita, C., Viana, M., Smith, J. and Wangvoralak, S. (2009) Squid Fishing in UK Waters. *Report to SEAFISH Industry Authority*

As a result of the relatively recent focus on the squid fishery, there is the potential for fishing practises to be further adapted to better target the species. 'Jigging' for example, could be used in the Moray Firth, and is already to a small degree, although to mixed reviews. Jigging is fishing using a multi-hooked line and a mechanical, and nowadays computerised, jigger. The hooks are disguised with feathers or fish-like lures to attract the target species, and jigged up and down a few inches to seem lifelike. Fishing by this mode is done mainly inshore, but abler craft would pursue shoaling fish offshore. There is the possibility that jigging could be increasingly used in the future²⁰. A Seafish study also considers that there are more productive marketing opportunities for squid in the UK than are currently exploited²¹.

13.5 Bivalve Fishery

There is potential for the development of bivalve fisheries within the Moray Firth, including fisheries for razor clams, mussels and cockles. Razor clams are currently targeted on the Navity Bank in the Moray Firth²². The fishery is at present small in comparison to fisheries elsewhere, but it is an important local resource with scope for future expansion²³.

The common mussel is widely distributed throughout the Moray Firth and a large wild mussel fishery is managed in the Dornoch Firth by the Highland Fresh Mussels Ltd. on behalf of the Highland Council²⁴. As mussels are found in many places the Moray Firth²⁵, there is potential for future development.

Cockles from the Moray Firth are targeted in the Inver Bay in the Dornoch Firth and at Culbin Sands in the inner Moray Firth. There are also proposed cockle fisheries in other areas of the Firth. Landings of cockles from the area are modest, especially compared to cockle fisheries elsewhere, but the fishery is still an important local resource with room for expansion²⁶. The Moray Firth IFG Committee considers that the fishery has historically represented a 'boom or bust' industry, attracting large cockle dredges when stocks are high, which will effectively deplete stocks for a number of years²⁷. Due to a strong European market, there is high potential for a future productive fishery²⁸.

13.6 Sandeel Fishery

Sandeels are a crucial component of many marine ecosystems, providing food for bird, fish and marine mammal species. Historically, sandeels are targeted as part of an industrial fishery, exploited to provide fish meal and oil for rearing livestock and farmed fish. Concerns arose over the impacts on bird species and other commercially exploited fish species, which saw the closure of the Scottish east coast sandeel fishery in 2000²⁹. Scientific surveys to monitor the population abundance of sandeels have been ongoing and in 2009 the fishery was reopened in the North Sea with a quota of 200,000 tonnes (MMO statistics), although there still remains a moratorium on the fishery along the

²⁰ Young, I.A.G., Pierce, G.J., Stowasser, G., Santos, M.B., Wang, J., Boyle, P.R., Shaw, P.W., Bailey, N., Tuck, I. and Collins, M.A. (2006) The Moray Firth directed squid fishery. *Fisheries Research*, 78, 39-43

²¹ Hastie, L., Pierce, G., Pita, C., Viana, M., Smith, J. and Wangvoralak, S. (2009) Squid Fishing in UK Waters. *Report to SEAFISH Industry Authority*

²² The Moray Firth Partnership (2007) Commercial use of the Cromarty Firth [Online] Accessed 06/01/11: www.morayfirth-partnership.org

²³ The Moray Firth Partnership (2006) Moray Firth Partnership Fisheries Topic Group [Online] Accessed 06/01/11: www.morayfirth-partnership.org

²⁴ The Moray Firth Partnership (2003) Moray Firth Matters; Fishing in the Moray Firth [Online] Accessed 07/01/11: www.morayfirth-partnership.org

²⁵ The Moray Firth Partnership (2003) Moray Firth Matters; Fishing in the Moray Firth [Online] Accessed 07/01/11: www.morayfirth-partnership.org

²⁶ The Moray Firth Partnership (2006b) Fishing Today [Online] Accessed 07/01/11: www.morayfirth-partnership.org

²⁷ Moray Firth IFG Committee (2009) Meeting Minutes 28th August 2009

²⁸ Moray Firth IFG Committee (2010) Meeting Minutes 19th March 2010

²⁹ Daunt, F., Wanless, S., Greenstreet, S.P.R., Jensen, H., Hamer, K.C. and Harris, M.P. (2008) The impact of the sandeel fishery closure on seabird food consumption, distribution, and productivity in the northwestern North Sea. *Can. J. Fish. Aquat. Sci.* 65: 362-381

Scottish east coast. Recent years have seen an increase in sandeel populations in the harbours and bays around the Moray Firth (pers. comm. retired whitefish fisherman, December 2010).

13.7 Foreign Vessel Activity

Although there is currently no known foreign fishing activity within the MORL Eastern Development, this is not guaranteed for the future as any EU Member State vessel could potentially target grounds outside 12nm.

14.0 Consultation List

Consultation and liaison has been ongoing, and will continue, with the following organisations:

- Fisheries Industry Representatives (FIRs)
- Scottish Fishermen’s Federation (SFF)
- Scallop Association
- North East IFG
- Caithness Static Gear Fishermen’s Association
- Fishermen’s Association Ltd
- Fraserburgh full time creelers
- Whitehills Harbourmaster
- Scrabster Fishery Office
- Buckie Fishery Office
- Fraserburgh Fishery Office

The skippers of the vessels listed in Table 14.1 contributed detailed information to the identification of the commercial fishing baseline:

Table 14.1 Vessels whose skippers contributed to the Commercial Fishing Baseline

Vessel	Home Port	Vessel Type
Vessel AQ	Buckie	Creeler
Vessel AR	Dunbeath	Creeler
Vessel AS	Helmsdale	Creeler
Vessel AT	Helmsdale	Creeler
Vessel AU	Helmsdale	Creeler
Vessel AV	Inverness	Creeler
Vessel AW	Lybster	Creeler
Vessel AX	Lybster	Creeler
Vessel AY	Lybster	Creeler
Vessel AZ	Wick	Creeler
Vessel BA	Wick	Creeler
Vessel BB	Wick	Creeler
Vessel AE	Buckie	Demersal Trawler
Vessel AF	Buckie	Demersal Trawler
Vessel AM	Burghead	Demersal Trawler
Vessel AL	Burghead	Demersal Trawler
Vessel AK	Burghead	Demersal Trawler
Vessel AO	Kirkwall	Demersal Trawler
Vessel AN	Macduff	Demersal Trawler
Vessel B	Macduff	Demersal Trawler
Vessel AG	Macduff	Demersal Trawler
Vessel AP	Peterhead	Demersal Trawler
Vessel I	Buckie	Demersal Trawler/ Scallop Dredger
Vessel K	Annan	Scallop Dredger
Vessel D	Buckie	Scallop Dredger
Vessel E	Buckie	Scallop Dredger
Vessel A	Buckie	Scallop Dredger
Vessel M	Burntisland	Scallop Dredger
Vessel P	Girvan	Scallop Dredger
Vessel AD	Peterhead	Scallop Dredger
Vessel G	Wick	Scallop Dredger
Vessel C	Wick	Seine Netter

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