

MAINSTREAM RENEWABLE POWER

Neart Na Gaoithe Offshore Wind Farm

Commercial Fisheries Assessment

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1.0 Glossary of Terms

BMM – Brown and May Marine Limited
BWEA – British Wind Energy Association
CFP – Common Fisheries Policy
EC - European Commission
EU – European Union
FMA – Fishermen’s Mutual Association (Pittenweem)
hp - horsepower
ICES – International Council for the Exploration of the Sea
IFG – Inshore Fisheries Group
MMO – Marine Management Organisation
NM – nautical mile
SI – Statutory Instrument
TAC – Total Allowable Catch
VMS – Vessel Monitoring System

Under-10 metre –Category of fishing vessels that are less than 10 metres in length
10-15 metre – Category of fishing vessels that are between 10 and 15 metres in length
Over-15 metre – Category of fishing vessels that are greater than 15 metres in length

12 NM Limit – Territorial waters of EU Member states extend to 12 NM. Member States manage these waters exclusively within these limits
6 NM Limit – exclusive access to UK vessels only within 6 NM
6 NM-12 NM Limit – some access to certain EU Member States in identified areas around the UK coast, based upon historic access.

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 Mainstream Renewable Power Offshore Wind Farm development, Neart na Gaoithe, taking into account of Food and Environment Protection Act (1985), Coast Protection Act (1949), Defra and Cefas requirements as specified in the 2004 Guidelines (Cefas 2004) and British Wind Energy Association (BWEA) 2004 Recommendations (BWEA 2004).

In the case of the wild salmon and sea trout fisheries, a combination of the regional socio-economic importance of these activities and the potential significance of impact from the proposed development is such that they have been separately assessed.

As there is no single data source or recognised model for establishing commercial fisheries baselines within small, discrete sea areas such as wind farm sites the following description of the baseline has, therefore, 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 a constantly changing picture. Fishermen are required to adapt to these pressures as best they can, and fishing practices may change as a result.

3.0 Study Areas

The study areas for the assessment of commercial fishing intensity and values are shown in Figure 3.1 below. The approach has been to provide a national overview, and to describe the regional area down to the local area, and the specific area of the proposed development.

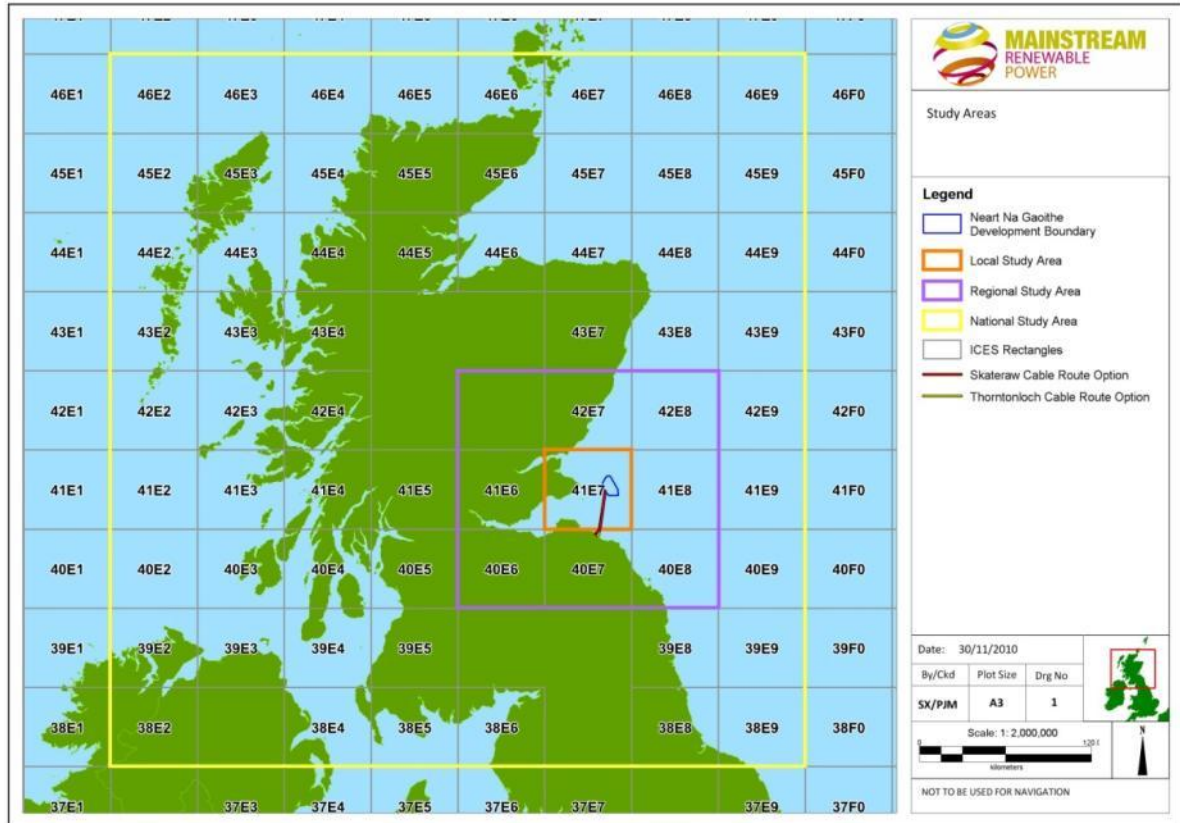


Figure 3.1 Study Areas

4.0 Data and Information Sources, Sensitivities and Qualifications

The principal sources of data and information used were:

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

Consultation with local fishermen was principally undertaken by Brown and May Marine Limited (BMM), in association with the Scottish Fishermen's Federation and the Fishing Industry Representatives.

Analysis of the data and information sources used for the commercial fishing assessment are subject to the qualifications, limitations, sensitivities and gaps discussed below:

It should be noted that fishing terminology may vary with each dataset. Specifically, in England static gear used to target shellfish such as crab and lobster is known as 'pots' and the activity, 'potting', whereas pots in Scotland refers only to gear used to target whelks. 'Creels' or 'creeling' is Scottish terminology commonly used to describe the activity. The datasets assessed subsequently in this report variously employ different terminology.

4.1 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 EC and member states. The boundaries of ICES rectangles align to 1° of longitude and 30' of latitude. As is apparent from Figure 3.1 above, however, the areas of ICES rectangles are very large relative to the proposed development, which is situated in ICES rectangle 41E7. Analysis of fisheries statistics by ICES rectangle should therefore take into account the small proportion of a statistical area, and hence activity, that the proposed development covers.

4.2 MMO Fisheries Statistics

The MMO collects and collates fisheries data by ICES rectangle for the whole of the UK. The principal source of data comes from the European Commission (EC) daily log sheets that over 10 metre vessels are required to complete and submit.

Vessels of under-10 metres in length are currently not obliged to submit daily log sheets although voluntary submissions can be made and, in addition, local fisheries officers undertake dockside checks on under-10 metre vessels. The Shellfish Entitlement Scheme, introduced in 2004 (discussed further in Section 5.5) and the "Registration of Buyers and Sellers of First Sale Fish and Designation Auction Site Scheme", introduced in 2005, further contribute to the collection of fisheries data for the under-10 metre fleet. It should be noted that the MMO fisheries statistics for this category in years prior to the introduction of these schemes, may, to some extent, underestimate the true levels of fishing in areas where a large percentage of the activity is by vessels within this category.

For the purposes of analysing fishing vessels by length and in light of the varying management measures applying to vessels of different lengths, MMO datasets divide vessels into three categories: over 15 m vessels, 10-15 m vessels and under-10 m vessels.

It should be noted that vessels referred to as “non-UK” in the MMO fisheries data includes only foreign vessels landing into UK ports. Non-UK vessels fishing in the area but landing into non-UK ports are not recorded. The values given for non-UK vessels derived from the analysis of this data set should therefore not be taken as an indication of the total foreign activity in the area.

4.3 MMO Surveillance Sightings

Surveillance sightings in UK waters are recorded by fishery protection aircraft and surface craft as a means of policing fisheries legislation. Marine Scotland Compliance is responsible for this activity in Scottish waters. This type of data provides a good indication of the distribution of fishing activity by method and nationality, but it should not however be used for quantitative assessments of fishing activity, given the low frequency of the flights over an area, which is generally once a week and only during daylight hours.

4.4 MMO UK Satellite Tracking (VMS) Data

Since 2005, satellite tracking of European Union (EU) registered vessels applies to all vessels of more than 15 metres in overall length. Previously, only vessels above 18 m were tracked. The positions of the vessels are transmitted approximately every two hours via satellite link to the MMO and other national EU control centres. The MMO receives information on all UK vessels irrespective of location, and of foreign vessels within UK waters. The MMO however, cannot disclose data on foreign vessels without prior permission from the regulating body of the applicable member state. Vessel position plots do not differentiate between vessels steaming and fishing and disclosure of UK vessels’ identities is restricted under the Data Protection Act (1998).

It should be noted that there has been a recent change in EU policy with regards to the release of satellite tracking data. The coordinates of the vessels can no longer be released; instead the number of plots by vessel type in a grid of rectangles of approximately 70 NM² is given. The 2009 data has therefore been analysed independently from the 2005-2008 dataset, given these differences in format.

4.5 Fishermen and Fishermen’s Representatives

Consultation has been undertaken with individual skippers and their representatives, and information collected and collated from these sources. It is possible that certain individuals, and likely unaffiliated, stakeholders may not have been identified during the course of this assessment. In the event that additional information is provided prior to the completion of the Environmental Impact Assessment, the baseline will be revised to reflect this.

5.0 Fisheries Controls and Legislation

Whilst the international aspect of European fisheries negotiation, such as the settings of quotas (quotas are measured as the quantity of a species that can legally be landed), 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

All vessels engaged in commercial fishing must hold a valid fishing 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 it for profit. The system is designed to prevent increases in both fleet numbers and catching capacities through a system of vessel capacity units. In addition to limiting any further increases in fishing vessel numbers, decommissioning schemes have, over the past 20 years, resulted in significant reductions in the numbers of UK and certain other member states' fleets.

Since 1983 the structure and capacity of the UK and Scottish fishing fleets have been primarily dictated by the EU Common Fisheries Policy (CFP). Between 1997 and 2002 the Multi Annual Guidance Programme within the CFP was devised to manage fleet structures; fishing by method (i.e. whitefish trawl, nephrops trawl, etc) was restricted by capacity limits (number of vessels) and effort reduction targets. When this programme ended it was replaced by member state level controls which impose effort level ceilings through a system of exit/entry restrictions. In essence, fleet capacity (number of vessels) cannot be increased, allowing vessels only to enter the fleet when an equivalent or larger capacity has exited the fleet.

One of the most significant impacts upon the Scottish fleet in recent years has been the two successive decommissioning schemes in 2001-2002 and 2003-2004, under which 165 vessels were removed from the national demersal fleet.

In 2010 the Scottish Government introduced Licence Parking, or the Fleet Resilience Scheme, as a measure to help the fleet adjust to current, restrictive conditions. The principle is to enable multiple existing fishing licenses to be combined and placed upon a single fishing vessel – thus sharing it – in order to reduce fixed and variable costs over both the short and long term. Alternatively, those wishing to leave the industry may be bought out and their effort concentrated on remaining vessels (under current licensing rules this is not possible). The process of 'parking' is however reversible; a parked license can be 'unparked'. Over 40 vessels have applied for this scheme to date (2010). In consultation with industry stakeholders and the Scottish Fisheries Council, Ministers have now also introduced a publicly funded (co-funded by the European Fisheries Fund) fleet resilience grant scheme aimed at disposing of those vessels made dormant through license parking.

5.2 Territorial Limits

Member States' territorial fishing limits extend out to 12 NM. With some exceptions, access within 6 NM of the coast is restricted to the vessels of that Member State. Only vessels from other member states with historic rights are allowed access within the UK's 6-12 NM limit. There are no historic rights for other Member State's vessels within Scotland's 6-12 NM limit off the east coast, and hence within the area of the proposed development.

It should be noted that a number of UK 'flagged' fishing vessels are under foreign ownership, which could potentially fish within the UK 12 NM limit.

5.3 Quota Restrictions

Quotas are measured as the quantity of a species that can legally be landed. The Scottish Government manages the quota for fish stocks and controls the activities of fishing vessels and fishing effort (days at sea) in the Scottish waters of the North Sea, West of Scotland and Faroese waters, plus all inshore fisheries within the 12 mile territorial limit¹. Such controls and regulations have had, and will continue to have, impacts on existing and future commercial fisheries baselines.

The principal remit of the CFP, ratified in the early 1980s, is the long-term conservation of fish stocks in EU waters. A central element of the CFP is a system of quotas by ICES area and sub-area. Species identified as requiring management are defined as pressure stocks. Annual Total Allowable Catches (TACs) are allocated for each pressure stock by area or sub-area. Quotas are measured as the quantity of landed fish.

National, regional and individual quotas for the over-10 metre fleet are assigned on the basis of historical rights. Vessel quotas are in effect tangible assets which can and are sold or leased, and national quotas may be exchanged or swapped between member states.

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 as a result of its proportionally very high quota allocation. The species is targeted in deep, offshore waters and the TAC is not limited to Area IV.

Figure 5.2 shows the UK only total TAC (top 10 species) in Area IV. It can be seen that herring 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.

The system of quotas has however been criticised by those within the industry as a conservation measure despite being in place for more than 20 years as the primary stock conservation measure of the CFP. It is recognised that regulation by quotas encourages the discarding of either undersized or over-quota fish at sea. In recognition of failings such as this, the CFP is currently under reform, which could result in significant changes to future fisheries management policies and legislation.

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

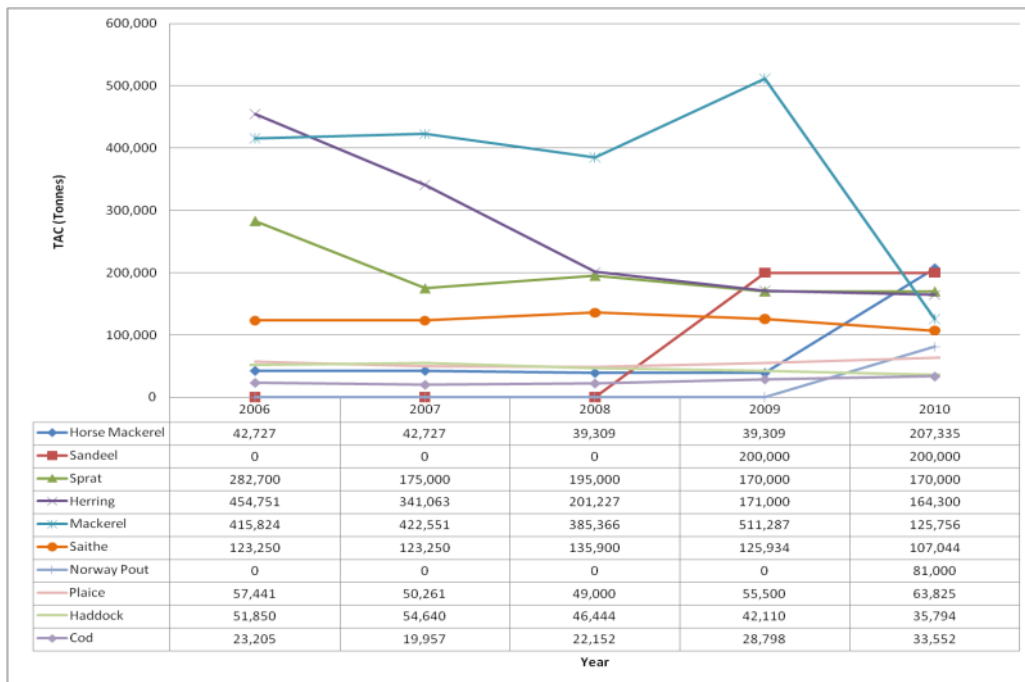


Figure 5.1 TACs (top 10 species) in ICES Area IV (North Sea), all Countries, 2006-2010 (excluding blue whiting) (MMO)

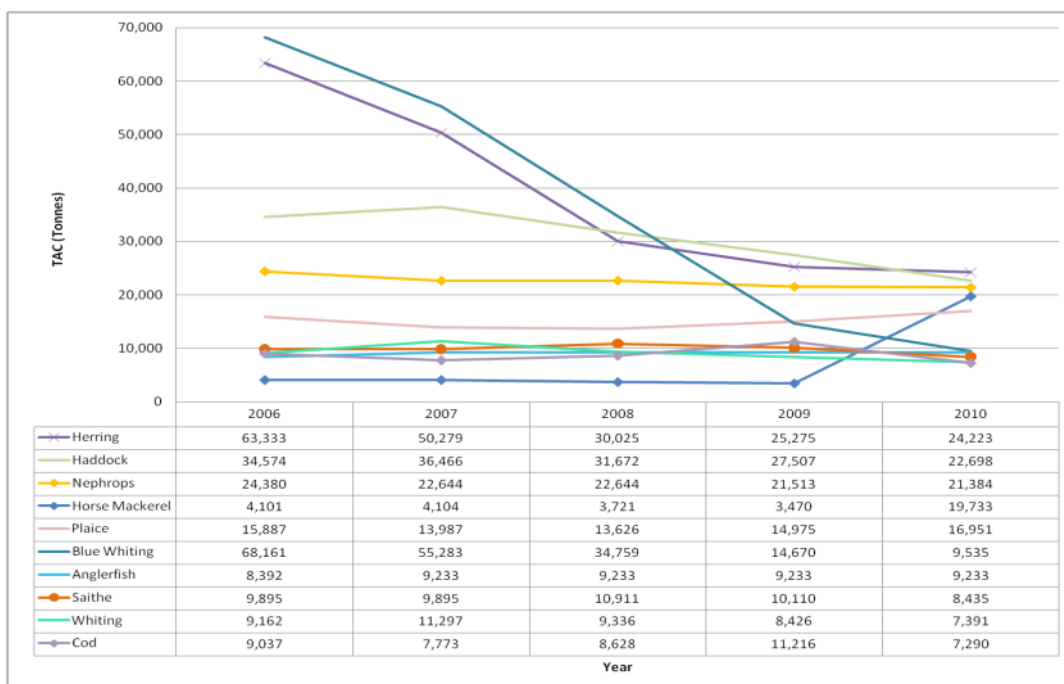


Figure 5.2 TACs (top 10 species) in ICES Area IV (North Sea), UK only, 2006-2010 (MMO)

5.3.1 Under-10 metre Fleet

The under-10 metre fishing fleet has not, as yet, been subject to the same levels of restrictions upon their activities as the over-10 metre sector. They are now however also subject to sea area and quota restrictions for certain species mainly as part of the 'Cod Recovery Programme', implemented to restrict landings of cod and promote recovery of the species.

Table 5-1 below shows the under-10 metre quota allocations for the past three years.

Table 5-1 Under-10 metre Final Quota Allocations (Source: MMO²)

Species	2007 Quota (Tonnes)	2008 Quota (Tonnes)	2009 Quota (Tonnes)	2010 Quota (Tonnes)
North Sea Nephrops	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

Catch limits for nephrops were introduced in 1999 for the under-10 m fleet in order to maintain the integrity of recorded landings and quota management of this stock. Vessel owners are required to complete the NEP1 form in respect of all landings over 12 kg to be submitted to the Fishery Office³ on a weekly basis (Regulation: Category A (10 metre and under) License: Conditions (91) Non Sector).

5.4 Effort (Days at Sea) Restrictions

Over-10 metre vessels are currently also subject to days at sea limitations as part of the EC's policy of reducing fishing effort in EU waters (one of the foundations of the CFP). The regulation (Annex V, EU Regulation 2287/2003) is somewhat complex and relates to gear type, mesh size and elected management periods (i.e. the period of time that a management policy of a particular area applies). In essence, the measures included within the regulation effectively restrict vessels using demersal whitefish gears to the equivalent of 14-15 days a month at sea.

5.5 Shellfish Entitlements

Since 2004 vessels must also be specifically licensed to catch crabs and lobsters. Under these arrangements, shellfish entitlements allowing unrestricted amounts of crabs and lobsters to continue to be caught were issued to owners of licensed vessels that had 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). It is a condition of vessels of 10 metre and under with shellfish entitlement to submit weekly log sheets for crab and lobster landings to the Fishery Office.

5.6 Regional and Local Fishing Restrictions

Restrictions upon fishing activities in addition to those transposed from EU and UK law are known as Scottish Statutory Instruments (SIs). SIs are a form of secondary legislation in Scotland, created by the Scotland Act 1998 and used to exercise devolved powers. There are several SIs in the regional study area, shown in Figure 5.3, and contained within the Inshore Fishing (Prohibition of Fishing and Fishing Methods) (Scotland) Order 2004, No.276 SI.

The restriction in St Andrews Bay applies to the area inshore of the line drawn between Buddon Ness and Fife Ness. All use of mobile and active gear is prohibited all year, although potting is acceptable.

² <http://www.marinemanagement.org.uk/fisheries/management/quotas.htm>

³ Day to day management of fishing activities is the responsibility of regional Fishery Officer within a defined district

The restriction in the Firth of Forth applies to the area inshore of the line drawn between Fife Ness Lighthouse and North Ness on the Isle of May, along the coast of the Isle of May to South Ness and on to the mainland at Tantallon Castle. Vessels operating demersal gear with a length of over 16.77 m are prohibited from fishing entirely. Any category of vessel fishing pelagic (mid water) species is permitted.

The restriction in the St Abbs to Eyemouth area applies to the area of water within one mile of the mean high water (MHW) mark of ordinary spring tides on the mainland coast, bounded by a line drawn from St Abbs Head and from the Scottish/English border. The use of mobile or active gear is prohibited year round.

All mobile gear is prohibited in the area of water within two miles of the MHW from Lang Craig to Arbroath. Between Doolie Ness and Lang Craig, all mobile gear is prohibited between 1st October and 31st March each year within one mile and the MHW, and between 1st April and 30th September within one half mile and the MHW. The use of mobile gear is prohibited all year in the area of water within two miles of the MHW, bounded by a line drawn from Mons Craig to Doolie Ness.

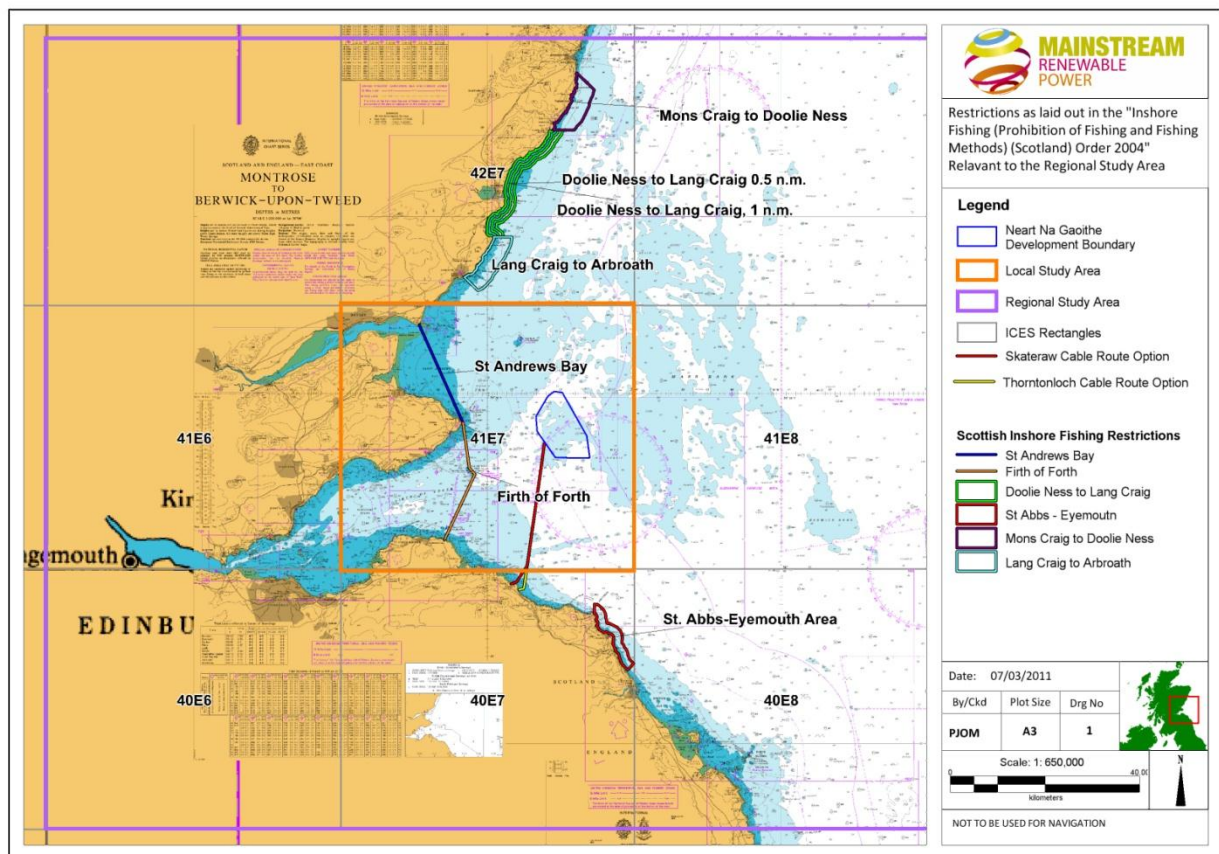


Figure 5.3 SI Restrictions upon Inshore Fishing Activities relevant to the Regional Study Area

5.7 Scallop Dredging Restrictions

Scallop dredging vessels are restricted by the number of dredges they can use, depending upon the distance they are operating from the coast. Vessels fishing outside 12 NM are allowed up to 14 dredges per side; within 6 and 12 NM up to 10 dredges aside are permitted; and up to 8 dredges inside 6 NM.

6.0 MMO Fisheries Statistics

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 900 NM² in open sea areas) relative to the proposed development and 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. Subsequent sections of this report identify further fishing grounds within these areas.

6.1 Landings Values

6.1.1 National Overview

Figure 6.1 and Figure 6.2 show the total landings values (average 2000-2009) by species and method, respectively. It can be seen that the ICES rectangle within which the proposed development is situated (41E7) contains fishing grounds that are of relative importance on a national (Scottish) scale. Total landings values are the highest recorded in rectangles in the east of Scotland, and are comparable to rectangles on the west coast.

Nephrops constitute the highest landings values by an individual species in 41E7, and it can be seen that other productive nephrops grounds are located in the west of Scotland and in offshore waters in the north-east. Nephrops are primarily fished for by demersal otter trawls. In the data set provided by the MMO, these vessels are variously listed as demersal otter trawls and nephrops trawls (the same category of vessel), as well as by twin rigs (demersal otter trawls configured to tow two nets). Static gear vessels operating pots also target the species in inshore waters, although with much lower recorded levels of landings. Figure 6.3 overleaf shows recorded levels of landings by value on a national scale. It can be seen that the proposed development is situated in the vicinity of nationally important nephrops grounds.

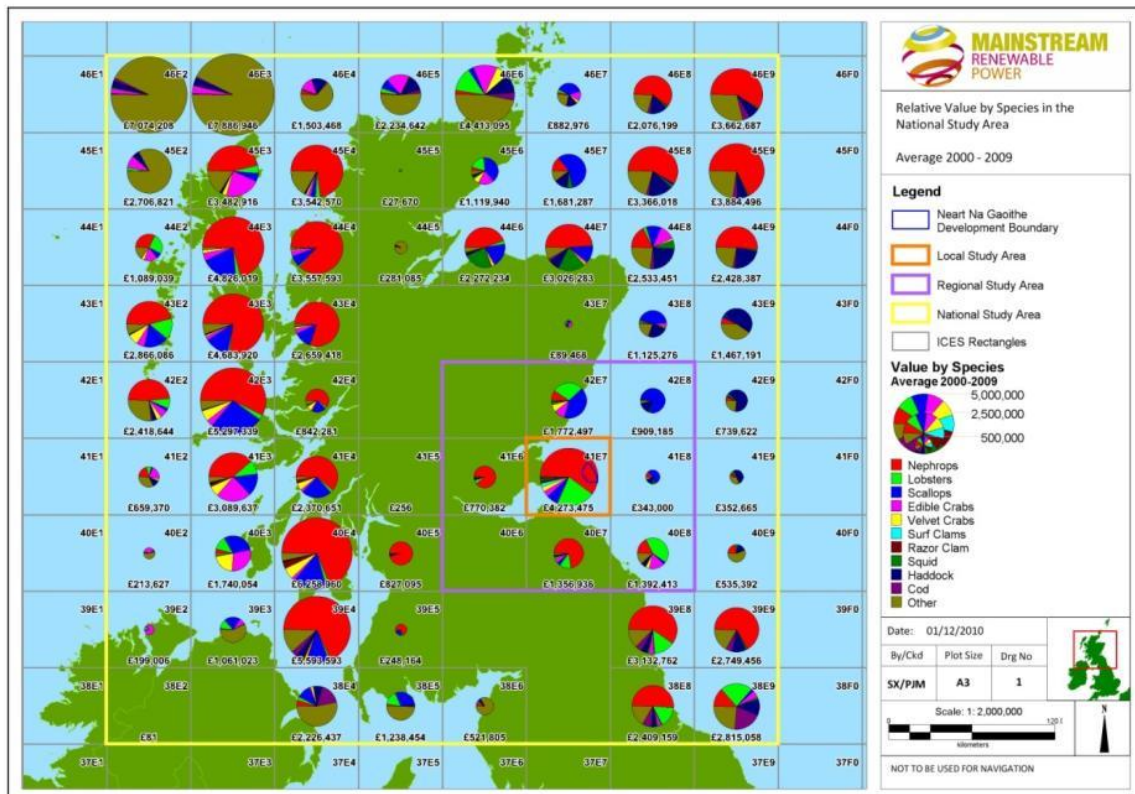


Figure 6.1 Landings Values by Species (Average 2000-2009) in the National Study Area

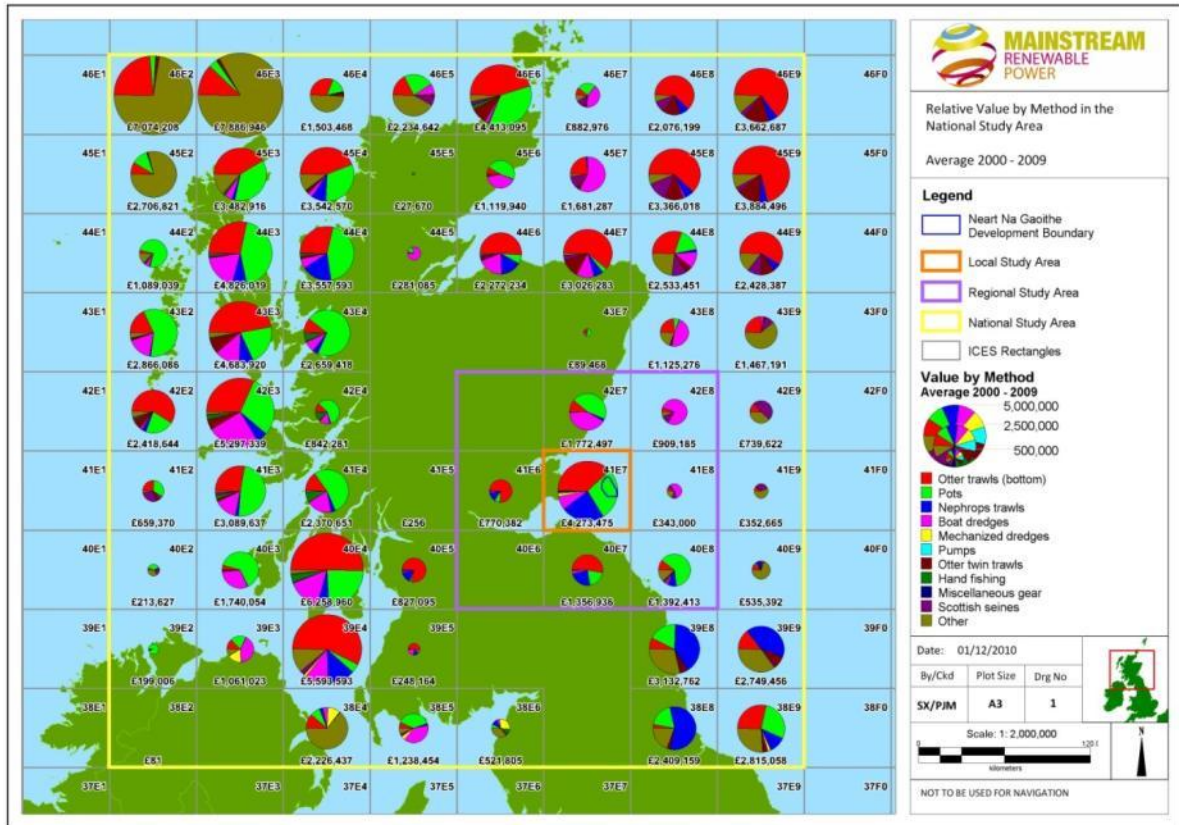


Figure 6.2 Landings Values by Method (Average 2000-2009) in the National Study Area

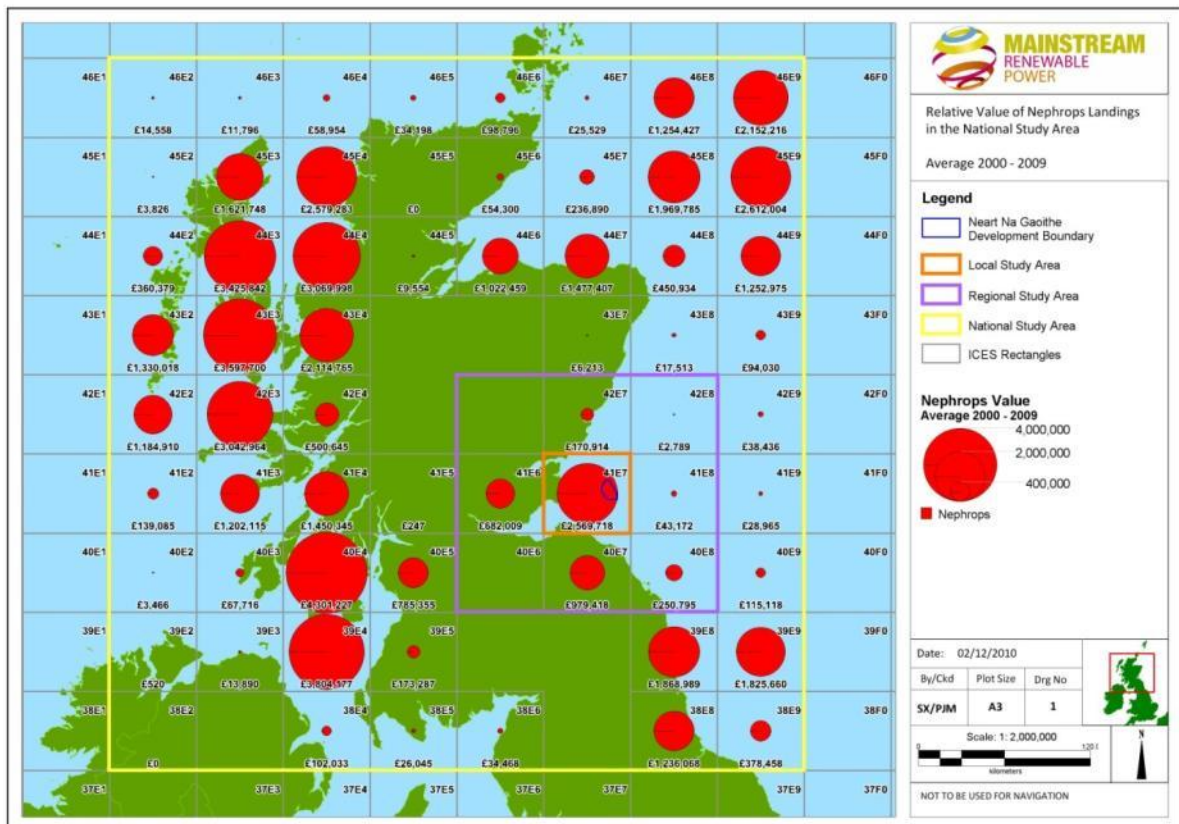


Figure 6.3 Landings Values of Nephrops (Average 2000-2009) in the National Study Area

6.1.2 Regional Study Area

Figure 6.4 and Figure 6.5 show the landings values recorded in the ICES rectangles in the regional study area. It can be seen that rectangle 41E7 records the highest landings, an average of £4,273,475 for the ten year period, nearly two and a half times that of the second highest value rectangle to the north. Figure 6.6 shows that the majority of landings recorded by the under-10 metre and 10-15 metre categories of vessel.

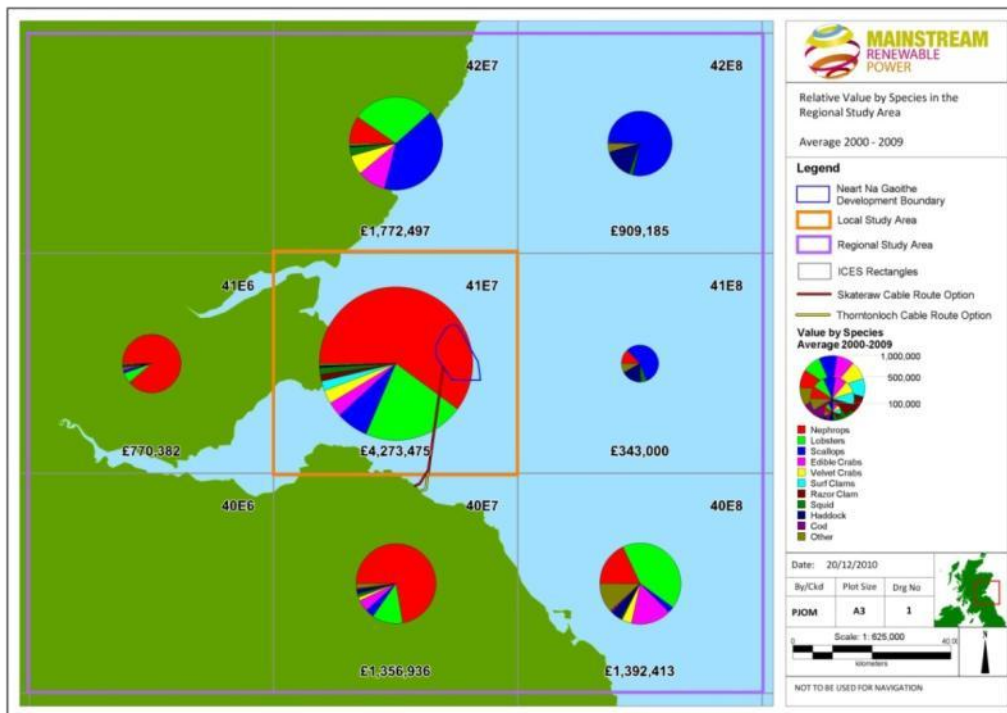


Figure 6.4 Landings Values by Species (Average 2000-2009) in the Regional Study Area

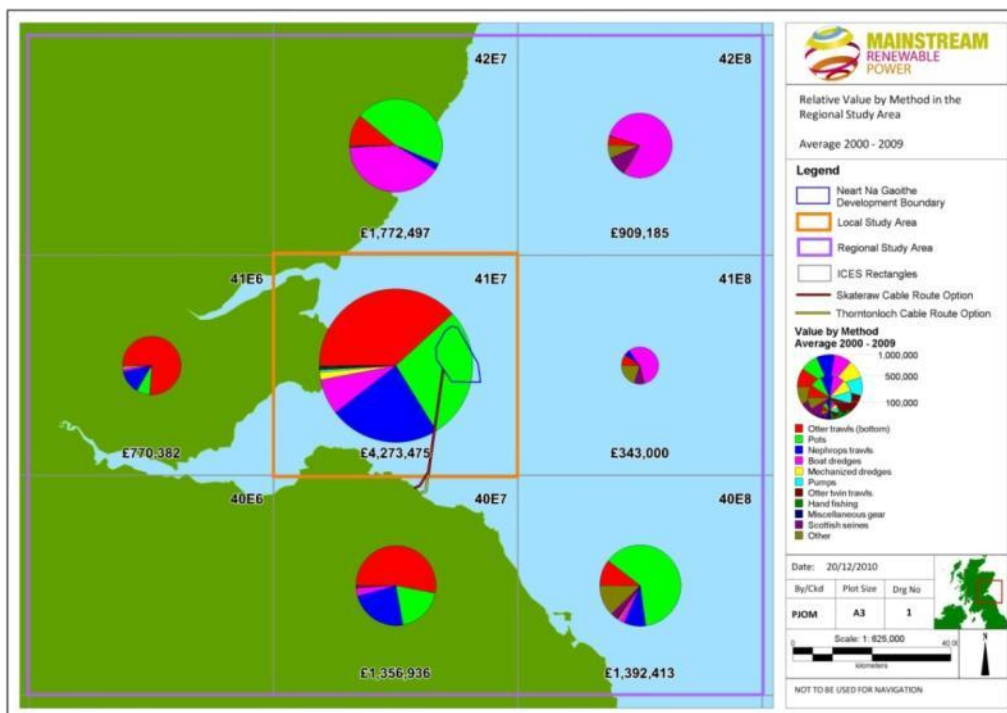


Figure 6.5 Landings Values by Method (Average 2000-2009) in the Regional Study Area

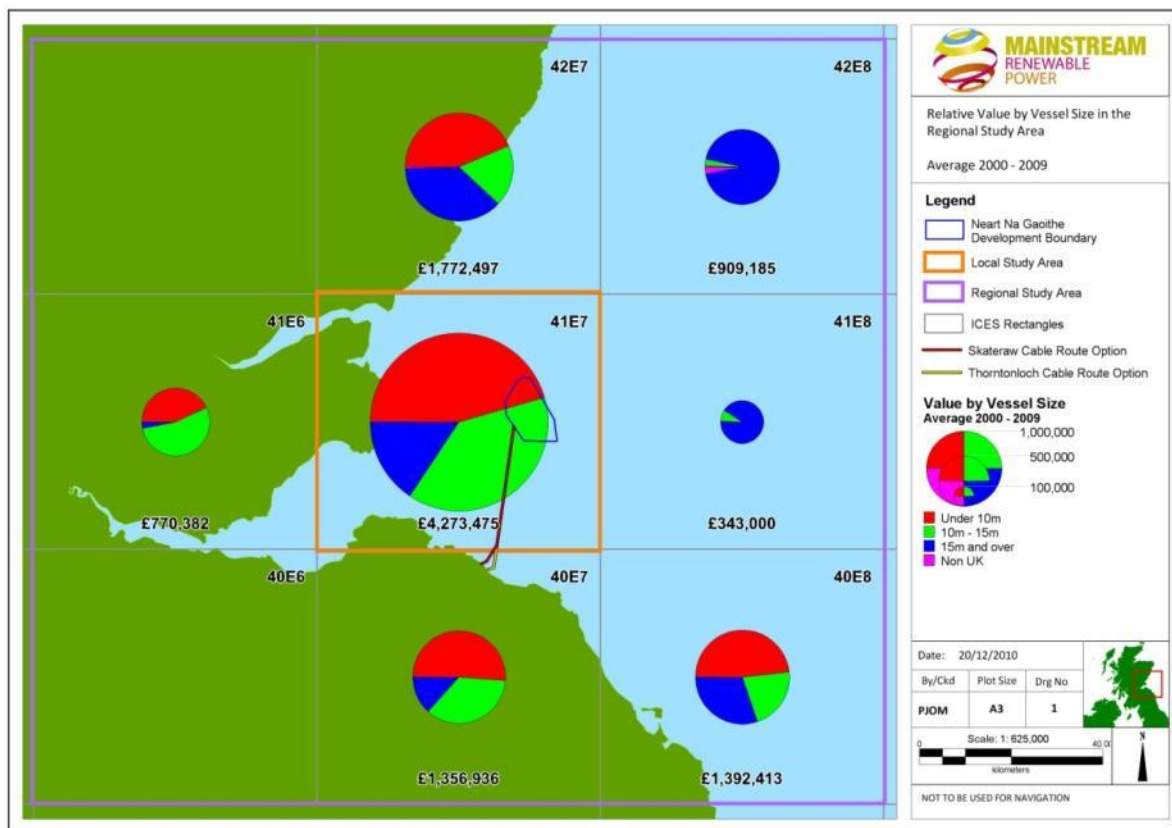


Figure 6.6 Landings Values by Vessel Length (Average 2000-2009) in the Regional Study Area

6.1.3 Local Study Area (ICES Rectangle 41E7)

Figure 6.7 indicates that nephrops constitute the highest landings values in the study area (60%). Lobsters, edible and velvet crab make up 27%, and King scallops a further 7%. The remaining species, including surf and razor clams, squid, and whitefish such as haddock and cod make up the remainder (6%).

Figure 6.8 shows that bottom otter trawls and nephrops trawls (the same vessel type but categorisation is sometimes different) are the principal methods targeting nephrops. Twin rig otter trawls and pots also account for a low level of landings values. Crustacea such as lobsters, edible and velvet crabs are targeted by pots/creels. King scallops are targeted by boat dredges. Surf and razor clams are primarily targeted using boat and mechanised dredges and pumps, although a proportion of surf clams are landed using pots, and a proportion of razor clams are hand raked. Squid is targeted by demersal trawl vessels.

Figure 6.9 indicates that the majority (57%) of trawl vessels targeting nephrops are between 10-15 m in length, although 28% are under-10 metres and 15% over-15 metres. The large majority of crab and lobster landings are by the under-10 metre fleet, and the majority of scallop dredging vessels are over-15 m. Vessels operating mechanised (hydraulic) dredges and pumps, used to target razor and surf clams are for the most part under-10 metres in length.

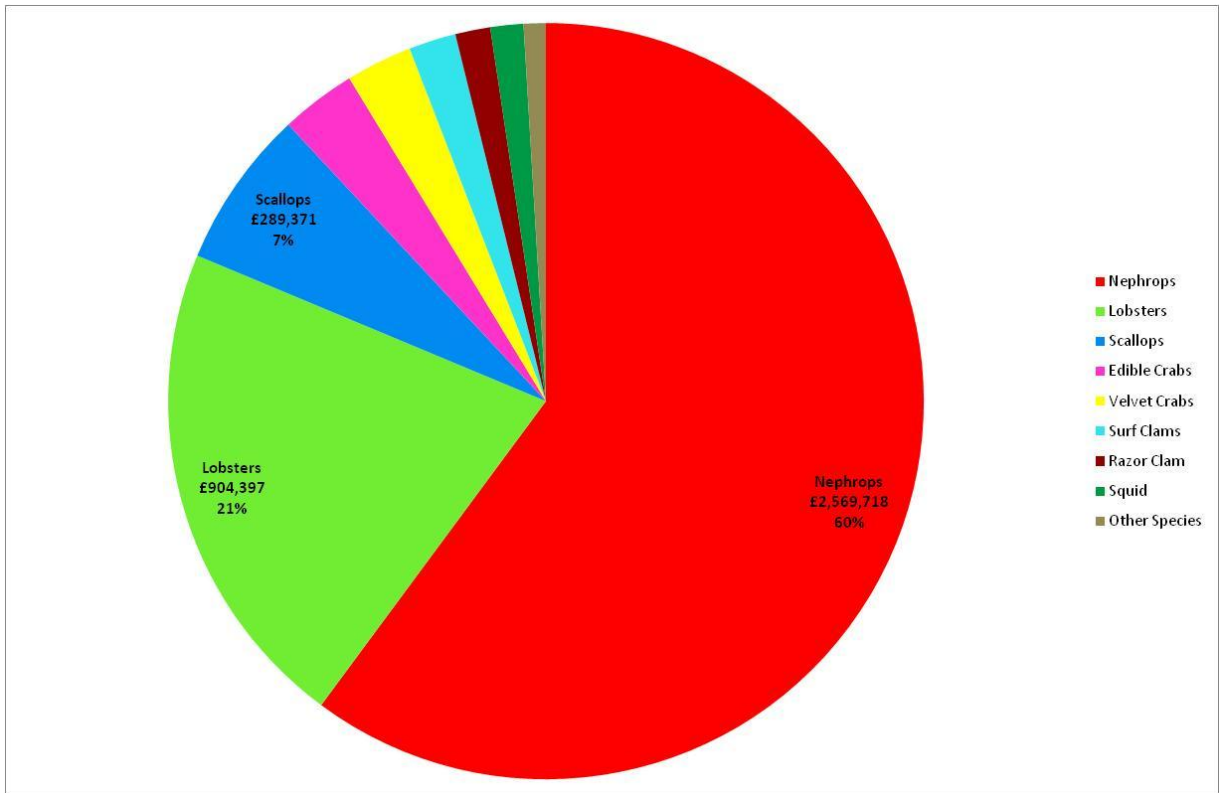


Figure 6.7 Percentage Distribution of Landings Values by Species in ICES Rectangle 41E7

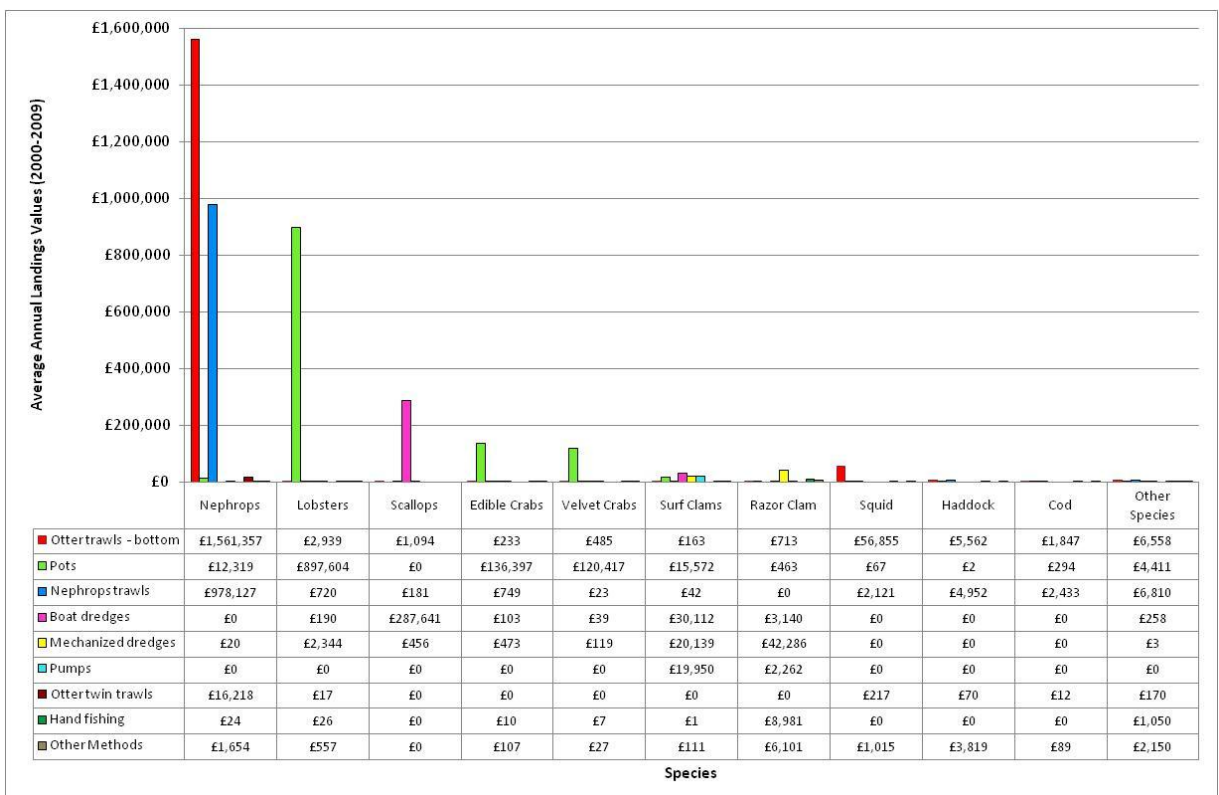


Figure 6.8 Average Annual Landings Values (2000-2009) by Species and Methods in the ICES Rectangle 41E7

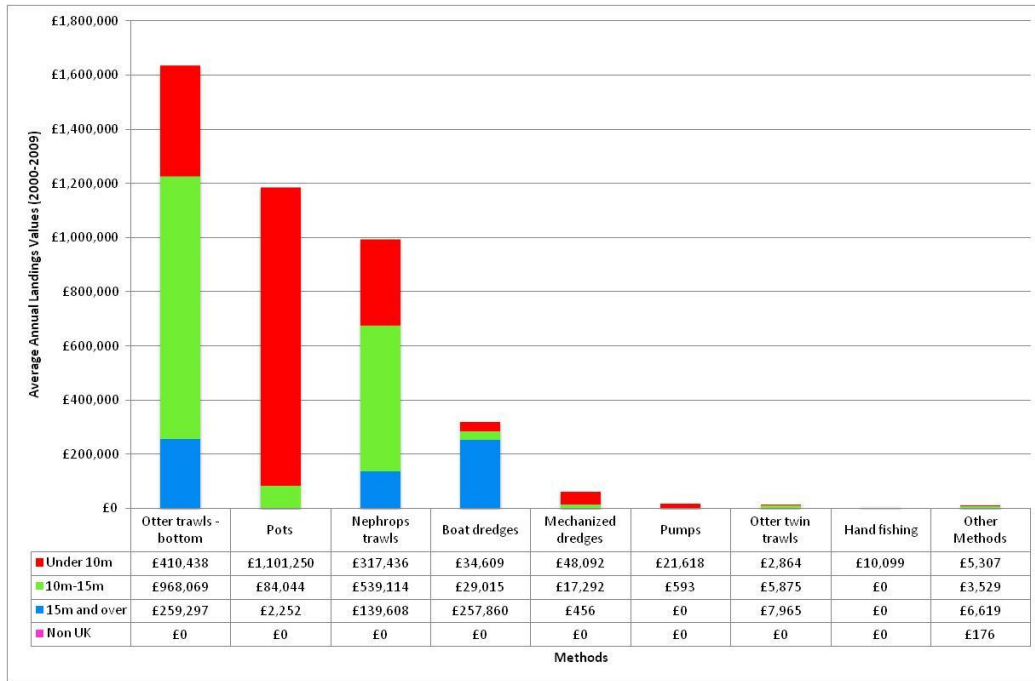


Figure 6.9 Average Annual Landings Values (2000-2009) by Methods and Vessel Length in the ICES Rectangle 41E7

6.2 Annual Landings

Figure 6.10 shows the annual variations in landings values by species. Since 2004, landings values for the majority of commercial species have increased. It appears that a fishery for surf clams was established in 2002 and a new fishery for razor clams was established in 2005. Landings of velvet swimming crab have shown an increase in landings values from £12,508 in 2000 to £245,587 in 2008. Squid landings show low landings values before 2004. Since then the squid fishery has seen substantial variations in values, from £6,594 in 2009 to £359,576 in 2007.

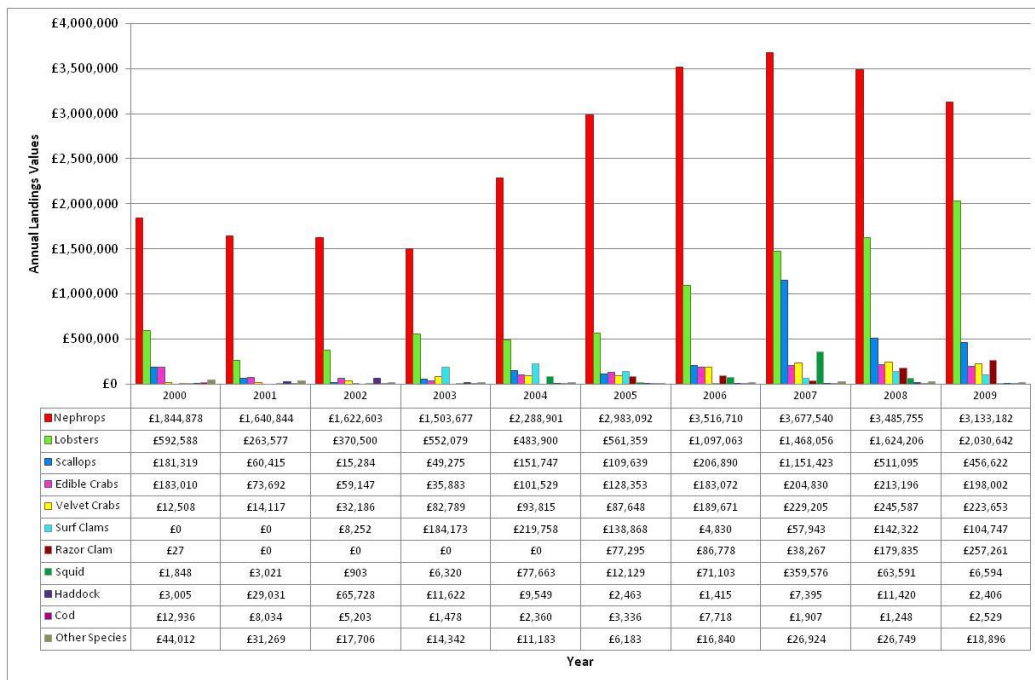


Figure 6.10 Annual Variations in Landings Values of Species in the ICES Rectangle 41E7

Annual variations for the top three species are separately analysed in Figure 6.11 to Figure 6.13. Figure 6.11 shows that overall landings of nephrops have increased over the period, although they declined slightly in 2008 and 2009. Landings for lobster (Figure 6.12) show a pattern of significantly increased landings values since 2006, likely as a result of regulations introduced to record landings for the under-10 metre fleet. Scallops values (Figure 6.13) vary significantly throughout the period, with a low of £15,284 in 2002 and a high of £1,151,423 in 2007.

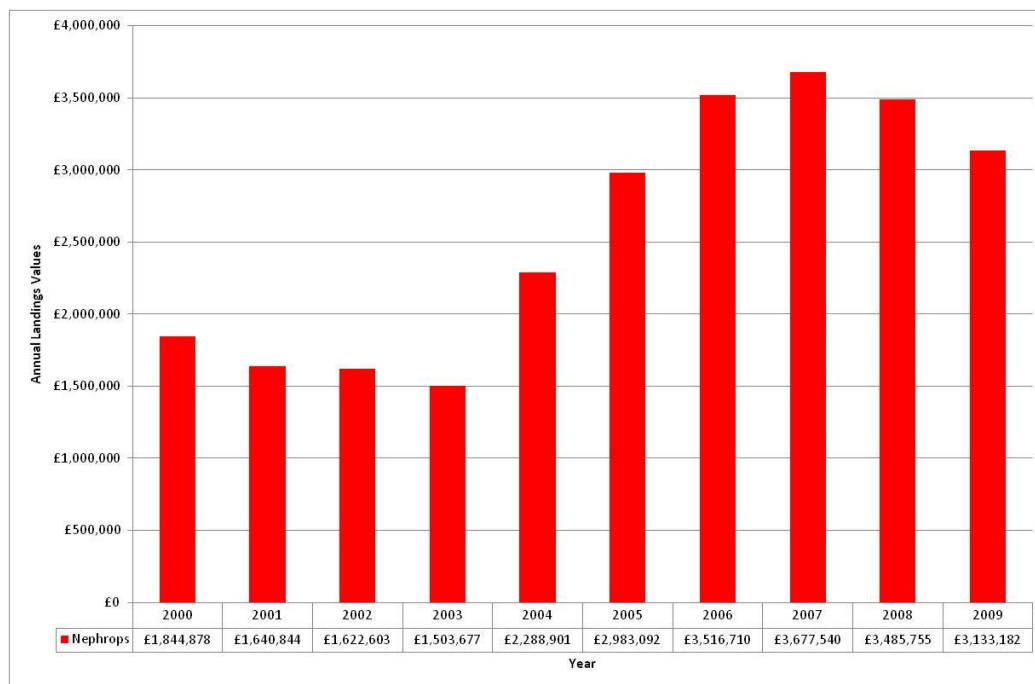


Figure 6.11 Annual Variations in Landings Values of Nephrops in the ICES Rectangle 41E7

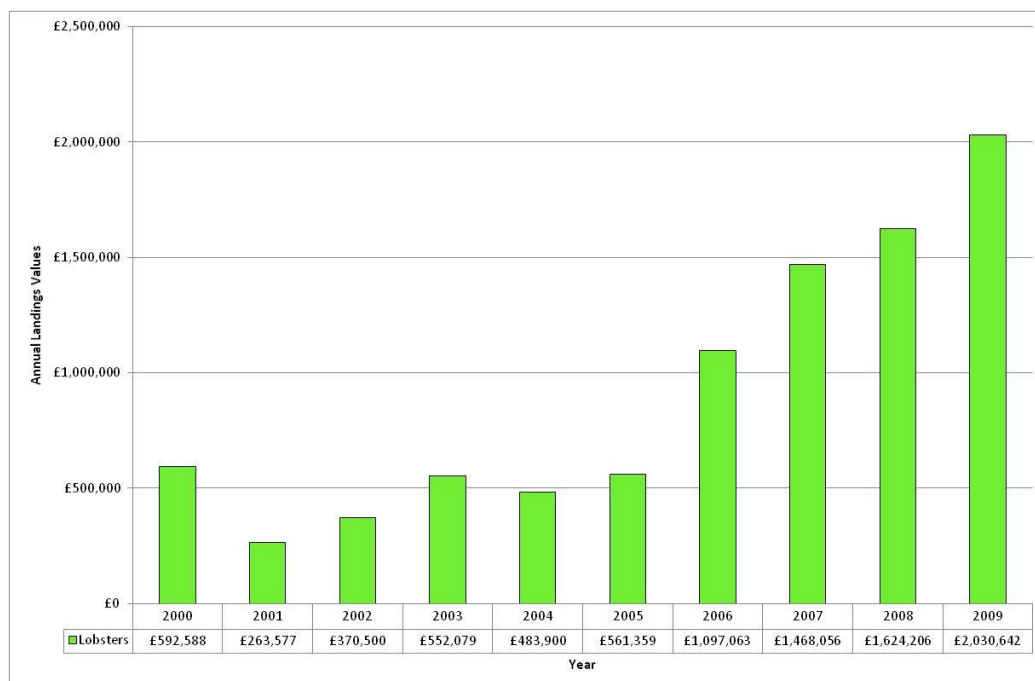


Figure 6.12 Annual Variations in Landings Values of Lobsters in the ICES Rectangle 41E7

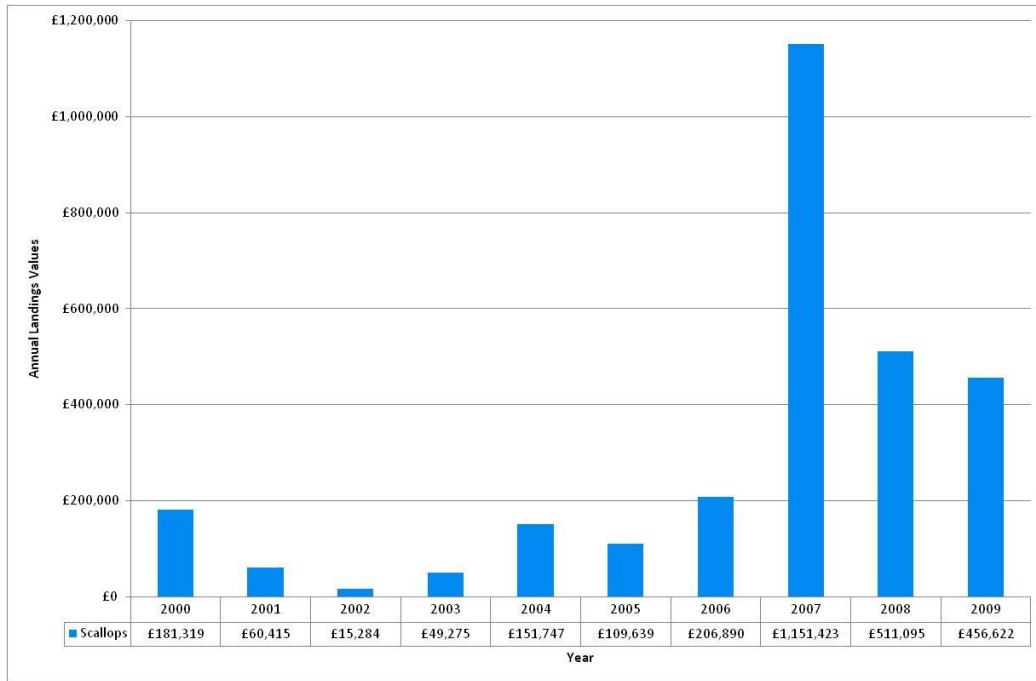


Figure 6.13 Annual Variations in the Value of Scallop Landings in the ICES Rectangle 41E7

6.3 Seasonality

Figure 6.14 indicates the seasonal trend of landings for all species in ICES Rectangle 41E7. It can be seen that total landings are broadly highest in the summer months, between June and October. There are also, however, moderate catch values recorded between November and January. The lowest total catch rates are during May.

Figure 6.15 to Figure 6.17 show the seasonal variations in landings values for the top three species in ICES Rectangle 41E7.

Figure 6.15 demonstrates that nephrops landings are recorded throughout the year, with a peak in the summer months of July and August, and catch values remaining at relatively high levels through the winter months until January.

Figure 6.16 demonstrates the average seasonality of lobsters. The highest landings values are during the summer months (July, August and September) with values for the rest of the year being comparatively lower.

Figure 6.17 illustrates that scallop landings values show significant seasonal variation during the year. Very low levels are recorded in the winter months, with values rising from March and peaking between June and September, after which levels drop sharply.

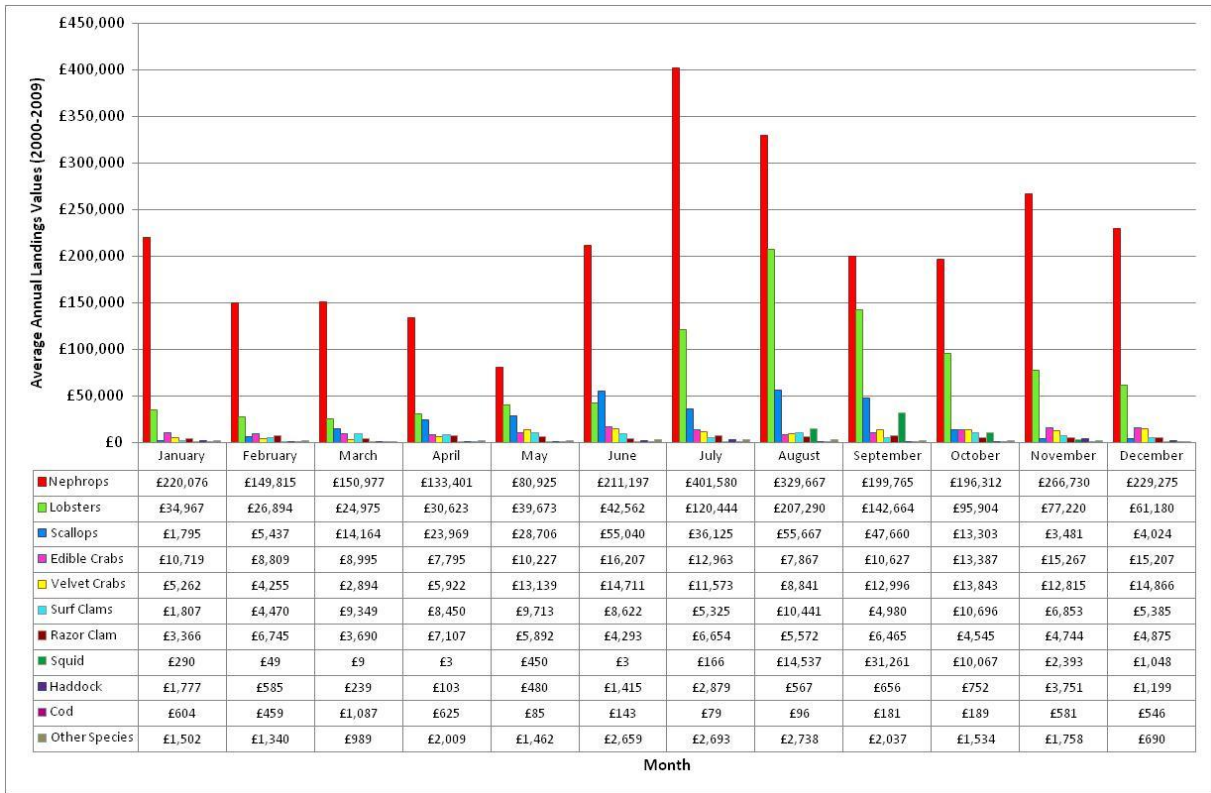


Figure 6.14 Average Annual (2000-2009) Seasonality of Species in the ICES Rectangle 41E7

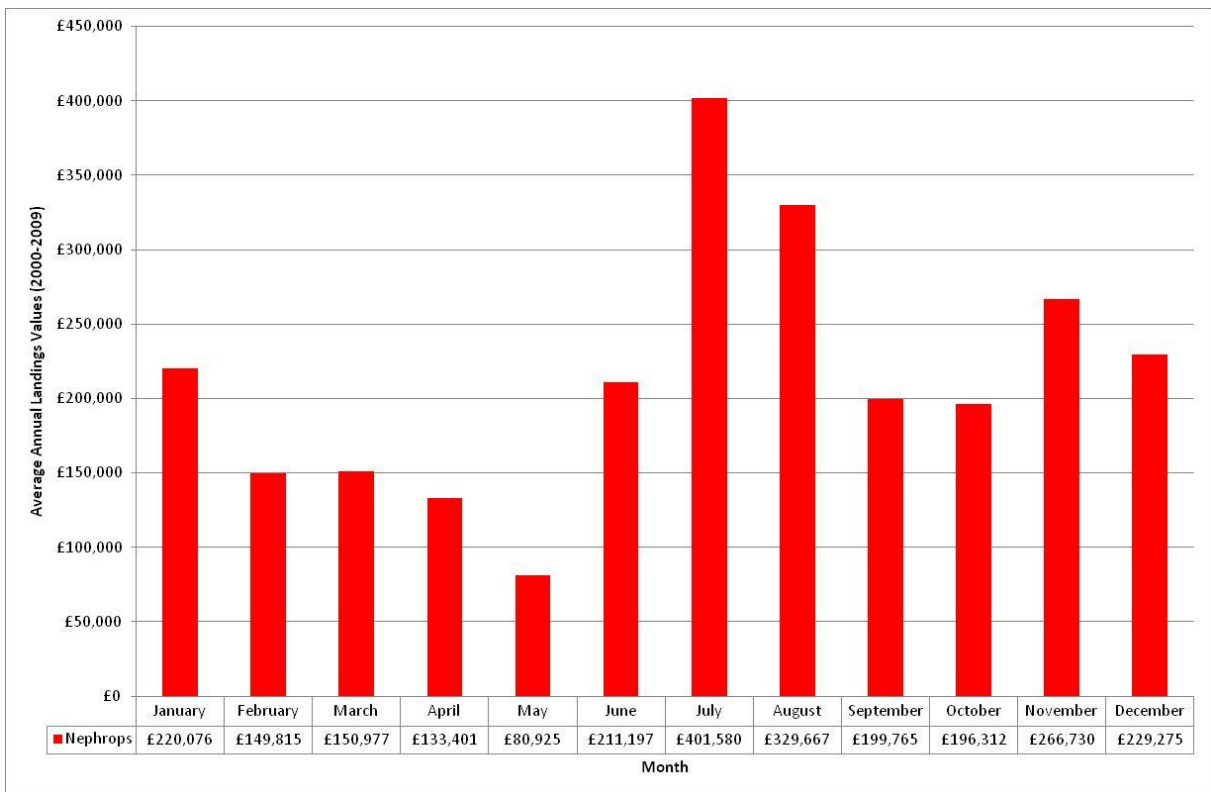


Figure 6.15 Average Annual (2000-2009) Seasonality of Nephrops in the ICES Rectangle 41E7

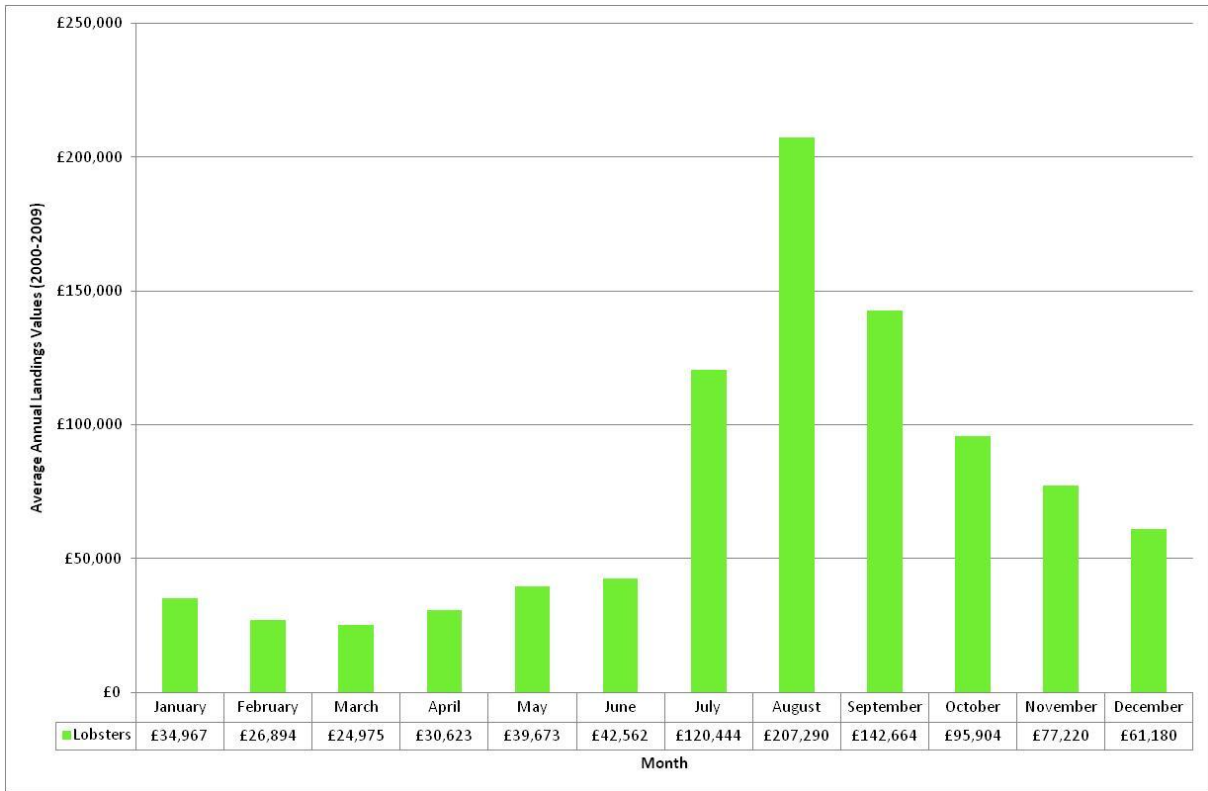


Figure 6.16 Average Annual (2000-2009) Seasonality of Lobsters in the ICES Rectangle 41E7

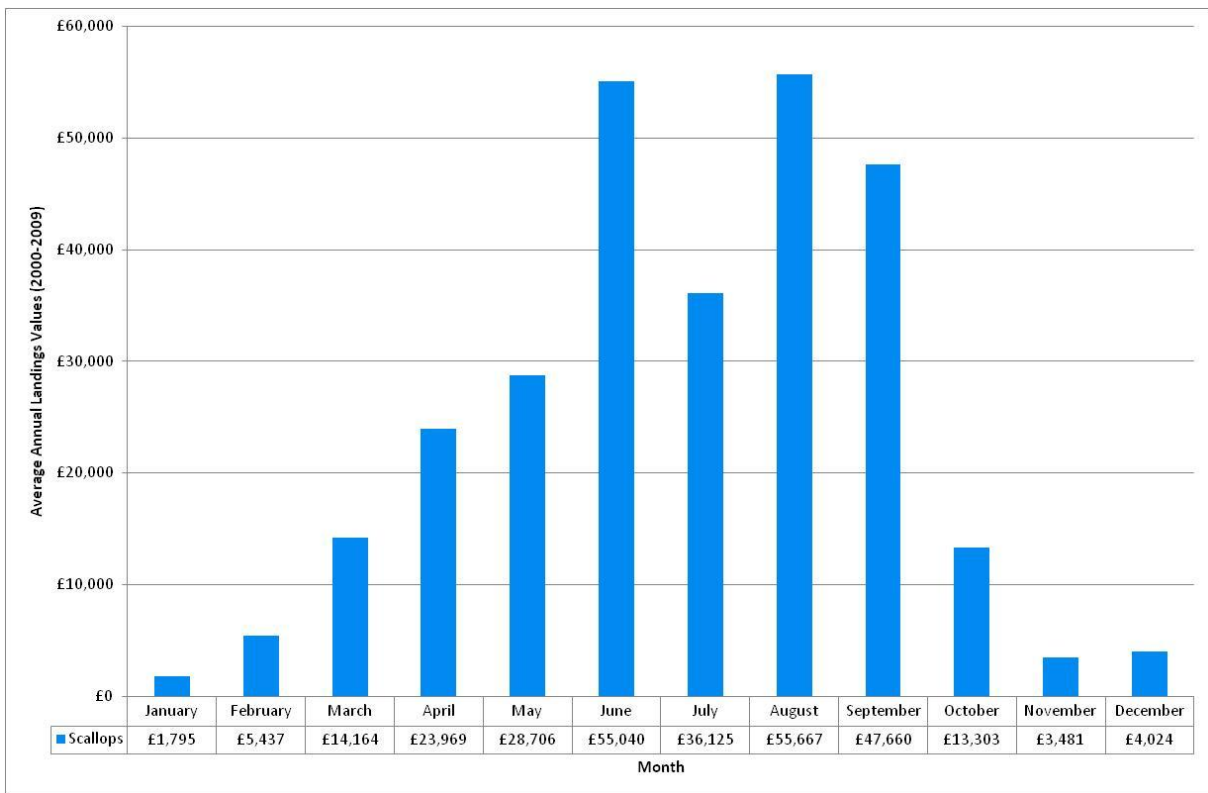


Figure 6.17 Average Annual (2000-2009) Seasonality of Scallops in the ICES Rectangle 41E7

6.4 Landings Values by Port

Table 6-1 shows the top 20 ports in the area by landings values within the local area, and the percentage of the ports' total income it represents. Percentages have been rounded to the nearest one decimal place. It can be seen that Pittenweem is the principal port, with 53.3% of the landings made in 41E7, representing 95.6% of its total income. Dunbar is also an important port for the landings of the local area, recording 12.4% of landings in this rectangle and representing 85.8% of Dunbar's total value. Although small ports such as Crail, Methil and Leven, Anstruther, St. Andrews and West Wemyss represent only small proportions of the landings values from the local area, this makes up more than 95% of their total annual port value.

Table 6-1 Top 20 Ports by Annual Average Value from the ICES Rectangle 41E7

Port	Annual Average Landings Values (£) in the Local Study Area (2000-2009)	% of Annual Value in the Local Study Area	Total Average Annual Port Value (2000-2009)	% of Total Annual Port Value that the Local Study Area represents
Pittenweem	£2,277,100	53.3%	£2,381,495	95.6%
Dunbar	£530,224	12.4%	£617,770	85.8%
Eyemouth	£266,259	6.2%	£3,633,178	7.3%
Crail	£239,475	5.6%	£240,662	99.5%
Methil and Leven	£217,272	5.1%	£227,279	95.6%
Aberdeen	£160,560	3.8%	£12,482,442	1.3%
Anstruther	£118,591	2.8%	£119,453	99.3%
St Andrews	£106,460	2.5%	£107,692	98.9%
Arbroath	£65,623	1.5%	£839,533	7.8%
Granton	£39,027	0.9%	£56,891	68.6%
North Berwick	£36,962	0.9%	£42,930	86.1%
Port Seton	£33,360	0.8%	£728,795	4.6%
Montrose	£33,255	0.8%	£233,401	14.2%
Cove (Leith)	£30,754	0.7%	£58,281	52.8%
Burrtisland	£27,086	0.6%	£38,789	69.8%
St Monance	£25,469	0.6%	£38,873	65.5%
Peterhead	£19,876	0.5%	£85,703,602	0.0%
Newhaven	£10,370	0.2%	£19,510	53.2%
Fraserburgh	£10,355	0.2%	£40,502,160	0.0%
West Wemyss	£4,610	0.1%	£4,610	100.0%

Figure 6.18 overleaf shows the location of the top 20 ports recording landings from ICES rectangle 41E7. It can be seen that in the main, ports are very local to the area, which confirms that vessels operating in this area are largely based at local ports.

6.5 Effort (Days at Sea)

6.5.1 Regional Study Area

Figure 6.19 below shows the average annual seasonality (2000-2009) by effort (days fished) in the regional study area. It can be seen from the total effort recorded in ICES rectangle 41E7 that two thirds of effort is attributed to otter and nephrops trawls, and a third is recorded for potting. Figure 6.20 shows that the large majority of effort is recorded by vessels in the under 10 metre and 10-15 metre length categories. As is the case with landings values, ICES rectangle 41E7 records the highest effort levels in the regional study area.

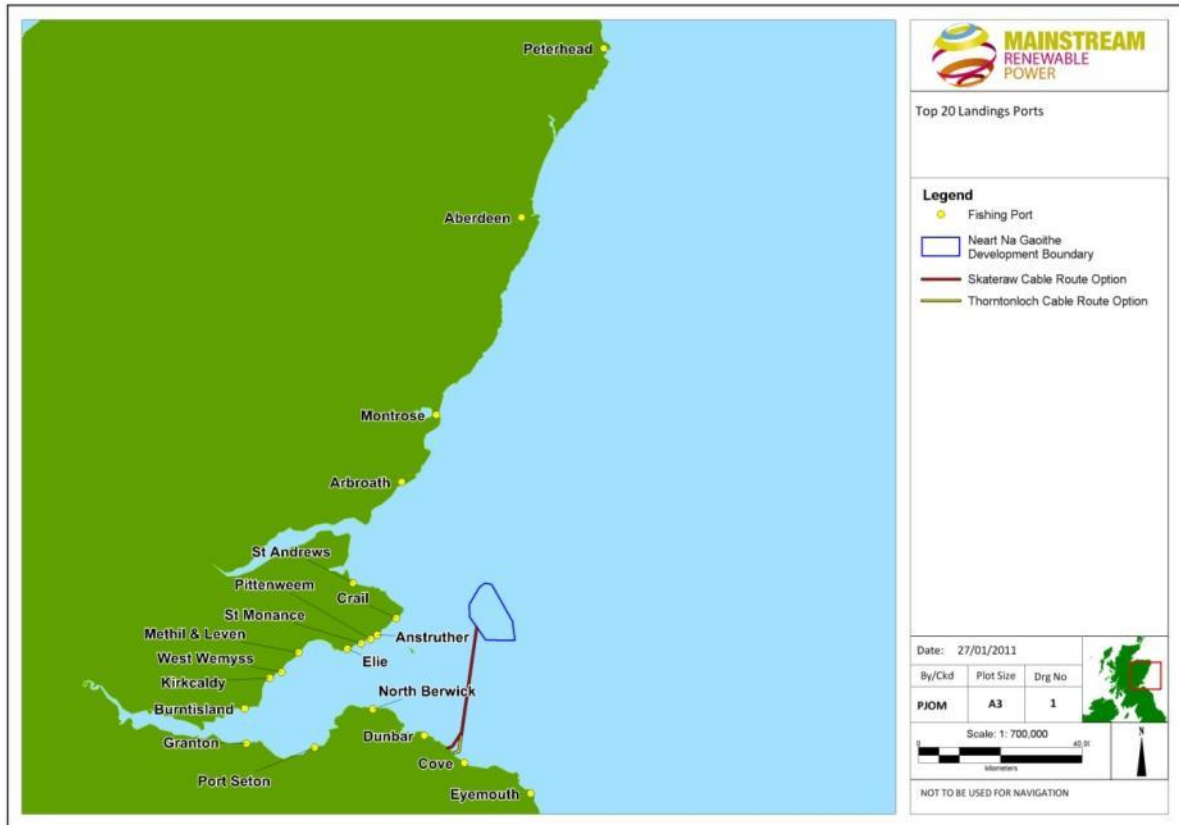


Figure 6.18 Top Twenty Ports recording Landings from ICES Rectangle 41E7

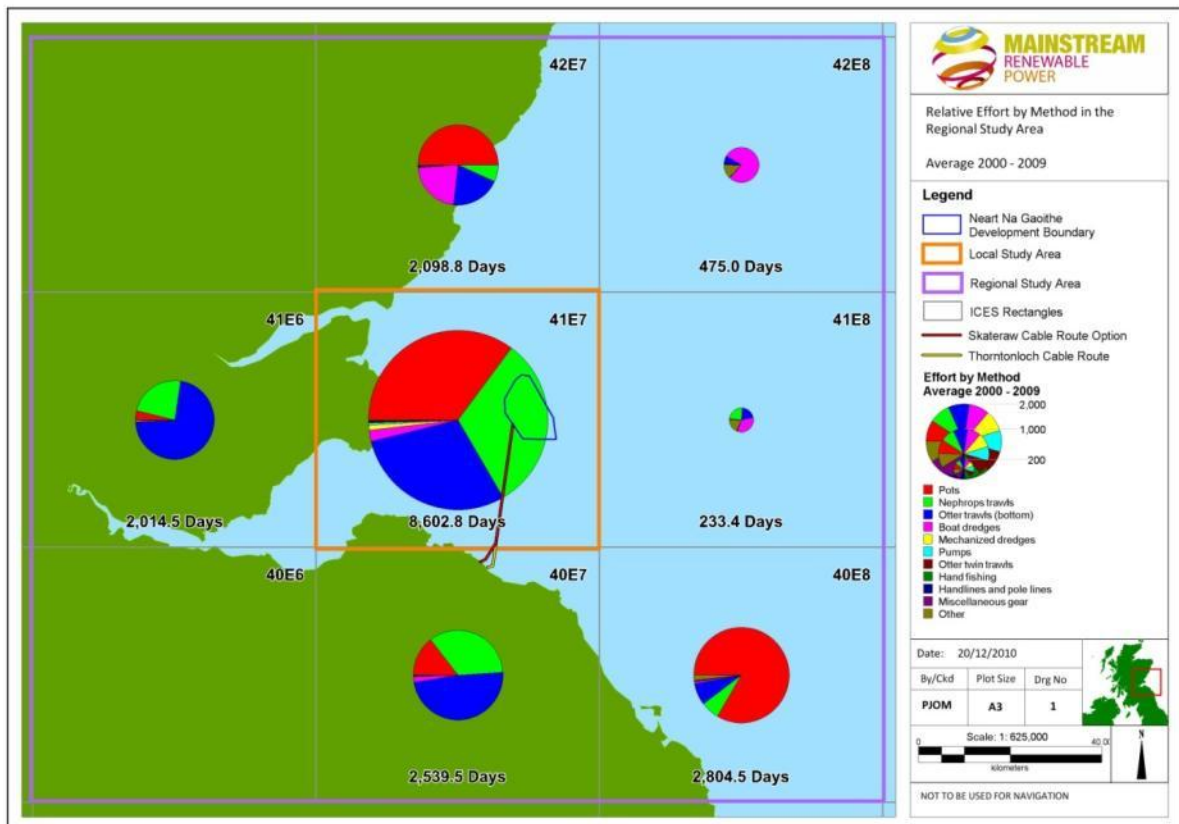


Figure 6.19 Effort (Days at Sea) by Fishing Method in the Regional Study Area (average 2000-2009)

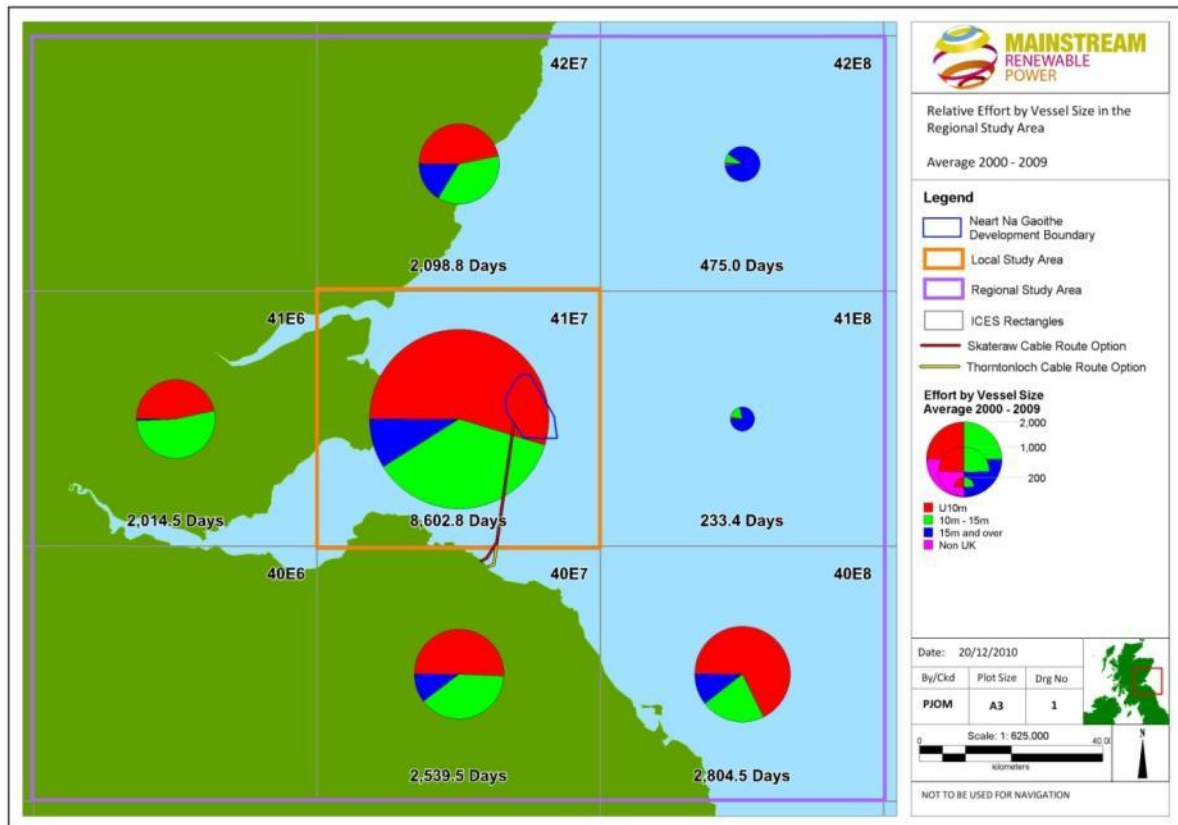


Figure 6.20 Effort (Days at Sea) by Vessel Length in the Regional Study Area (average 2000-2009)

6.5.2 Local Study Area (41E7)

Figure 6.21 shows the annual variation in effort in 41E7. The effort for the 10 m to 15 m vessels stays reasonably steady with a slight decrease in 2003. A similar pattern is seen for the 15 m and over vessels. Effort for the under-10 m vessels increases significantly in 2006, from 3325 days to 7646 days in 2007, and remains at this level until 2009. This is likely as a result of regulations introduced to record landings for the under-10 metre fleet and not a true representation in increasing levels in activity for this category of vessel.

Figure 6.22 shows the average annual seasonality by effort (days fished) in the local area. As seen with the seasonality of landings values, fisheries in 41E7 peak in the summer months but remain at high levels for a longer period (June to October and into November). When analysed using landings values, there was seen to be a drop in value in May, which is reflected in the decreased effort by the over-10 m and over-15 m sector for this period but not shown in the effort data for the under-10 metre fleet.

Table 6-2 overleaf shows the averaged annual effort for the top 20 ports in rectangle 41E7, and the percentage of the port's total effort it represents. The patterns are broadly commensurate with those described above for the values by port: Pittenweem is the principal port in terms of percentage of total effort and it records the majority of its activity in the rectangle, and smaller local ports register almost the entirety of their activity within the rectangle. Table 6-3 shows the effort made by each vessel category at each port over the last ten years. Again, patterns are commensurate with values data.

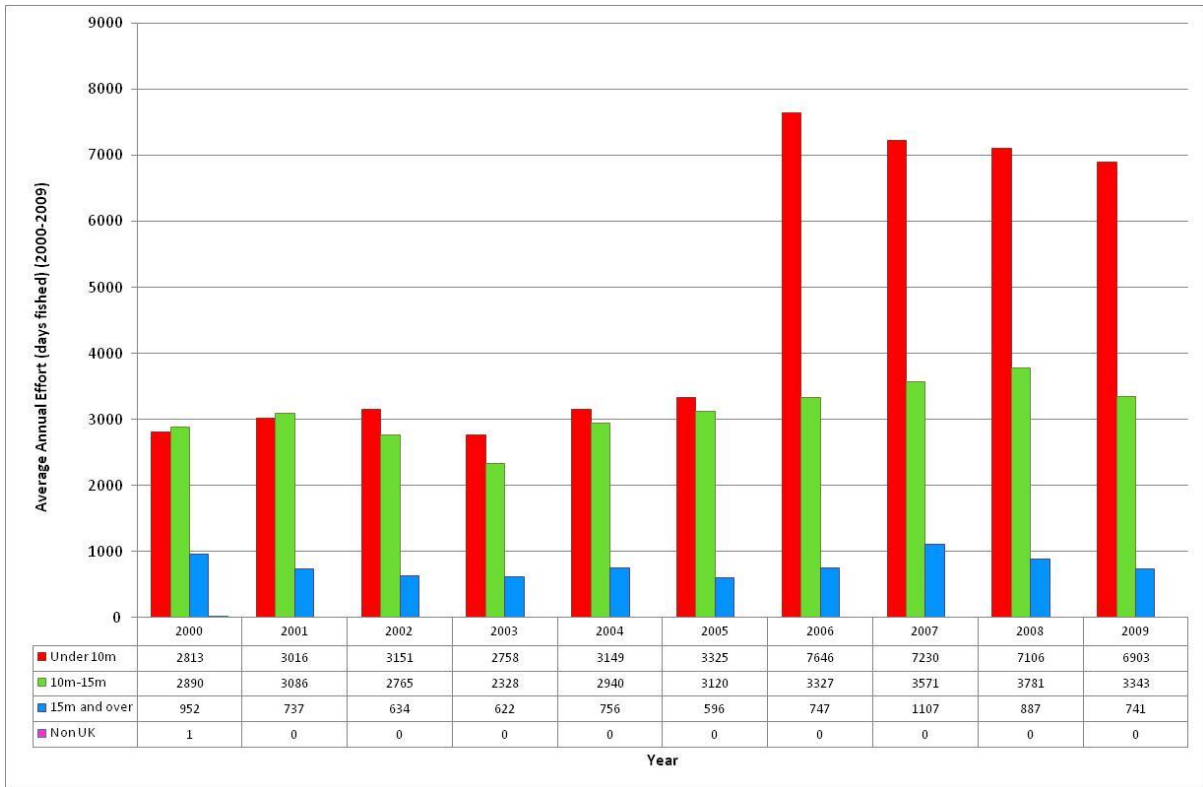


Figure 6.21 Annual Variations in Effort (days fished) in the ICES Rectangle 41E7

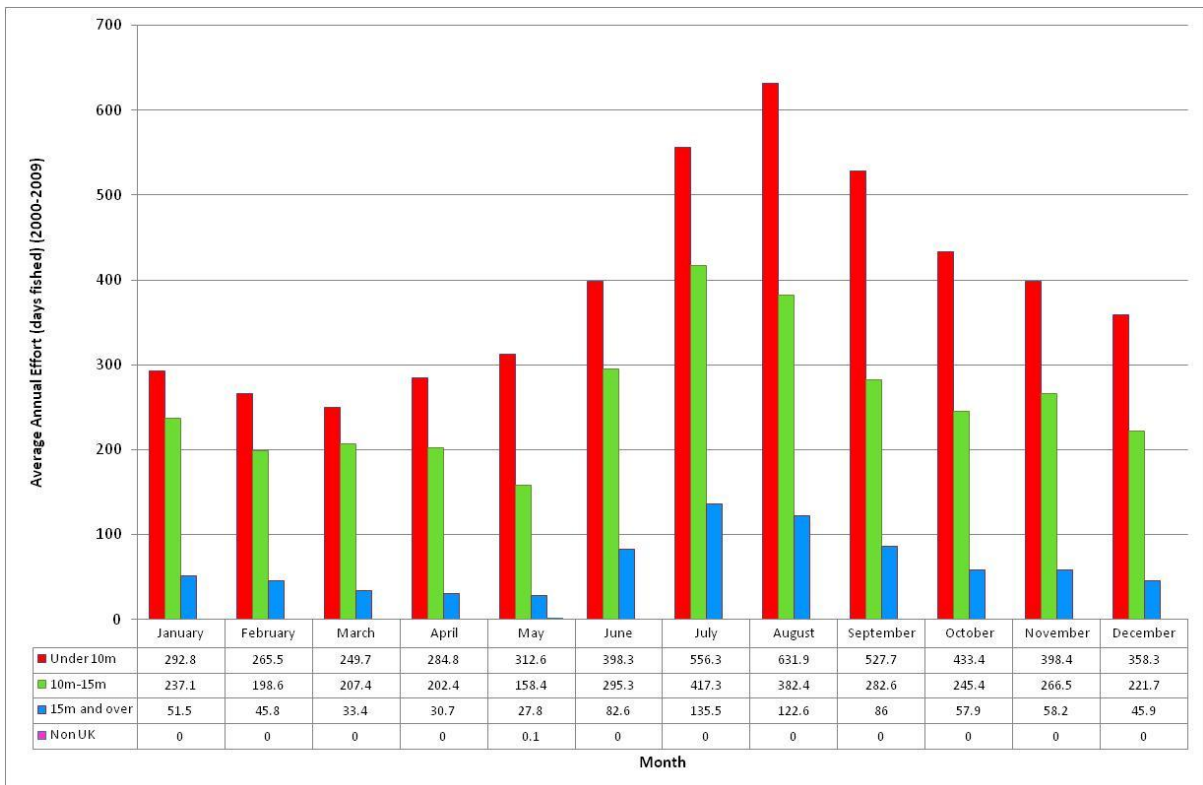


Figure 6.22 Average Annual (2000-2009) Seasonality by Effort (days fished) in the ICES Rectangle 41E7

Table 6-2 Top 20 Ports by Average Annual Effort (days fished) in the ICES Rectangle 41E7

Port	Average Annual Effort (days fished, 2000-2009) in the Local Study Area	% of Annual Effort in the Local Study Area	Total Average Annual Port Effort (days fished, 2000-2009)	% of Total Annual Port Effort that the Local Study Area represents
Pittenweem	4539.3	52.8%	4708.3	96.4%
Dunbar	959.6	11.2%	1179.5	81.4%
Crail	739.7	8.6%	742.6	99.6%
Methil and Leven	607.4	7.1%	620.6	97.9%
Anstruther	418.9	4.9%	420.9	99.5%
Eyemouth	379.2	4.4%	3861.6	9.8%
St Andrews	267.1	3.1%	268.6	99.4%
St Monance	150.7	1.8%	157.7	95.6%
Burntisland	98.4	1.1%	123.7	79.5%
North Berwick	79.3	0.9%	88.4	89.7%
Port Seton	74.9	0.9%	2011.6	3.7%
Aberdeen	68.4	0.8%	4983.1	1.4%
Arbroath	67.6	0.8%	999.9	6.8%
Granton	44.3	0.5%	57.2	77.4%
Cove	19.3	0.2%	71.7	26.9%
Montrose	12	0.1%	178	6.7%
West Wemyss	11.5	0.1%	11.5	100.0%
Elie	11.2	0.1%	11.2	100.0%
Kirkcaldy	11.2	0.1%	11.2	100.0%
Peterhead	10.1	0.1%	16129	0.1%

Table 6-3 Annual Effort (days fished) by Port and Vessel Length in the ICES Rectangle 41E7

Port and Vessel Length	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	10Yr Avg
15 m and over											
Pittenweem	795	485	402	403	526	496	567	506	405	385	497
Eyemouth	75	183	146	164	117	53	88	195	292	150	146.3
Aberdeen	17	7	19	4	27	21	62	239	96	121	61.3
Arbroath	27	22	38	11	16	15	8	27	40	33	23.7
Methil and Leven	22	26	19	36	34	0	0	0	0	0	13.7
Montrose	0	0	4	0	12	4	5	68	6	0	9.9
Peterhead	2	1	3	1	17	5	7	41	8	13	9.8
Fraserburgh	1	0	0	0	3	1	5	17	14	2	4.3
Dunbar	0	4	0	0	0	0	0	0	9	11	2.4
Port Seton	0	2	0	0	0	0	0	2	11	5	2
Other Ports	13	7	3	3	4	1	5	12	6	21	7.5
Total	952	737	634	622	756	596	747	1107	887	741	777.9
10 m-15 m											
Pittenweem	2149	2411	2121	1578	1962	1926	2067	2472	2430	2332	2144.8
Dunbar	365	372	363	375	397	496	676	527	610	633	481.4
Eyemouth	103	53	72	113	311	397	361	286	369	119	218.4
Anstruther	120	138	148	153	176	140	163	166	124	59	138.7
Port Seton	73	42	7	74	86	107	29	53	99	40	61
Methil and Leven	26	18	23	15	0	19	10	0	57	139	30.7
Arbroath	35	12	9	8	0	3	3	35	21	1	12.7
Aberdeen	0	10	0	0	0	1	4	0	49	2	6.6
Blyth	2	1	9	5	2	11	1	4	3	0	3.8
Burntisland	0	0	0	0	0	0	6	16	10	0	3.2
Other Ports	17	29	13	7	6	20	7	12	9	18	13.8
Total	2890	3086	2765	2328	2940	3120	3327	3571	3781	3343	3115.1
Under-10 m											
Pittenweem	1652	1569	1447	1070	1511	1670	2210	2786	2445	2615	1897.5
Crail	0	397	587	730	442	417	1274	1277	1234	1036	739.4

Port and Vessel Length	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	10Yr Avg
Methil and Leven	422	490	466	309	401	572	831	709	705	725	563
Dunbar	396	298	477	303	263	154	1451	556	463	397	475.8
Anstruther	270	227	122	73	144	109	325	379	560	591	280
St Andrews	0	3	18	87	164	174	444	565	612	601	266.8
St Monance	0	12	8	58	144	115	249	365	301	254	150.6
Burntisland	0	12	12	3	42	54	200	246	211	159	93.9
North Berwick	10	0	0	0	0	0	427	121	149	85	79.2
Granton	2	0	0	0	0	0	163	147	76	51	43.9
Other Ports	61	8	14	125	38	60	72	79	350	389	119.6
Total	2813	3016	3151	2758	3149	3325	7646	7230	7106	6903	4709.7
Non UK											
Lochinver	1	0	0	0	0	0	0	0	0	0	0.1
Total	1	0	0	0	0	0	0	0	0	0	0.1
Grand Total	6656	6839	6550	5708	6845	7041	11720	11908	11774	10987	8602.8

7.0 Satellite Tracking

Since January 2005, all European Community vessels of over-15 metres in length have been fitted with satellite tracking equipment which transmits the vessels' position at a minimum of every two hours to the relevant member states' fisheries authorities. Each member states' Fisheries Monitoring Centre monitors the activities of their fishing vessels to ensure compliance with fisheries legislation.

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

It is recognised that satellite data is only indicative of the activity of certain types of fishing vessels, i.e. those over-15 metres in length. Analysis of the landings values and effort levels data sets has demonstrated that the majority of activity in the local study area (ICES rectangle 41E7) is by the under-15 m fleet. It should therefore be recognised that the majority of vessels operating in the immediate area of the proposed development will not be recorded in the analysis of this data set.

Furthermore, the data does not specify whether a vessel is fishing or steaming. Position plots of vessels that are stationary in port have not been included.

7.1 National Overview

Figure 7.1 shows the satellite (VMS) density of all UK vessels over-15 metres (average 2005-2008). Areas of high density are generally concentrated along the west coast of Scotland and in offshore areas in the north-east of the national study area. The Forth and Tay area records a moderate level of patchy activity.

7.2 Regional Overview

7.2.1 2005-2008 Data

Figure 7.2 shows the satellite (VMS) density of all UK vessels over-15 metres (average 2005-2008). It can be seen that there are two main concentrations of activity; north of the proposed development in an area extending north-east and adjacent to the coast; south-west of the proposed development, extending from the northern end of the Firth of Forth and south along the coast. It should be noted that although vessels are categorised by fishing method within this data set, the majority of vessels are recorded as 'null'. Identifying density by gear type would therefore be misleading.

7.2.2 2009 Data

Figure 7.3 shows the satellite (VMS) density of all UK vessels over-15 metres in 2009. Figure 7.4 and Figure 7.5 show the density of vessels targeting nephrops (demersal otter trawls) and scallops, respectively. Unlike the 2005-2008 data, categorisations of gear type have been accurately identified for this data set. When compared with the average density chart for 2005-2008, it is apparent that the higher density of activity to the north of the proposed development is attributable to scallop dredging vessels and the concentration of sightings to the south is from vessels targeting nephrops.

7.2.3 Export Cable Route

The export cable route passes through a relatively high density area of recorded activity by vessels operating nephrops trawl gear. Activity is recorded in inshore areas, but is low in the immediate area of cable landfall(s) (Figure 7.4).

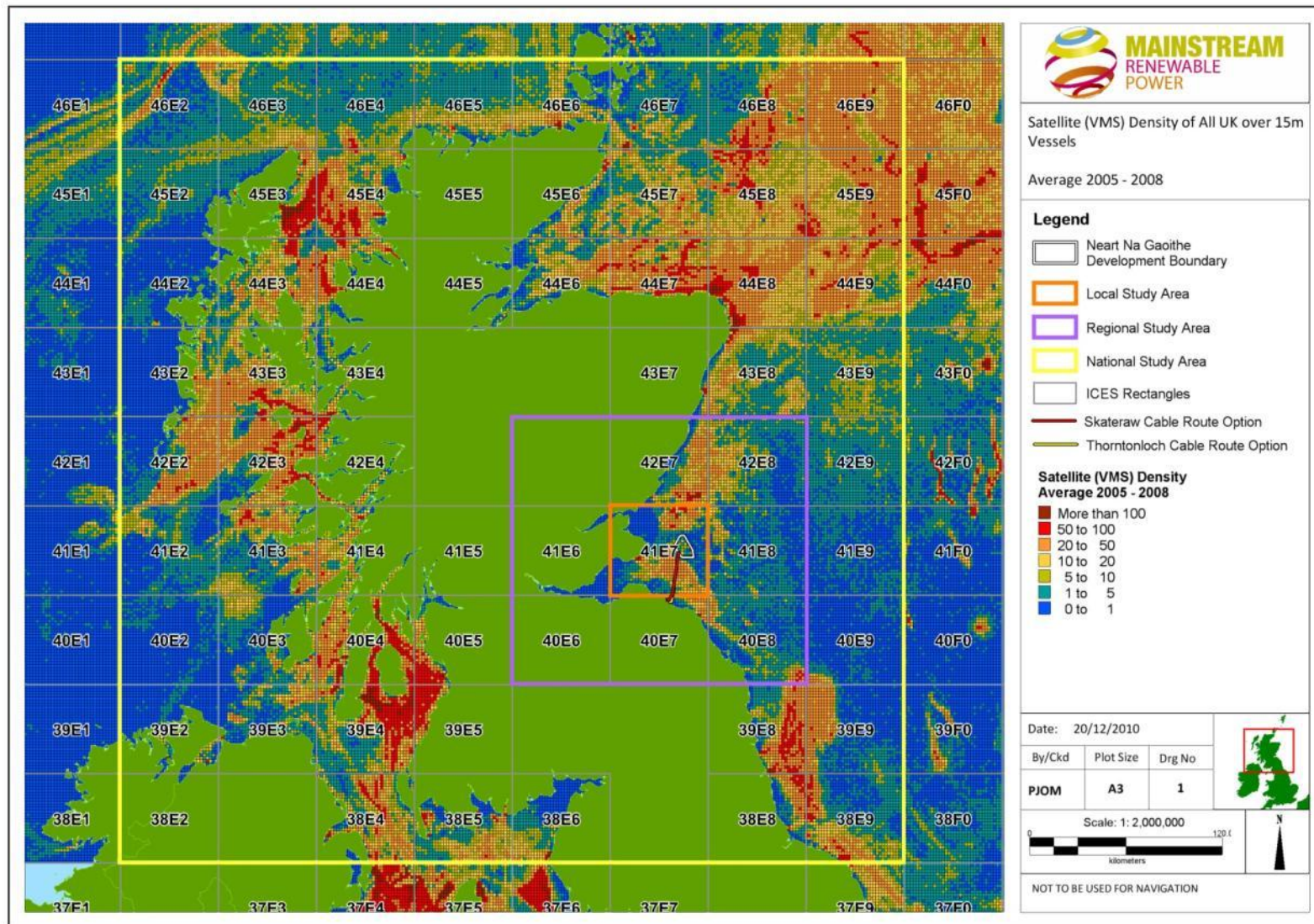


Figure 7.1 Satellite (VMS) Density of all UK over-15 metre Vessels (average 2005-2008)

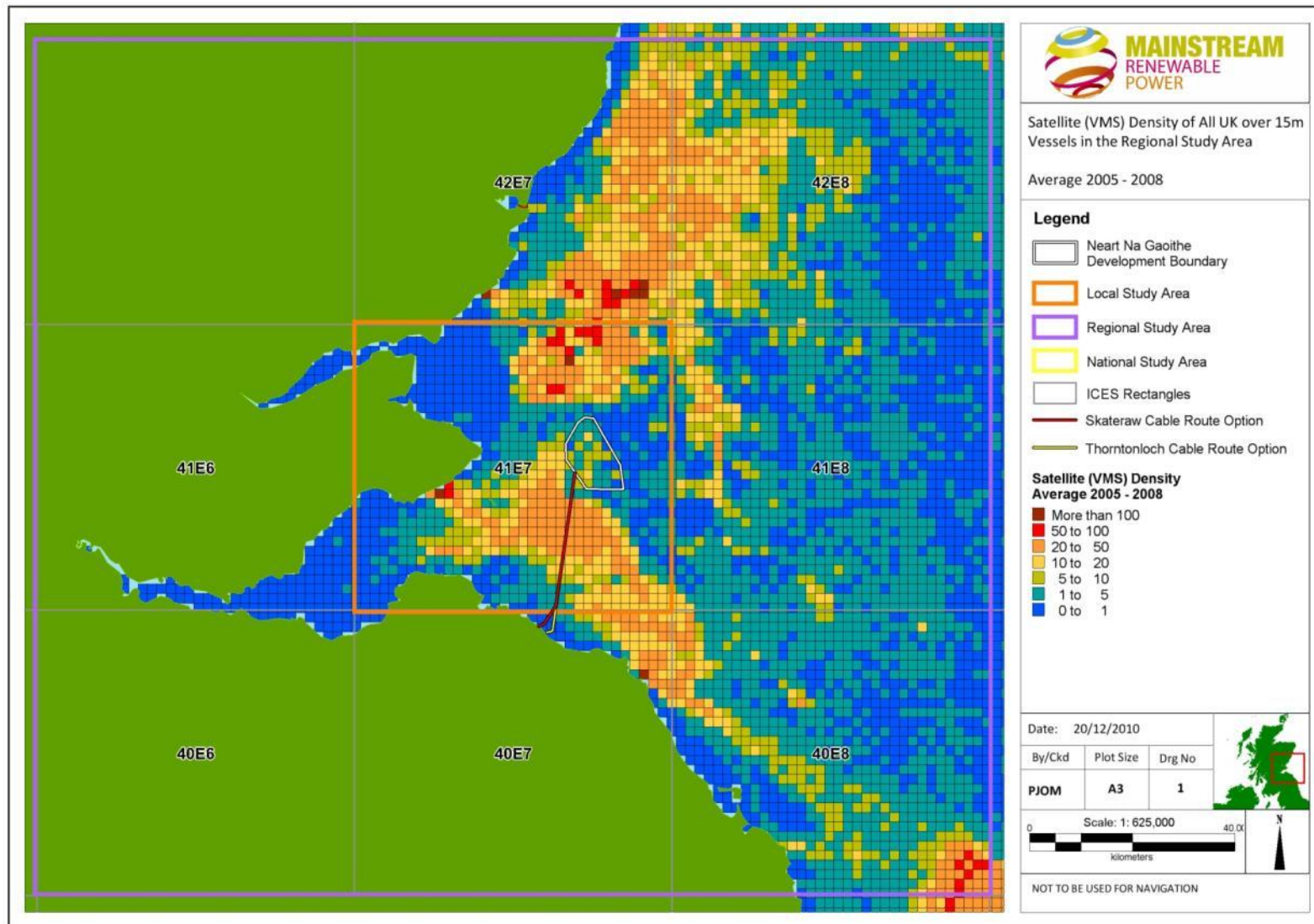


Figure 7.2 Satellite (VMS) Density of all UK over-15 metre Vessels (average 2005-2008)

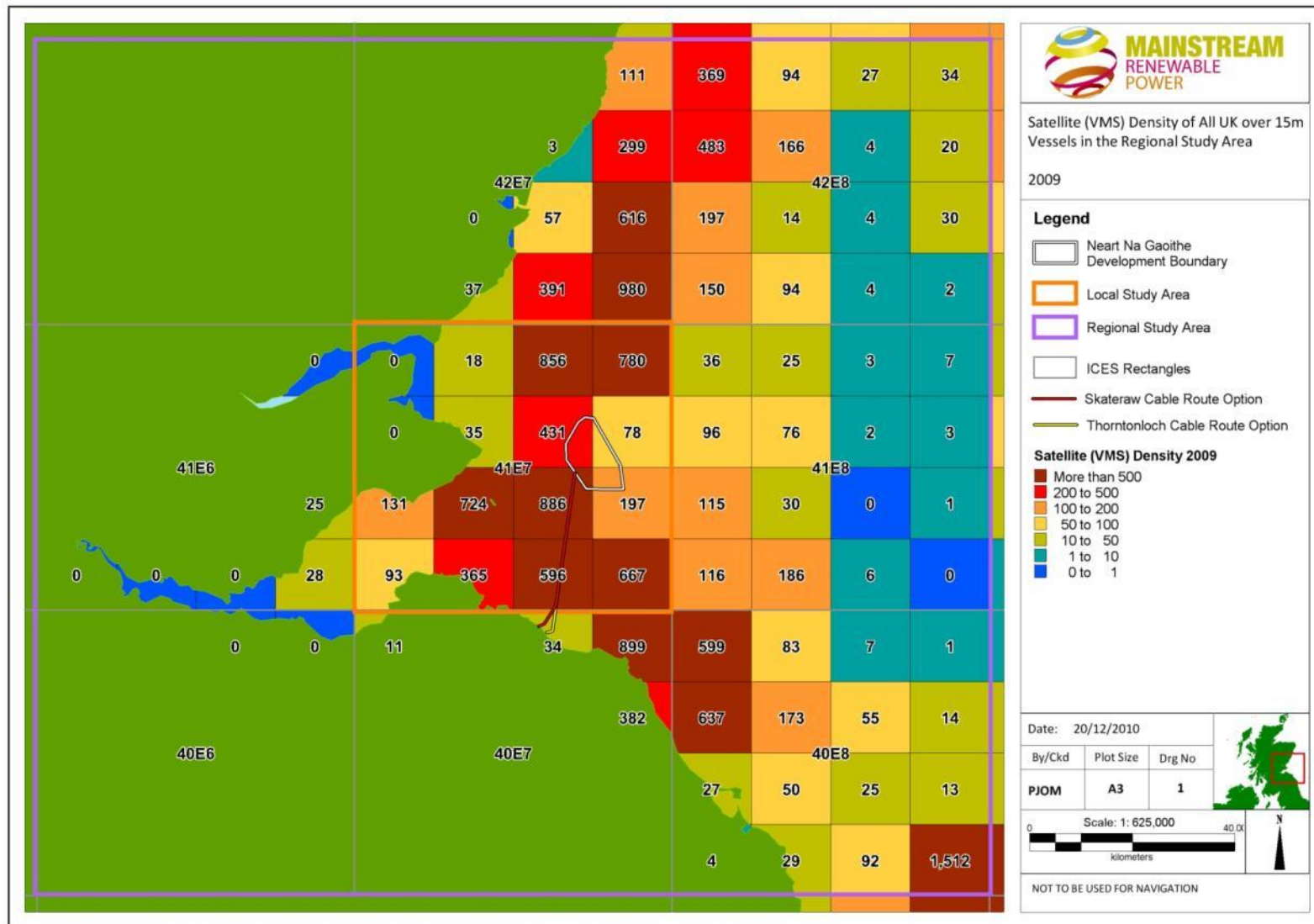


Figure 7.3 Satellite (VMS) Density of all UK over-15 metre Vessels in 2009

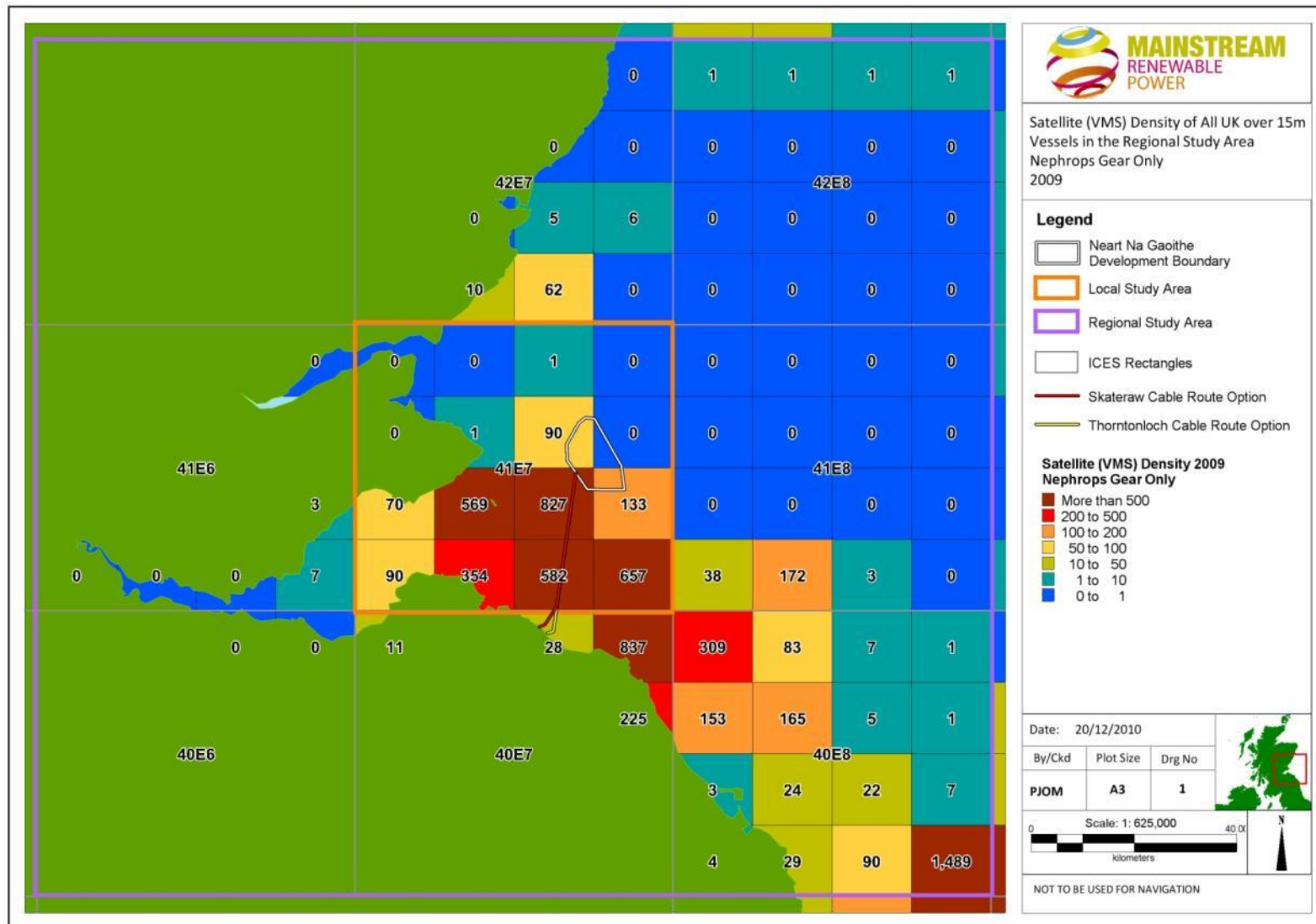


Figure 7.4 Satellite (VMS) Density of UK over-15 metre Vessels in 2009, Nephrops Gear Only

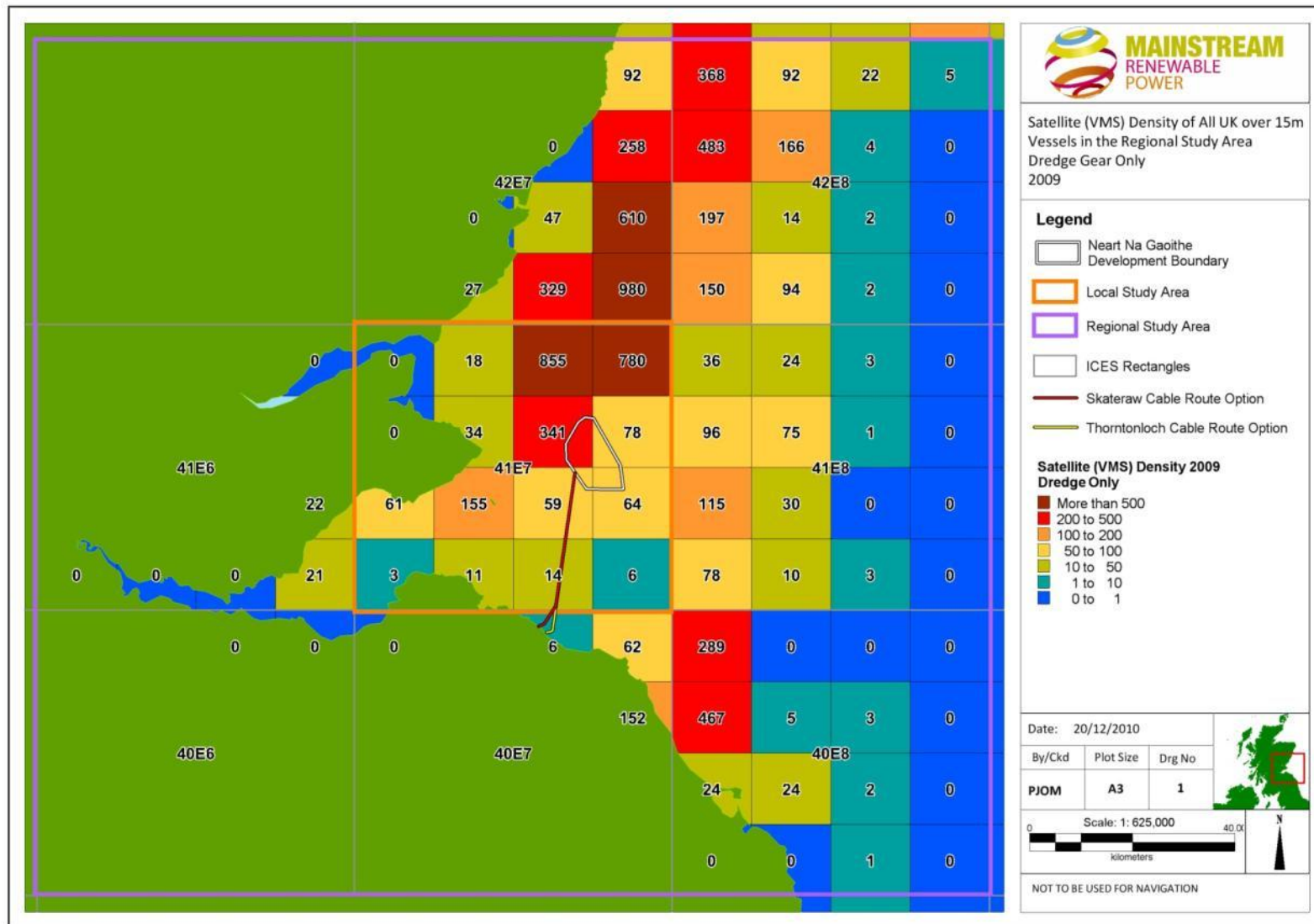


Figure 7.5 Satellite (VMS) Density of UK over-15 metre Vessels in 2009, Scallop Dredge Gear Only

8.0 Marine Scotland Data Analysis

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 Forth and Tay area.

The data set shows the distribution of commercial fishing landings from vessels exceeding 15 metres in length, by weight and value in Scottish waters for the years 2007-2009. The VMS records were fed into the Fisheries Information Network, which is the Scottish Government's sea fisheries database. In addition to the VMS records, the Fisheries Information Network also holds information on voyages (catches, gear, mesh size, etc) and on landings (weight, presentation, price at sale, etc).

The VMS records, as described in Section 7.0, are linked to landings data through one unique identifier common to both databases: the *Registry of Shipping and Seamen number*, which identifies the vessel (this identifier is otherwise protected information). *Logtime*, the date and time of each VMS transmission, identifies the voyage by laying within the voyage start and end date times. This allows the linking of the location of the vessel at each trip to the weight of the landings and the value of the sale produced by that trip.

The speed of the vessel at the time of each VMS transmission has been used as a filter to eliminate those vessels steaming and not fishing. It has been assumed that vessels of 5 knots or over would be steaming.

The information displayed in the chart describes landings of a fishing trip. Although a single trip will generally be comprised of a number of fishing events, information on catches per fishing event are not available and as a consequence multiple fishing events of a single trip are attributed with the overall landings weight and values for that entire trip.

All information regarding the identity of individual trips or vessels is anonymous. As has been previously stated, the limitations of VMS monitoring only the over-15 metre fleet apply.

Figure 8.1 to Figure 8.3 show the distribution of commercial fishing gears of the over-15 metre fleet in the Forth and Tay area between 2007 and 2009, respectively. It can be seen that demersal trawls towing small mesh nets and boat dredges (scallop dredges) are the only gears employed within the proposed development during the three year period. Furthermore, it appears that dredging vessels record a greater distribution within the proposed development.

Figure 8.4 to Figure 8.6 show the relative density of commercial landings of shellfish, nephrops and scallops, by the over-15 metre fleet in the Forth and Tay area between 2007 and 2009, respectively. Nephrops are principally targeted by demersal vessels towing small mesh nets, and scallops are the target species of boat dredges. It can be seen that the proposed development is approximately situated between scallop grounds in the north-east, and nephrops grounds to the south-west. As with the previous figures, scallop dredging records relatively higher densities within the boundary of the proposed development.

As has been previously stated, and as is demonstrated in Section 6.0, the majority of landings values and effort is by the under-15 metre fleet (Figure 6.6 and Figure 6.20) and the assessment provided in this Section is not therefore representative of the majority of vessels in the area.

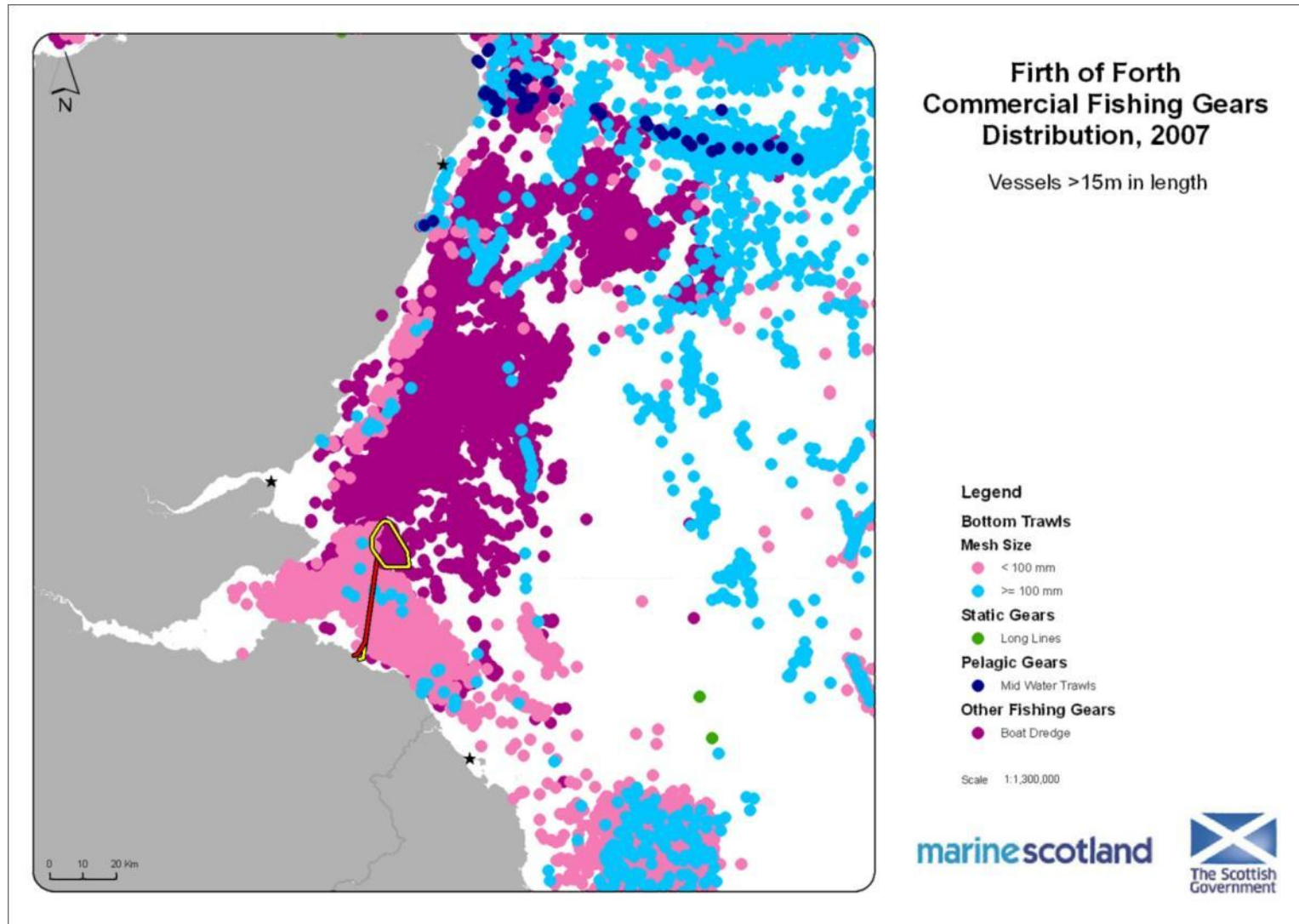


Figure 8.1 Fishing Gear Distribution for over-15 metre Vessels, 2007

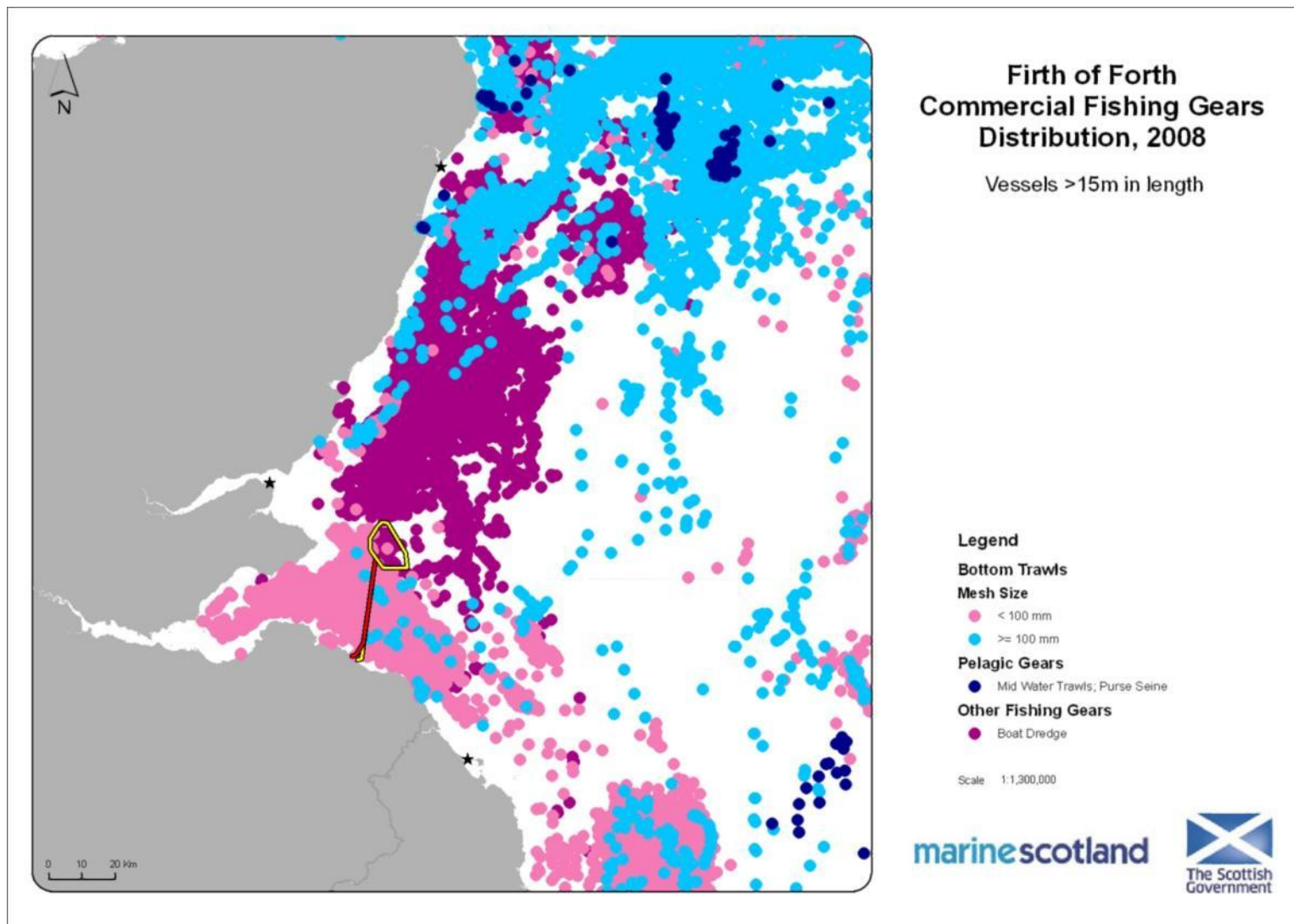


Figure 8.2 Fishing Gear Distribution for over-15 metre Vessels, 2008

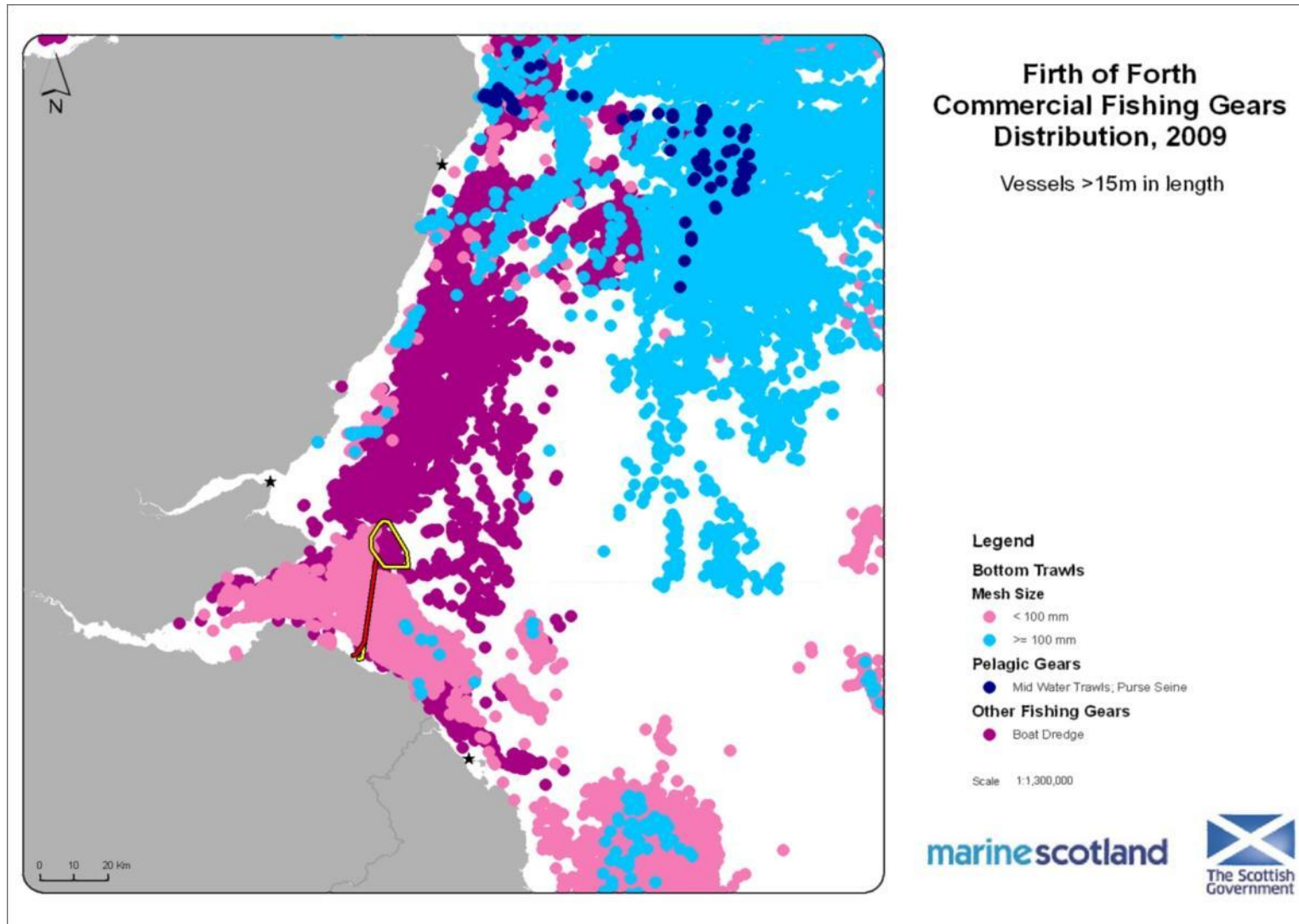


Figure 8.3 Fishing Gear Distribution for over-15 metre Vessels, 2009

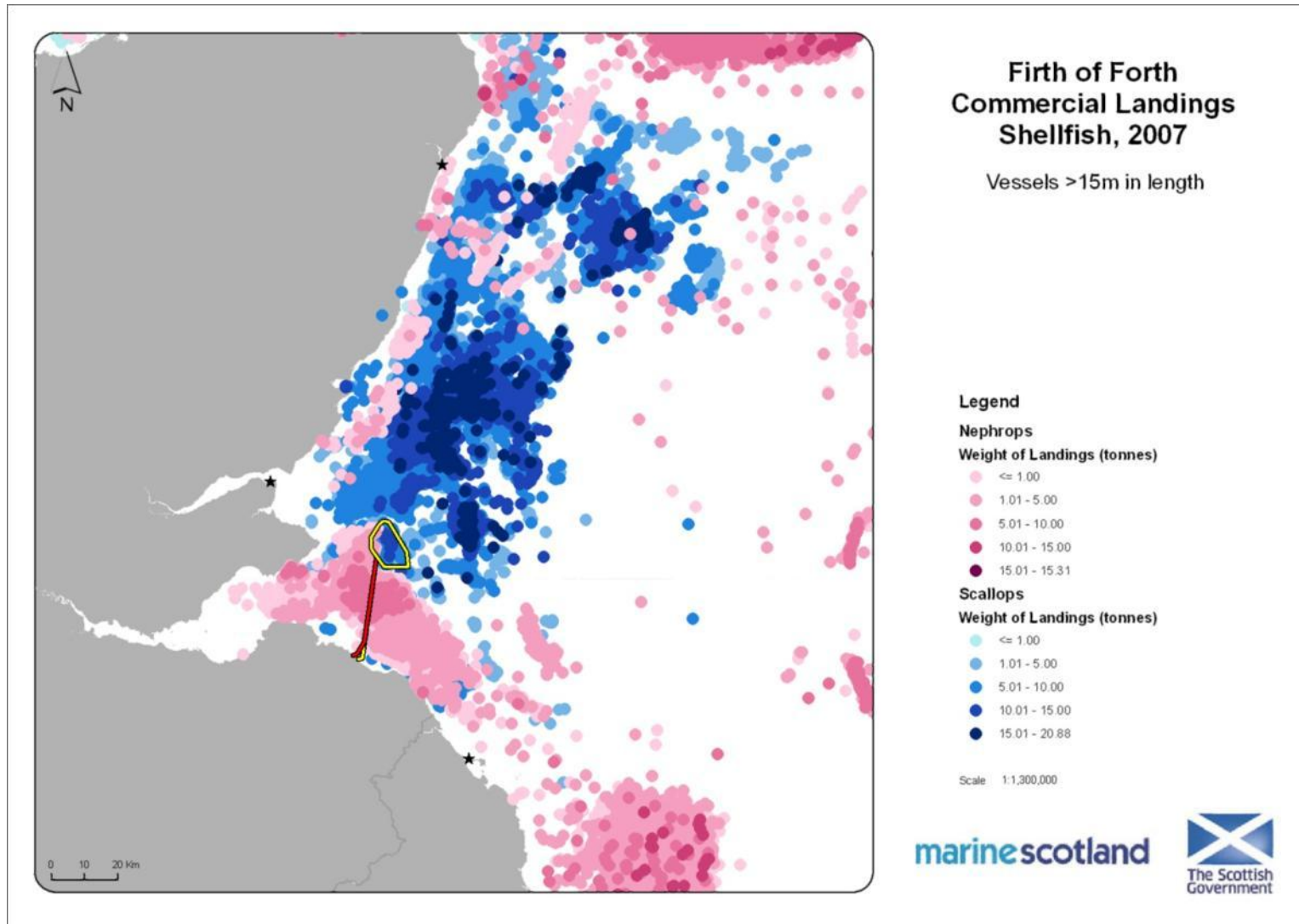


Figure 8.4 Commercial Landings of Shellfish (Nephrops and Scallops) for over-15 metre Vessels, 2007

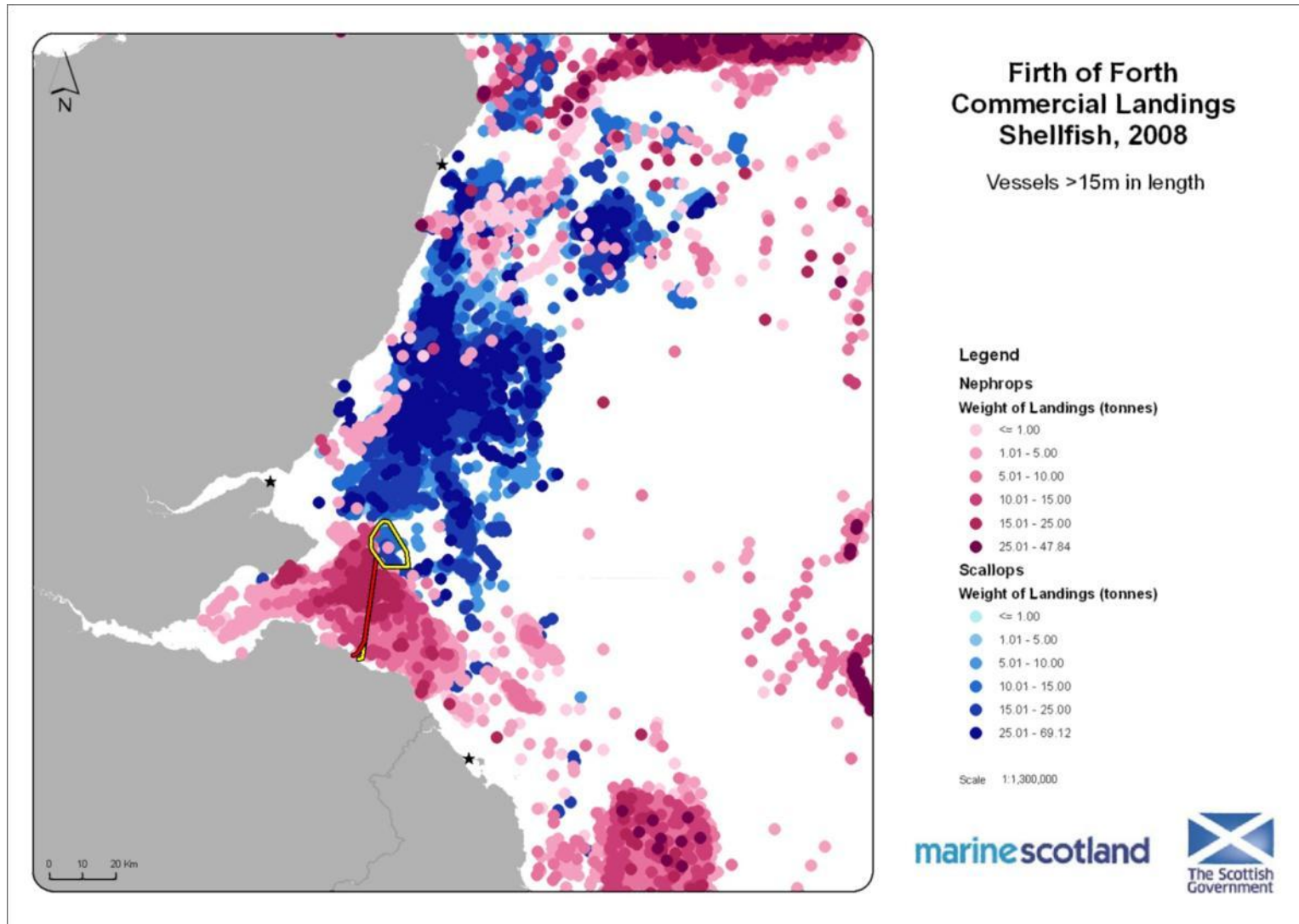


Figure 8.5 Commercial Landings of Shellfish (Nephrops and Scallops) for over-15 metre Vessels, 2008

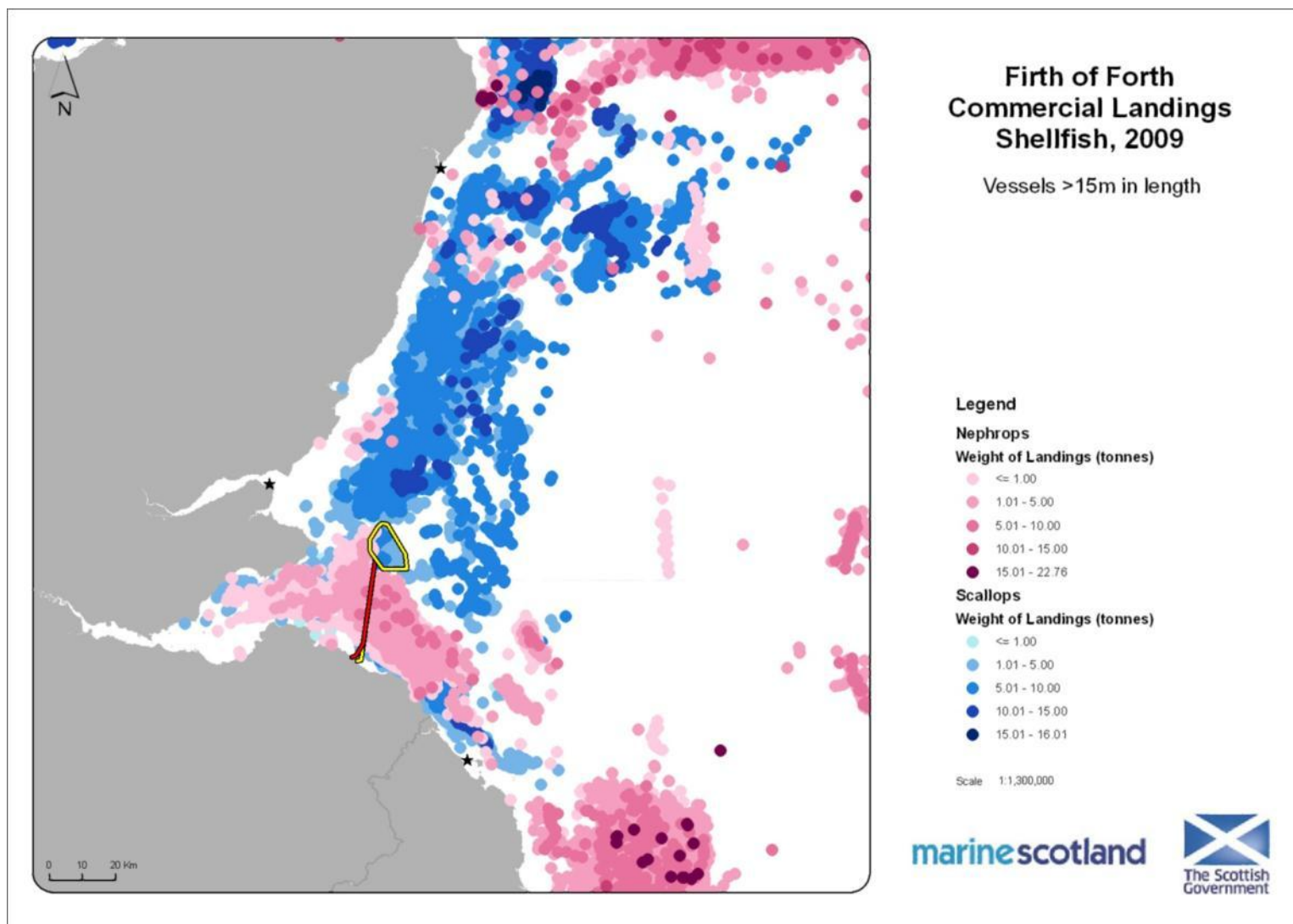


Figure 8.6 Commercial Landings of Shellfish (Nephrops and Scallops) for over-15 metre Vessels, 2009

9.0 Fisheries Surveillance Sightings

Figure 9.1 gives the positions of vessels identified by Fisheries Protection surveillance by method in the regional study area. Vessels of all lengths are recorded. It can be seen that the sightings broadly corroborate the analysis of the MMO data sets, and the satellite (VMS) density, with scallop dredgers sighted in areas to the north, and trawlers (yellow and pink dots) in the Firth of Forth and areas to the south. In addition, the sightings show trawl and potting activity along the north coast, and additional potting in a concentrated area in the far south.

It is of note that a significant proportion of demersal vessels have been sighted inside the Firth of Forth SI restricted area, where this fishing method is prohibited.

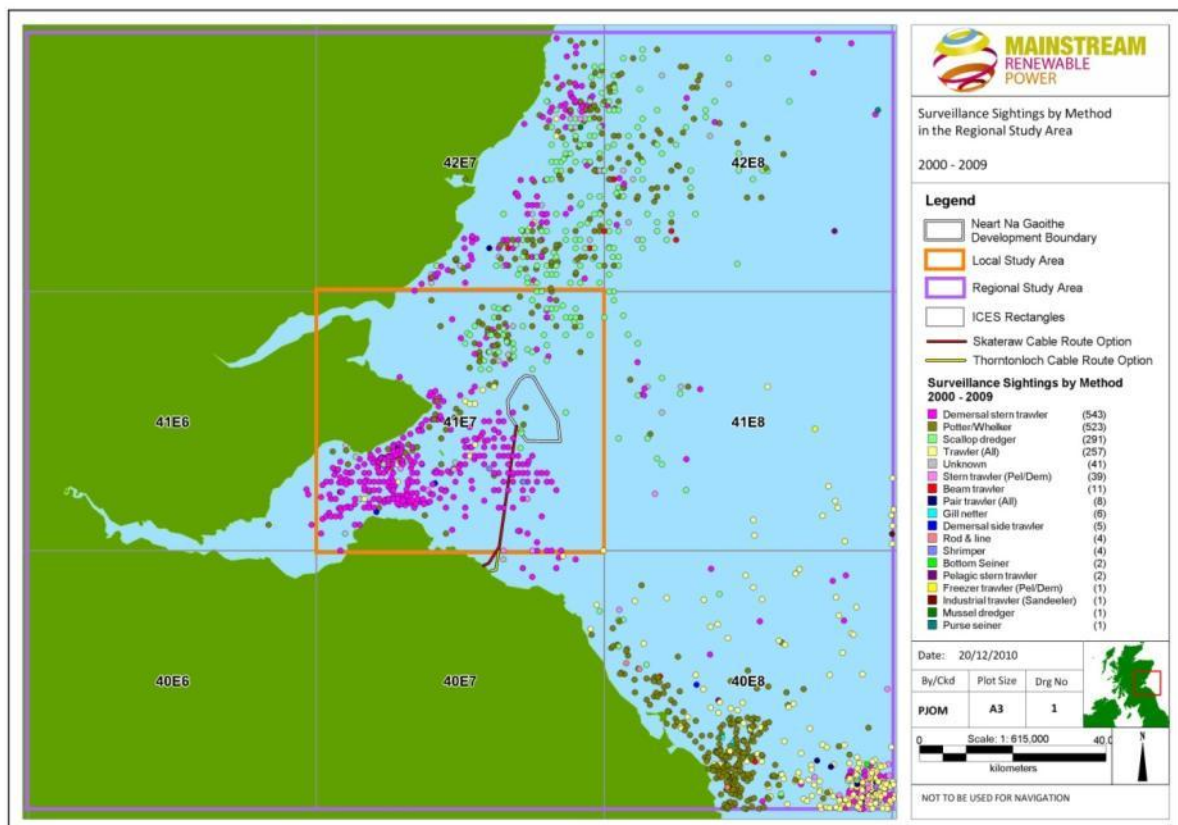


Figure 9.1 Surveillance Sightings by Method in the Regional Study Area

9.1 Export Cable Route

As is the case with the satellite tracking analysis, the export cable route passes through an area that has relatively high recorded sightings of demersal stern trawlers, likely targeting nephrops.

10.0 Fishing Methods, Operating Patterns and Practices

The principal fishing methods undertaken in the immediate area of the proposed development are:

- Demersal trawling
- Scallop dredging
- Potting

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 regional study area has informed the assessment. Where applicable, analysis of the statistical data sets discussed previously is cross-referenced.

10.1 Demersal Otter Trawling

10.1.1 Trawling for Whitefish

Demersal trawling is the most common fishing method in Scottish waters in terms of vessel numbers. Figure 10.1 shows the basic gear configuration of a single rig demersal otter trawl.

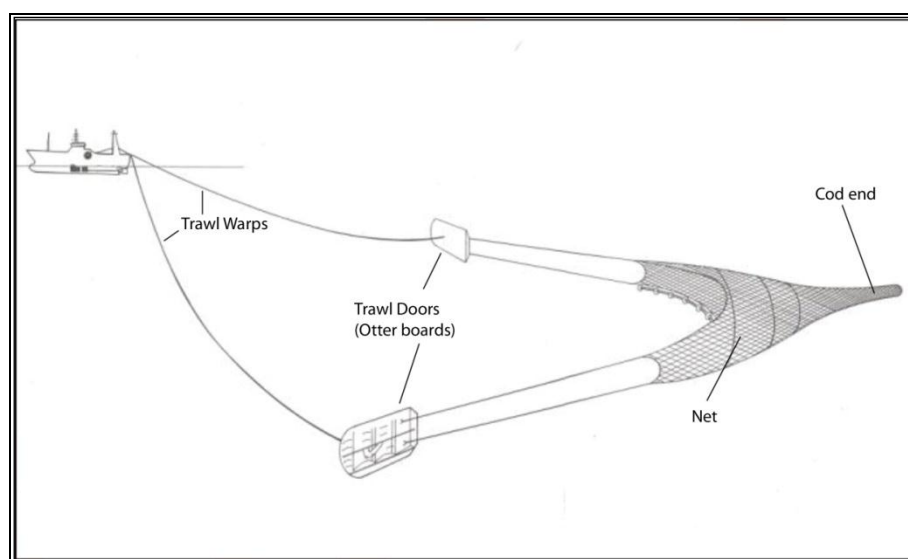


Figure 10.1 Single Net Demersal Otter Trawl (created by BMM)

Historically, the demersal otter trawl fleet in the Forth and Tay area targeted whitefish such as cod and haddock, in addition to Scottish seine vessels. The fishery started to decline in the mid 1950s. Dwindling cod stocks throughout the North Sea resulted in a series of reductions in quota in the 1980s. The whitefish trawl fishery is for the most part a mixed fishery – i.e. multiple demersal species are simultaneously caught – and the restrictions upon the landing of cod have had a detrimental impact on the fleet's ability to fish alternative species. In addition, cuts to cod 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. As a result of a lack of available quota, demersal trawlers have diversified into the nephrops fishery, where quota levels are not so restrictive.

There are currently no whitefish trawlers in the Forth and Tay area, and furthermore, it is not considered that vessels will return to the fishery in the future, as a result of both a perceived lack in target species as well as a lack of available quota based upon track record (since the 1980s). It is considered that the low level of cod and haddock landings recorded in the MMO statistics are by-catches from the other demersal fisheries discussed later.

10.1.2 Nephrops Trawling

As is demonstrated in the analysis of MMO statistical data sets, nephrops (also known as Langoustines and Norwegian Lobster) are the single highest value species landed in the national study area (£57,981,132, average 2000-2009), recording 41% of the total value. All of the demersal otter trawl vessels operating in the Forth and Tay area target nephrops.

Nephrops gear is configured in the same way as that used to target whitefish (see Figure 10.1), with nets modified to target the species. Nephrops inhabit burrows in the seabed and favour muddy and soft substrates. Vessels tow one or more trawl nets (single or twin rig) along the seabed, the lateral openings of which are affected by the trawl doors. The ratio of towing warp paid out to water depth is generally 3:1.

Vessels target nephrops year round although there are seasonal fluctuations in catches, as discussed previously in Section 6.0. Of the skippers sampled, the total number of annual fishing days ranged between 145 and 280. As a result of the limited size of vessel in the area, weather conditions are a significant factor in determining levels of activity in the winter months.

10.1.3 Trawling for Squid

Demersal otter trawls are capable of targeting squid, and will reconfigure gear to target the species when it is present. Due to the relatively short lifespan and variable breeding success and survival rates, the squid fishery fluctuates from year to year.

In recent years the squid fishery has become a valuable alternative fishery for nephrops trawlers, chiefly supplying the European market. The fishery is unregulated, so there are currently no restrictions upon the activity (either in quota or effort). Ability to target the species can relieve pressure on regulated stocks such as nephrops.

The squid fishery is usually of short duration but is reported to have been extending in recent years. The fishery has become increasingly important to local trawl fishermen, particularly during periods where other fisheries experience low catch rates. 2010 was reported to be a very good year for squid landings, although this will not be reflected in the annual landings values until they are released in the third quarter of 2011.

Squid grounds are not fixed, and fishermen stated they were targeting the species in grounds further offshore than previously recorded (pers. comm. Fishermen's Mutual Association (FMA), Oct 2010). Furthermore, it was considered that there is the potential for squid grounds to change in future years. A number of fishermen consulted considered that squid grounds are not moving, instead new squid grounds are still being discovered, as a result of the relatively recent introduction of the fishery. Current squid grounds, as identified by trawl fishermen, are discussed in Section 12.0.

In order to target the species, vessels will reconfigure their demersal gear slightly (see Figure 10.1). Nets are changed to those with a smaller mesh size of 40 mm. Nets will have high headlines (i.e. the top of the net is higher in the water column), as the species is caught off the seabed. Squid are often targeted on rocky or uneven ground, and vessels targeting the species will employ additional protective gear such as rockhoppers (rubber disks attached immediately ahead of the ground-line to allow net to pass over rough ground) or 'flipper' gear (rubber mats fixed between the net and seabed to protect nets from rough ground) to minimise damage to nets.

The timing of the squid fishery is dependent upon the arrival of the species in the area, but the peak season is generally around August and September. Fishermen have however stated that 2010 has

seen an unusually long squid season, with activity continuing into November (pers. comm. FMA, Oct 2010).

10.2 Scallop Dredging

Scallop vessels generally tow between one and two beams onto which a number of dredges are attached, depending on vessel size, engine power and winch capacity. The number can vary from three or four on a 10 metre boat, and up to 18-20 on a 30 metre vessel with 1500hp. The principal type of dredge used is the English 'Springer' type whereby the scallops are 'raked' from the seabed by steel teeth that are attached along the leading edge of the dredges which penetrate the seabed to a depth of approximately 20cm (see Figure 10.2).

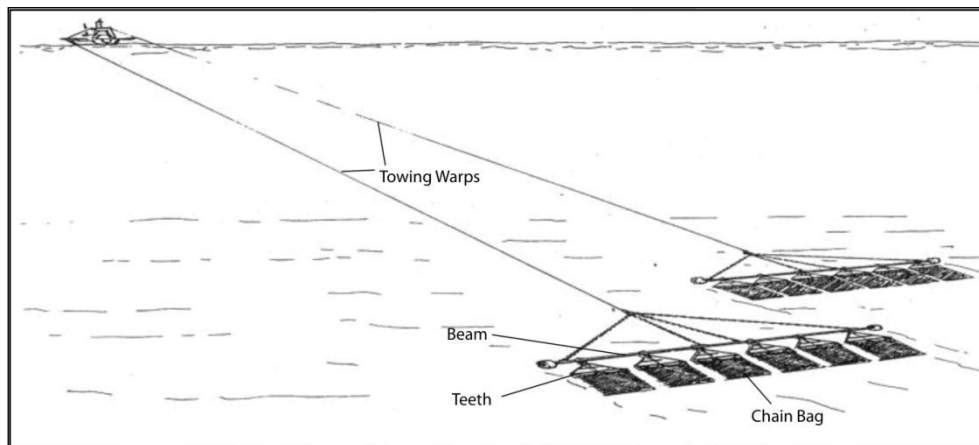


Figure 10.2 Springer Scallop Dredges (created by BMM)

By virtue of their activity, a number of scallop vessels are nomadic, fishing one location before moving to another and finally returning when the ground is thought to have recovered. In this way most of the suitable grounds around Scotland are fished. Visiting vessels from both the east and west coast of Scotland periodically fish scallop grounds in the Forth and Tay area, and in addition there are several locally based vessels which concentrate their scallop dredging activities in the area.

Scallop dredging is undertaken year round. Landings data for the regional study area does however show low recorded landings in the winter months, and a peak during the summer.

10.3 Creeling

Creels are essentially traps baited to catch mobile shellfish such as lobster, crab or nephrops. Creeling is the setting of a number of creels on a main line which are then deployed on the seabed for an average soak time of three days, although this can be extended during periods of bad weather (see Figure 10.3).

The priority of this fishery is the delivery of live catch. The scale of this activity can range from a 'hobbyist' fisherman setting 20 pots, to the long range vivier crabber which may set more than a thousand creels. Catch can be kept alive in cages located on the seabed, or in purpose-built onboard vivier tanks (large vessels only).

Within the Forth and Tay area, pots are generally set in inshore waters, inshore of the boundaries of the proposed development, although there are several larger category vessels which are known to fish deeper waters further offshore, on occasion up to 20-25 miles from their home port.

Lobsters, the principal species landed, generally favour rocky, uneven ground and wreck sites, and the grounds targeted by potters generally have such substrates. The Bell Rock area, for example, to the north-west of the proposed development, is a productive lobster ground.

In addition to potting vessels operating on a full time basis, a large number of registered boats will be part-time. These vessels will generally operate in the summer months, and hauled out in the winter.

It is a legal requirement for all vessels, including part-time boats, landing in excess of 200 kg of lobster and 750 kg of crab to have a Shellfish Entitlement, although in some instances this may not always be the case.

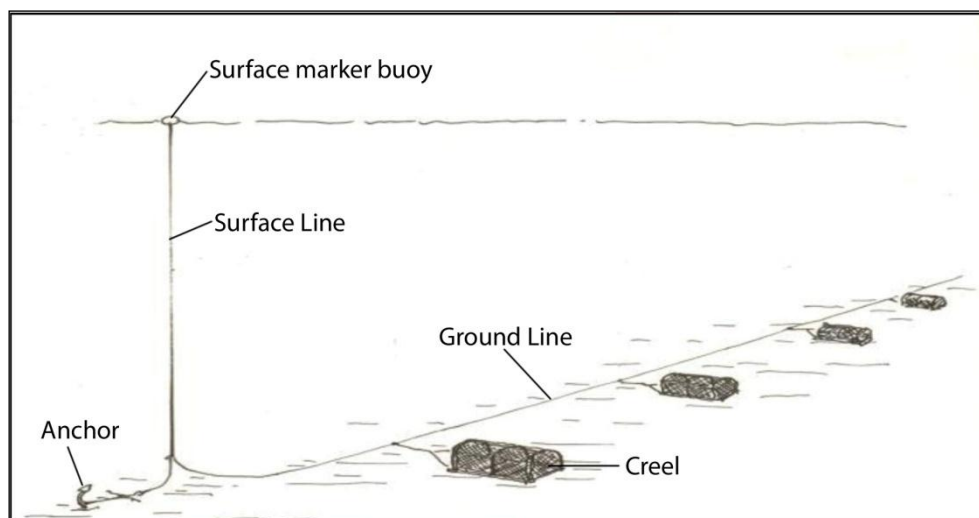


Figure 10.3 Fleet of Creels (created by BMM)

11.0 Vessels, Gear and Fishing Activity by Port

The large majority of vessels active in the vicinity of the proposed development have home ports within the jurisdiction of the three fishery districts encompassing the Forth and Tay area:

- Aberdeen Fishery District (Aberdeen down to the north side of the Tay Bridge)
- Anstruther Fishery District (south side of the Tay Bridge to the north side of the Kincardine Bridge)
- Eyemouth Fishery District (South side of the Kincardine Bridge down to the Scottish border)

Anstruther is the principal district relevant to the proposed development. The district is in closest proximity to the proposed development and the majority of vessels active in the local study area are based at ports within its jurisdiction (pers. comm. Anstruther Fishery Office). The following section describes the activities of fishing vessels operating out of local ports within the three districts, with a greater focus on the Anstruther district.

The export cable route runs south from the proposed development and passes through grounds that are predominantly targeted by vessels from the Eyemouth Fishery District. The activity of these vessels relevant to the cable route is further discussed in Section 11.3.

It should be noted that on occasion towed gear vessels from ports outside of the districts above will fish the area, known as visiting vessels. These are separately discussed in Section 11.4.

The information provided below has been gathered primarily through consultation with the relevant District Fishery offices, and fishermen, their associations and representatives. Where possible, information has been cross referenced with statistical data sets (MMO vessel lists). The locations of fishing grounds, identified by fishermen, are provided in Section 12.0.

11.1 Anstruther Fishery District

Anstruther fishery district is bounded in the north by the Tay River and in the south by the River Forth. Vessels operating out of ports in the Firth of Forth are tidally restricted (with the exception of Methill and Burntisland), and as such their departure and return to and from port is possible only at high waters, limiting their fishing times to multiples of approximately twelve hours.

The principal fishing port in the district is Pittenweem, at which the large majority of towed gear boats are based. Landings and values data identify Pittenweem as the most important fishing port in the local study area. FMA is also located in Pittenweem, and is the principal selling agency of catch landed into the port by its members within the Firth of Forth and North Sea. The Association also expresses the views of East Neuk based fishermen and their representatives to promote and safeguard the fishing industry in the Firth of Forth (pers. comm. FMA, Oct 2010).

As is discussed in Section 10.1.1, demersal otter trawlers historically targeted whitefish such as cod and haddock, but a combination of factors, including a severe decline in species' numbers and a corresponding reduction in quota and effort allowances, required the sector to target alternative species, such as nephrops. Nephrops are now the principal focus of the demersal fleet in the Anstruther area. Vessel A (length 17.2 m), is an example of a resident vessel, manufactured in 1966 as a seine netter targeting whitefish and later converted to bottom otter trawls targeting nephrops. All nephrops trawlers are able to reconfigure their nets to seasonally target the squid fishery.

Smaller, inshore vessels have historically landed shellfish such as lobster and crab from the Firth of Forth area, and these species continue to be commercially important to the district.

The majority of smaller fishing vessels only undertake day trips, with an occasional vessel going to sea at night. This ensures the freshness of the product landed, which is a source of local pride. Fishing activity is weather dependent, and if it is bad vessels will restrict their activities to within the Forth. As has been previously stated in Section 5.6, vessels over 16.77 metres are prohibited from fishing within the Forth.

It has been reported that there is occasional conflict between the static and towed gear fleets as a result of the relatively large number of vessels operating and competition for the same grounds, particularly with regard to vessels targeting scallops and squid. In addition, some skippers noted that large, non-fishing traffic in the Forth had on occasion disrupted static gear, and in some instances towed gear away. Claims to compensate for lost gear are ongoing (Fishermen’s Mutual Association, October 2010).

The majority of vessels within the Anstruther district are under-15 metres in length. With regard to the demersal towed gear fleet, the collapse of certain fisheries, in addition to economic constraints such as rising fuel and crew costs, helped to bring about a decline in the larger category of vessel. Creel boats in the district are under-10 metres. The limited length of vessels restricts their range of operation, largely by reducing their capacity to operate in deeper waters at greater distances from their home port (i.e. economic viability and safety issues) and in inclement weather conditions.

Table 11-1 below shows the number of vessels by length and principal fishing method in the district, as provided by the Anstruther Fishery Office. Limitations of the figures provided by the Fishery Office should however be noted: a number of vessels on the register are no longer active, which results in slightly higher numbers than are actually active. These vessels have not been removed from the list of active vessels because they still have a registered fishing license.

Table 11-1 Number of Vessels by Length and Principal Fishing Methods (Anstruther Fishery Office, October 2010)

Vessel Length Category	Number of Vessels	Principal Fishing Method
Under-10 metres	92	Large majority are creel boats
10-15 metres	16	Demersal nephrops trawls 1 scallop dredge 1 creel boat
Over-15 metres	2	1 demersal trawl 1 scallop dredge

Provided in Table 11-2 below are demersal trawl vessels still on the Fishery Office register but known to not be actively fishing at the time of writing. It is possible that further vessels will cease to actively fish in the upcoming years.

Table 11-2 Inactive Vessels

Vessel	Status
Vessel B	Gear sold, not fishing
Vessel C	Fleet Resilience Scheme
Vessel D	Fleet Resilience Scheme
Vessel E	Sold
Vessel F	Lying empty

NB: Fleet Resilience Scheme is described in Section 5.1

11.1.1 Demersal Trawl Vessels (Nephrops and Squid)

Provided in Table 11-3 below is a summary of the demersal trawl vessels with home ports in the Anstruther district currently operating in the vicinity of the proposed development. As has been previously stated, these vessels will principally target nephrops, and squid on a seasonal basis. Fishing grounds are separately discussed in Section 11.

Table 11-3 Demersal Trawl Vessels by Home Port in the Anstruther Fishery District

Vessel	Length (m)
Vessel G	9.5
Vessel H	9.86
Vessel I	9.79
Vessel J	9.74
Vessel K	9.7
Vessel L	9.79
Vessel M	9.95
Vessel N	9.98
Vessel O	11.4
Vessel P	13.6
Vessel Q	11.67
Vessel R	11.58
Vessel S	11.2
Vessel T	12.19
Vessel U	11.85
Vessel V	12.94
Vessel A	17.2

The information given below has been provided by individual skippers of five demersal trawl vessels based in Pittenweem. All vessels are members of the Pittenweem Fishermen's Mutual Association. Basic vessel details are given in Table 11-4 below.

Table 11-4 Bottom Trawl Vessels by Length and Engine Power

Vessel	Length (m)	Engine Power (hp)
Vessel K	9.70	185
Vessel A	17.2	180
Vessel V	12.94	194
Vessel R	11.58	173
Vessel P	13.65	279

Table 11-5 below shows the general fishing practices of the five bottom otter trawls. Vessel K does not have quota restrictions as a result of being under-10 metres in length. The duration of fishing trips is restricted by access to port, due to the tide.

Table 11-5 General Fishing Practices

Vessel	Seasonality of Fishing Activity	Days at Sea Allocation	Days Fishing per Year	Distance Steamed per Trip	Trip Duration
Vessel K	Nephrops – 9 months Squid – 3 months	N/A	240	20	1-2 days
Vessel A	12 months – nephrops and squid	200	200	20	12-18 hours
Vessel V	Nephrops (soft ground) – 10 months Squid (rockhopper) – 2 months	200	145	30-35 NM	1 day
Vessel R	12 months – nephrops and squid	200	160	20-30	16 hours
Vessel P	Nephrops – 8 months Scallops – 4 months	200	220	16	1 day

11.1.2 Scallop Dredge Vessels

There are two scallop dredging vessels operating full-time out of the Anstruther district, Vessel W and Vessel X. Vessel X is a 17 m vessel operating out of Pittenweem, and a member of the FMA. Basic details of Vessel 23 are provided in Table 11-6 below. Scallop fishing grounds are discussed in Section 11.

Table 11-6 Basic Specifications of Vessel W

Fishing Vessel	Vessel W
Home Port	Burntisland
Length	20.29 metres
Main Engine Power	500 hp
Fishing Association	Scallop Association
Typical Fishing Trip Duration	10 days
Typical Distance Steamed per Trip	50 NM
Seasonality of Activity	12 months
Average no. of Days Fishing per Year	200 days per year
No. of beams per side	2
No. of Dredges per beam	8
Estimated Total Gear Width	18 m (beam end to end)
Average Towing Speed	2 knots
Average Towing Duration	1.5 hours
Average Tow Length	3 NM

In addition to the vessels listed above, the nephrops trawl vessel, Vessel P, fishes for scallops on a part-time seasonal basis – four months of the year, between February and June.

11.1.3 Static Gear Vessels

There are approximately 80 static gear vessels at ports within the Anstruther district. These vessels operate creels for lobster and crab. The principal ports for creel boats in the Anstruther district are provided in

Table 11-7 below. Creel fishing grounds are separately discussed in Section 11.

As has been previously shown in Table 11-1, with the exception of one vessel, boats are under-10 metres in length. Provided in Table 11-8 and Table 11-9 below are the specifications of two creel vessel operating full-time out of Pittenweem.

Table 11-7 Anstruther District Ports with Creel Vessels

Port
St Andrews
Crail
Anstruther
Pittenweem
St Monance
Elie
Methil
Kilkardy
Dysart
Kinghorn
Burntisland
Aberdour
North Queensferry

Table 11-8 Vessel and Gear Specifications, and Fishing Practices of Vessel Y

Fishing Vessel	Vessel Y
Length	9.94 metres
Main Engine Power	130hp
Typical Fishing Trip Duration	1 day
Typical Distance Steamed per Trip	25 NM
Seasonality of Activity	months
Average no. of Days Fishing per Year	280 days per year
Principal Species targeted	Lobster, crab and clam
Fishing Gear Employed	Parlour pots
Seasonality of Fishery	12 months
Typical Depth Fished	6-25 metres
Typical Soak Time	Two days
No. of Fleets	40
Fleet Length	550 metres
No. of pots per Fleet	20
Distance between Pots	12 metres

Table 11-9 Vessel and Gear Specifications, and Fishing Practices of Vessel Z

Fishing Vessel	Vessel Z
Length	7.77 metres
Main Engine Power	90 NM
Typical Fishing Trip Duration	7 hours per day
Typical Distance Steamed per Trip	20-30 NM
Seasonality of Activity	12 months
Average no. of Days Fishing per Year	200+ days per year
Principal Species targeted	Lobster, brown crab, velvet crab Mackerel
Fishing Gear Employed	Parlour creels Handline
Seasonality of Fishery	12 months – lobster, brown crab, velvet crab 6 months, June – November - mackerel
Typical Depth Fished	2-35 metres
Typical Soak Time	3 days
No. of Fleets	30
Fleet Length	350 metres
No. of pots per Fleet	15
Distance between Pots	20 metres

Vessel AA is the only over-10 metre vessel targeting lobster and crabs in the Anstruther district. The vessel also employs a hydraulic dredge to target razor and surf clams (Section 11.1.4.1 overleaf). Basic vessel specifications are provided in Table 11-10 below.

Table 11-10 Basic Specifications of Vessel AA

Fishing Vessel	Vessel AA
Home Port	Pittenweem
Length	10.40 metres
Main Engine Power	89hp

11.1.4 Other Commercial Fishing Activities

11.1.4.1 Bivalve Fishery

There is a small bivalve fishery in the Anstruther district. One vessel, Vessel AA, currently operates a small hydraulic dredge, targeting razor and surf clams, in shallow waters off Pettycur Bay (between Kinghorn and Burntisland).

Hydraulic dredges either use jets of water to disturb the ground in front of a towed dredge to capture bivalves such as razor or surf clams, or a pump to suck bottom sediments on board a vessel where bivalves are screened out and the soil discharged back into the sea. This fishery is relatively new to the region, and could potentially provide an additional or alternative focus for fishermen in the future (further discussed in Section 12.0).

Other bivalve grounds, such as St Andrews Bay and Kinshaldy Beach, have protected status and are currently closed to fishing activities.

11.1.4.2 Hand-lining for mackerel

There is a hand-line fishery for mackerel in the summer months between May and November. An estimated 13 vessels are understood to target the fishery, from ports such as Montrose, Arbroath, Eyemouth and Pittenweem (pers. comm. Inshore Fisheries Group (IFG) coordinator, February 2011). These vessels are understood to predominantly operate in inshore waters between Pittenweem and the Isle of May.

11.1.4.3 Netting Activities

There is some netting for spurling and shrimp in the inner Forth, between North Queensferry and Kincardine Bridge.

11.2 Aberdeen Fishery District

The Aberdeen Fishery District is bounded by the north of the Tay Bridge in the south. The principal ports are Arbroath, Gourdon, Stonehaven and Aberdeen. It is considered that the majority of vessels do not operate in the immediate vicinity of the proposed development.

Arbroath is the largest fishing port in the district, primarily for shellfish, and it is currently the one of the most important shellfish ports in terms of landings on the east coast. The principal fishing association is the Arbroath Fishermen’s Association. The Arbroath FA represents around 20 boats: 18 are potters, all under-10 metres; two are nephrops trawlers of approximately 12 metres in length.

Lobster, edible crab, and to a lesser extent velvet crab, are the principal species targeted by the potting fleet. Activity is seasonal: in May to mid June there is almost none as catch rates are low and pots are brought ashore for repairs. Late June to end of September is peak season. Fishing will continue year round but is subject to weather conditions. Basic vessel specifications of nine static gear vessels from the Arbroath fleet are provided in Table 11-11 below. The vessels target edible crab, lobster and velvet crab on a year round basis. Trips are limited to not more than 14 hours duration.

Table 11-11 Basic Vessel Specifications of Static Gear Vessels operating out of Arbroath

Vessel	Length (m)	Average Days Fishing per Year	Typical Distance Steamed per Trip (NM)
Vessel AB	9	250	25
Vessel AC	9.8	350	14
Vessel AD	8.75	220	10
Vessel AE	7.33	350	13.5
Vessel AF	8.2	340	10
Vessel AG	9.9	310	20-50
Vessel AH	8.25	310	25
Vessel AI	6.9	250	15
Vessel AJ	7.39	300	10

There are two nephrops vessels based in Arbroath, Vessel AK and Vessel AL, whose specifications are provided in Table 11-12 and Table 11-13 below. These vessels generally target fishing grounds in the vicinity of their home port, although they may on occasion target grounds further afield. Activity is year round but, as with potting, weather dependent.

Table 11-12 Vessel and Gear Specifications, and Fishing Practices of Vessel AK

Fishing Vessel	Vessel AK
Home Port	Arbroath
Length	11.98 metres
Main Engine Power	300hp
Fishing Association	FMA
Typical Fishing Trip Duration	5 days
Seasonality of Activity	6 months nephrops 6 months squid
Average no. of Days Fishing per Year	200 days per year
Days at Sea Allocation	200 days per year
Seasonality of Fishing Method	12 months
Trawl Door Weight (per door)	0.25 tonnes
Distance between Doors under Normal Towing Conditions	35 metres
Ground Line Type	Soft ground – nephrops Rockhopper – hard ground
Estimated Headline Height of Net	2 metres – nephrops 3 metres – squid

Table 11-13 Vessel and Gear Specifications, and Fishing Practices of Vessel AL

Fishing Vessel	Vessel AL
Home Port	Montrose
Length	14.7 m
Main Engine Power	300hp
Fishing Association	N/A
Typical Fishing Trip Duration	10 days
Typical Distance Steamed per Trip	20-50 NM
Seasonality of Activity	8 months nephrops 4 months squid
Average no. of Days Fishing per Year	200 days per year
Days at Sea Allocation	200 days per year
Seasonality of Fishing Method	12 months
Trawl Door Weight (per door)	0.25 tonnes
Distance between Doors under Normal Towing Conditions	40 metres
Ground Line Type	Soft ground – nephrops Rockhopper – hard ground
Estimated Headline Height of Net	2 metres – nephrops 3 metres – squid

Several scallop vessels from ports further north, such as Stonehaven and Gourdon, seasonally fish in areas around the Bell Rock (scallop fishing vessels started to target grounds around the Bell Rock about five years ago) and Scalp Head. As has been previously stated, scallop fishing is cyclical; vessels will fish an area hard and then leave the ground for a period of 18 months or so before returning (pers. comm. Aberdeen District Fishery Office, October 2010). Exact vessel numbers vary year on year. Table 11-14 below gives the details of Vessel AM, a scalloper from Gourdon. It should be noted that the vessel is multi-purpose and is able to also target nephrops and squid using the appropriate trawl gear.

Table 11-14 Vessel and Gear Specifications, and Fishing Practices of Vessel AM

Fishing Vessel	Vessel AM
Home Port	Gourdon
Length	13.6 metres
Main Engine Power	310hp
Fishing Association	Northern FPO
Typical Fishing Trip Duration	36-40 hours if weather permits
Typical Distance Steamed per Trip	Up to 90 NM
Seasonality of Activity	12 months – scallops 3 months – nephrops 4 months – squid
Average no. of Days Fishing per Year	150-200 days per year
No. of beams per side	2
No. of Dredges per beam	6
Estimated Total Gear Width	11 m (beam end to end)
Average Towing Speed	2-2.8 knots
Average Towing Duration	1-2 hours
Average Tow Length	3-4 NM

11.2.1 Aberdeen District Vessels operating out of Anstruther District

On occasion certain vessels with home ports in the Aberdeen district may choose to temporarily base themselves at an Anstruther port (generally Pittenweem) in order to be closer to productive fishing grounds. Two vessels, listed in Table 11-15 below, were based in Pittenweem in 2010 and targeted the same grounds as the Anstruther fleet (see Figure 12.1 in Section 12.0). Both vessels are bottom otter trawlers, who will variously target nephrops and, when present, squid.

Table 11-15 Vessels administrated in the Aberdeen District and Seasonally Resident in Anstruther

Vessel	Home Port	Fishing Method	Vessel Length (m)
Vessel AN	Arbroath	Bottom otter trawl	18.47
Vessel AL	Gourdon	Bottom otter trawl	14.96

11.3 Eyemouth Fishery District

Consultation with fishermen and their representatives in the Eyemouth district identified that the majority of fishing vessels in this area did not undertake regular commercial fishing activities in the proposed development, although the export cable route passes through nephrops fishing grounds targeted by the demersal trawl fleet.

As is the case with several vessels from the Aberdeen District however, some vessels with home ports in the Eyemouth district may choose to temporarily base themselves at an Anstruther port (generally Pittenweem) in order to be closer to productive fishing grounds. This is further discussed in Section 11.3.1.

Provided below is a summary of activity by vessels in the Eyemouth fleet. It is of note that the activities of vessels from this area are of relevance to the export cable route options under consideration for the proposed development.

The principal Fishermen’s Associations in the district are the Anglo Scottish Fishermen’s Association (ASFA), which represents approximately half the vessels in the district, and the Cockenzie and Port Seton Fishermen’s Association (C&PSFA).

The Eyemouth district fleet is predominantly comprised of demersal trawlers targeting nephrops. The principal ports are Eyemouth, which has around 20 demersal trawlers, and Port Seton, which has 12 demersal trawlers. There are also 5/6 nephrops trawlers operating out of Dunbar (pers. comm. Cockenzie and Port Seton FA, December 2010). Demersal trawl vessels principally target nephrops grounds in the south of the regional study area on a year round basis although they are reported, to move into grounds further north and in closer proximity to the proposed development on a seasonal basis, when the fishing is reported to be good (pers. comm. Cockenzie and Port Seton FA, December 2010).

Demersal trawl vessels are also able to target squid on a seasonal basis, in the same way as other vessels of this category from Anstruther.

Provided below are the specifications of a twin rig nephrops trawling vessel, based in Dunbar:

Table 11-16 Vessel and Gear Specifications, and Fishing Practices of Vessel AO

Fishing Vessel	Vessel AO
Home Port	Dunbar
Length	13.1 m
Main Engine Power	201hp
Fishing Association	Eyemouth and District Association
Typical Fishing Trip Duration	14 hours
Typical Distance Steamed per Trip	20 NM
Seasonality of Activity	8 months nephrops and whitefish 4 months squid
Average no. of Days Fishing per Year	200 days per year
Days at Sea Allocation	200 days per year
Seasonality of Fishing Method	12 months
Trawl Door Weight (per door)	0.14 tonnes
Distance between Doors under Normal Towing Conditions	60 metres
Estimated Headline Height of Net	1 metre – nephrops 2 metres – squid 6 metres - whitefish

There is one known scallop vessel operating out of Seahouses, Vessel AP, less than 10 metres in length. The vessel undertakes trips on average of 30 NM round trip. As a result, it is not considered that the vessel will be active in grounds around the proposed development.

Creel fishing is of less importance in the district, although there are a number of small, inshore vessels around North Berwick and particularly between Eyemouth and the border. Grounds are generally within several miles of the coast (a number of vessels will operate on a part time basis). Several of the larger vessels have however stated they target deeper water grounds up to 20-25 miles offshore.

The Fleet Resilience Scheme⁴ has to date affected three vessels in the area, with one from Eyemouth ceasing to fish, and two others planning to decommission.

There is a transient English fleet from the north-east (Blyth, North Shields, etc). These vessels travel as far north as Port Seton and Anstruther in the summer months. In addition, there are occasional visiting boats, scallopers and nephrops trawlers, from the west coast.

⁴ Fleet Resilience Scheme explained in Section 4.1

11.3.1 Eyemouth based Vessels operating out of Anstruther District

As has been previously stated, fishermen may choose to operate for a period out of ports closer to productive fishing grounds. The principal factor in determining this is the availability of target species, and will vary year on year. An example of this, Vessel AQ (Table 11-17), berthed in Pittenweem in 2010 and targeted grounds in the area of the proposed development.

Table 11-17 Vessels Administrated in the Eyemouth District and Seasonally Resident in Anstruther

Vessel	Home Port	Fishing Method	Vessel Length (m)
Vessel AQ	Eyemouth	Bottom otter trawl	11.8

11.4 Visiting Vessels

The regional study area is seasonally visited by vessels from home ports outside of the Aberdeen, Anstruther or Eyemouth districts.

11.4.1 Demersal Trawl Vessels

In addition to the demersal trawl vessels from the Anstruther district, and visiting vessels from the Eyemouth and Aberdeen districts described above, additional boats may spend several months fishing the area, berthing at a local port and selling catch to local buyers. Vessels visit from the north-east of England, the north-east of Scotland and the west coast.

Vessels targeting nephrops start arriving in mid-June and may stay until the end of December. These vessels are also able to transfer to fishing squid when they appear, generally between August and September, and may be additionally joined by several larger category vessels seeking to capitalise on this unregulated fishery.

Table 11-18 below provides the basic vessel specifications of two vessels currently operating on a seasonal basis out of in Pittenweem in 2010, and target fishing grounds in the vicinity of the proposed development.

Table 11-18 Visiting Vessels to the Anstruther District

Vessel	Home Port	Fishing Method	Vessel Length (m)
Vessel AR	Oban	Twin rig demersal trawler	12.88
Vessel AS	Macduff	Single net demersal trawler	13.9

11.4.2 Scallop Vessels

Scallop vessels are the most nomadic in the Scottish fleet, variously targeting fishing grounds around the UK coast. Vessels will unload catch and berth in ports within reasonable steaming distance from the fishing grounds they are targeting.

The number of visiting scallop vessels, as with the demersal trawl fleet, depends upon the availability of productive fishing grounds elsewhere. Furthermore, the time each vessel spends in the area also varies, for example, an individual may focus 80% of their total fishing time in the Forth and Tay area, and another boat only 10%. Generally, however, the largest vessels in the fleet, those between 25 and 30 metres in length and towing between 16 and 20 dredges per side, primarily work grounds in the English Channel (pers. comm. scallop fisherman, December 2010).

Vessel AT, based in Peterhead, seasonally fishes scallop grounds in the Tay area. The vessel is 21 metres in length and operates ten bags a side. 70% of its fishing time is spent targeting grounds

between Montrose and the north of the Tay (pers. comm., scallop fisherman, December 2010). Additional scallop vessels from the east and west coast will also seasonally fish the area, although, as stated, numbers will vary annually.

Although the scallop fishery is not at present restricted by quota or effort limits, additional constraints are having an increasing impact on the fleet. Closure of fishing grounds in Cardigan Bay, previously an important scallop fishing ground, has displaced activity and increased pressure on other areas. In addition, restrictions imposed upon the Scottish fleet in the Isle of Man, another important fishing ground, have added further pressure upon remaining grounds.

12.0 Fishing Grounds

The charts overleaf have been collated using information provided by individual fishermen and their representatives. It should be noted that fishing grounds have been identified on paper charts by hand, and inasmuch may not represent the detailed locations of the various fishing activities.

12.1 Nephrops Fishing Grounds

Figure 12.1 shows the principal nephrops grounds in the Firth of Forth area. It can be seen that the majority of grounds are inshore in the Firth of Forth, to the south of the proposed development, as well as off Arbroath.

The export cable route passes through nephrops grounds targeted by both the Anstruther and Eyemouth fleets.

12.2 Squid Fishing Grounds

Fishermen targeting squid in the Forth and Tay area stated that the species were caught in a variety of locations. In addition, fishermen stated they are catching squid in new grounds. The grounds identified in Figure 12.2 are therefore considered to be squid fishing areas, and not discrete grounds. These include both the proposed development and the export cable route.

12.3 Scallop Fishing Grounds

Figure 12.3 shows the location of scallop grounds relative to the proposed development, as provided by two individual vessels.

Scallop grounds are predominantly located to the north and east of the proposed development, with a small proportion overlaying the northern section of the area. There is no scallop dredging over the export cable route.

12.4 Creel Fishing Grounds

Figure 12.4 shows the principal creel fishing grounds for vessels in the Aberdeen, Anstruther and Eyemouth districts. It can be seen that, for the most part, grounds are inshore, largely as a result of the limited operational range of the vessels involved and the avoidance of towed gear grounds in areas further offshore. The Bell Rock is however considered to be an important creel area.

There is limited creel activity along the inshore section of the cable route.

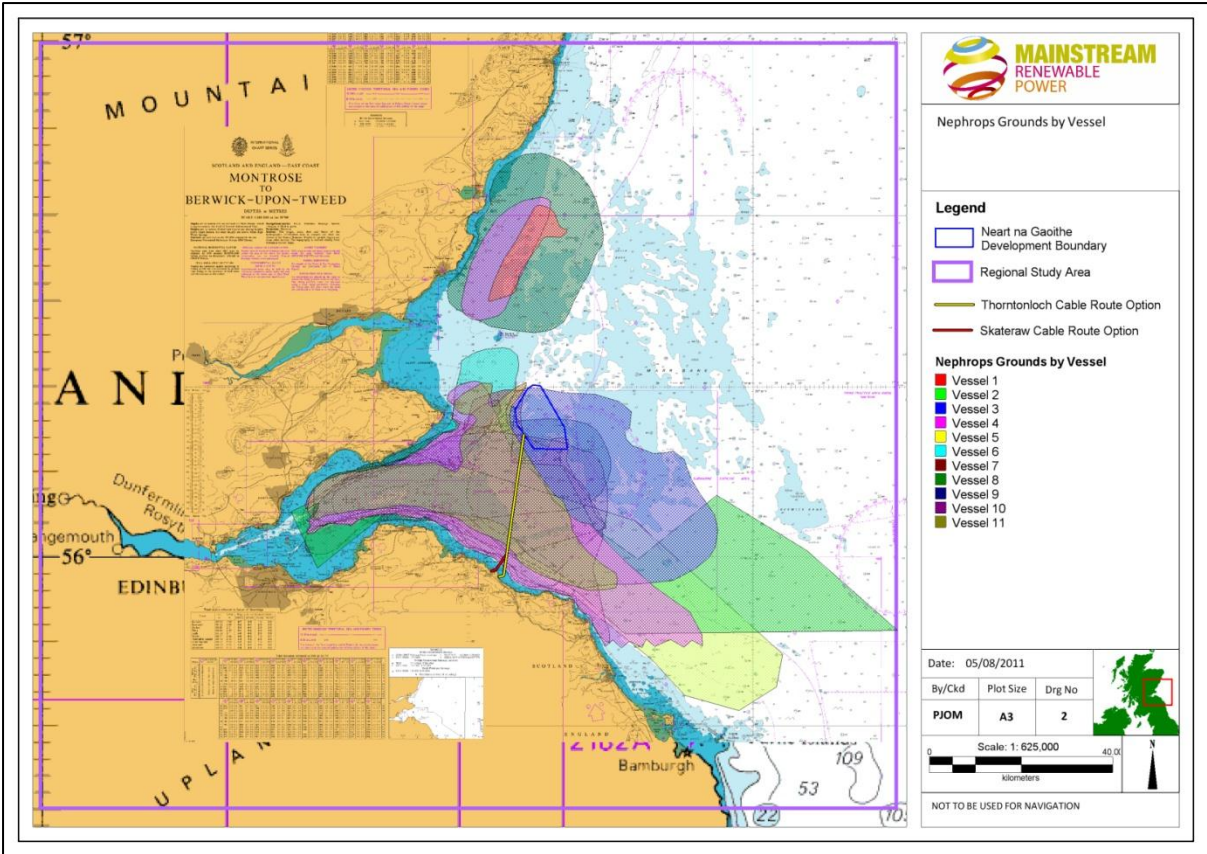


Figure 12.1 Nephrops Grounds

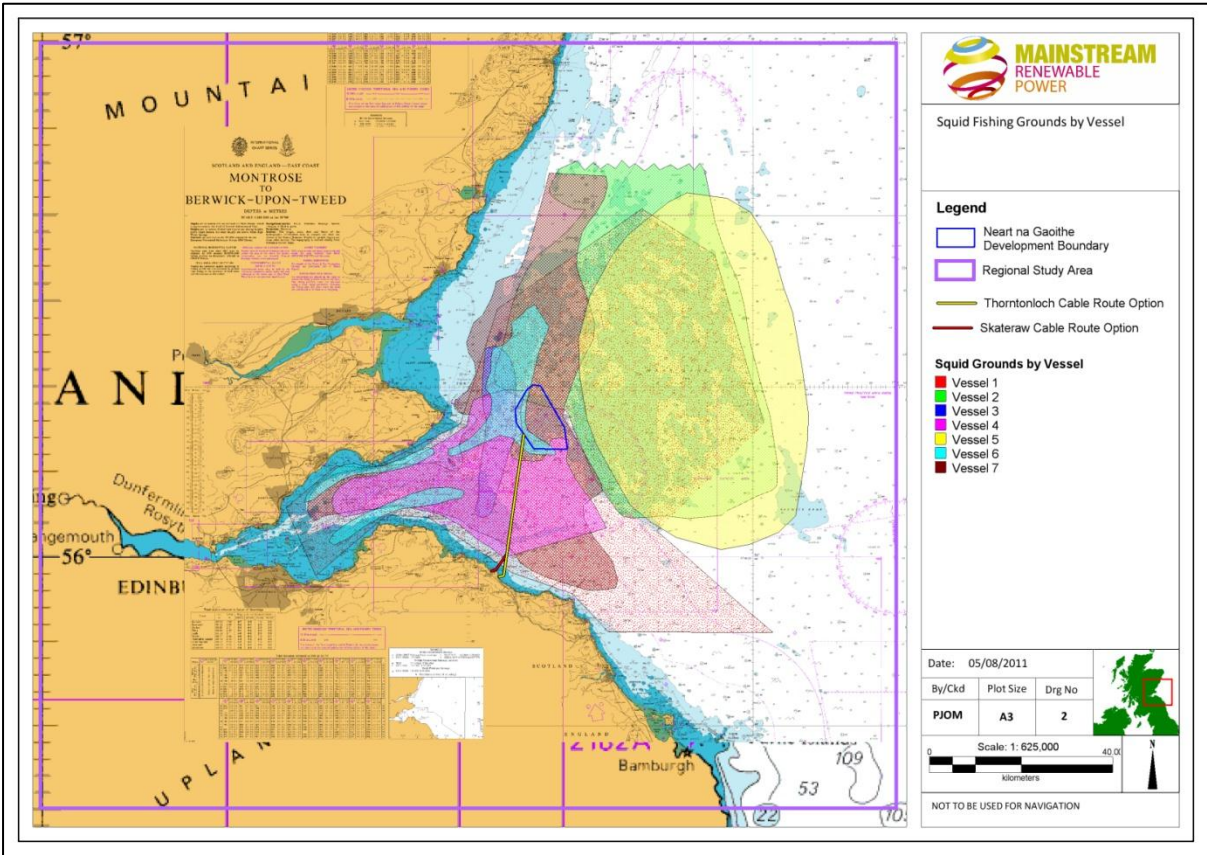


Figure 12.2 Squid Fishing Grounds

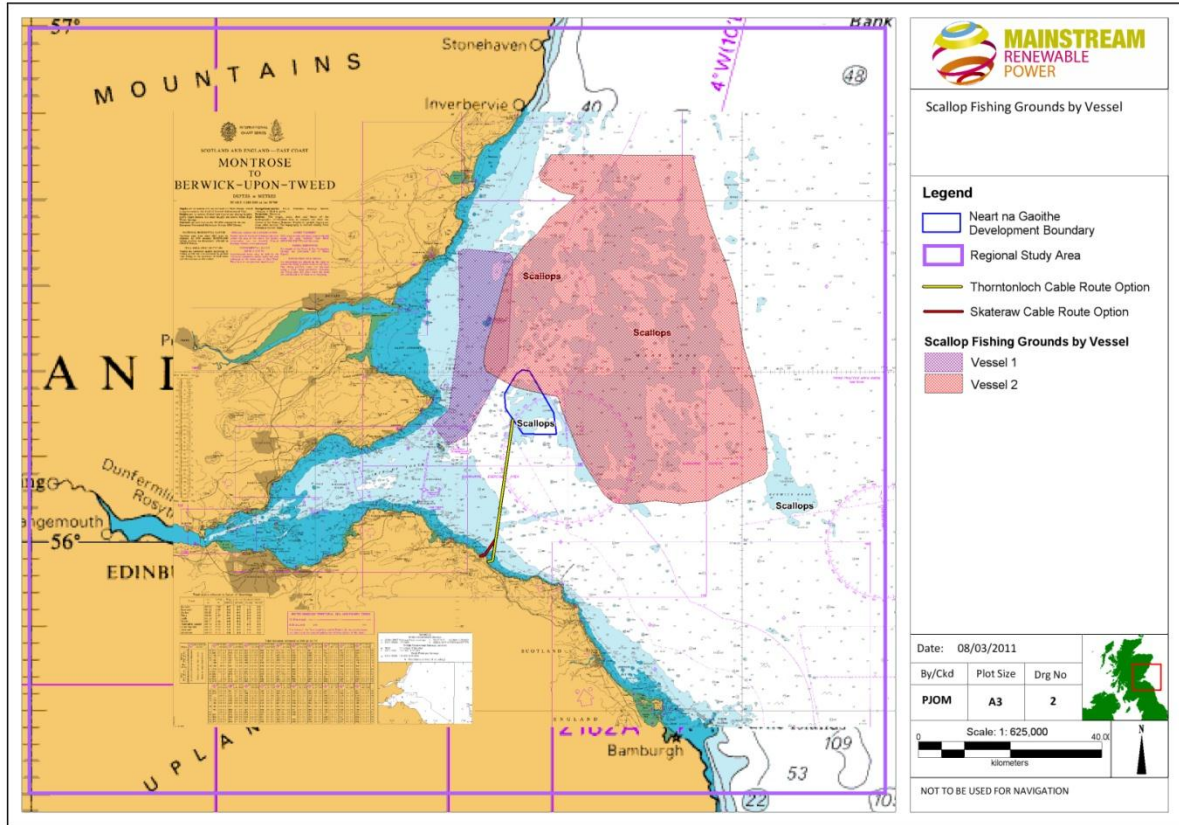


Figure 12.3 Scallop Fishing Grounds

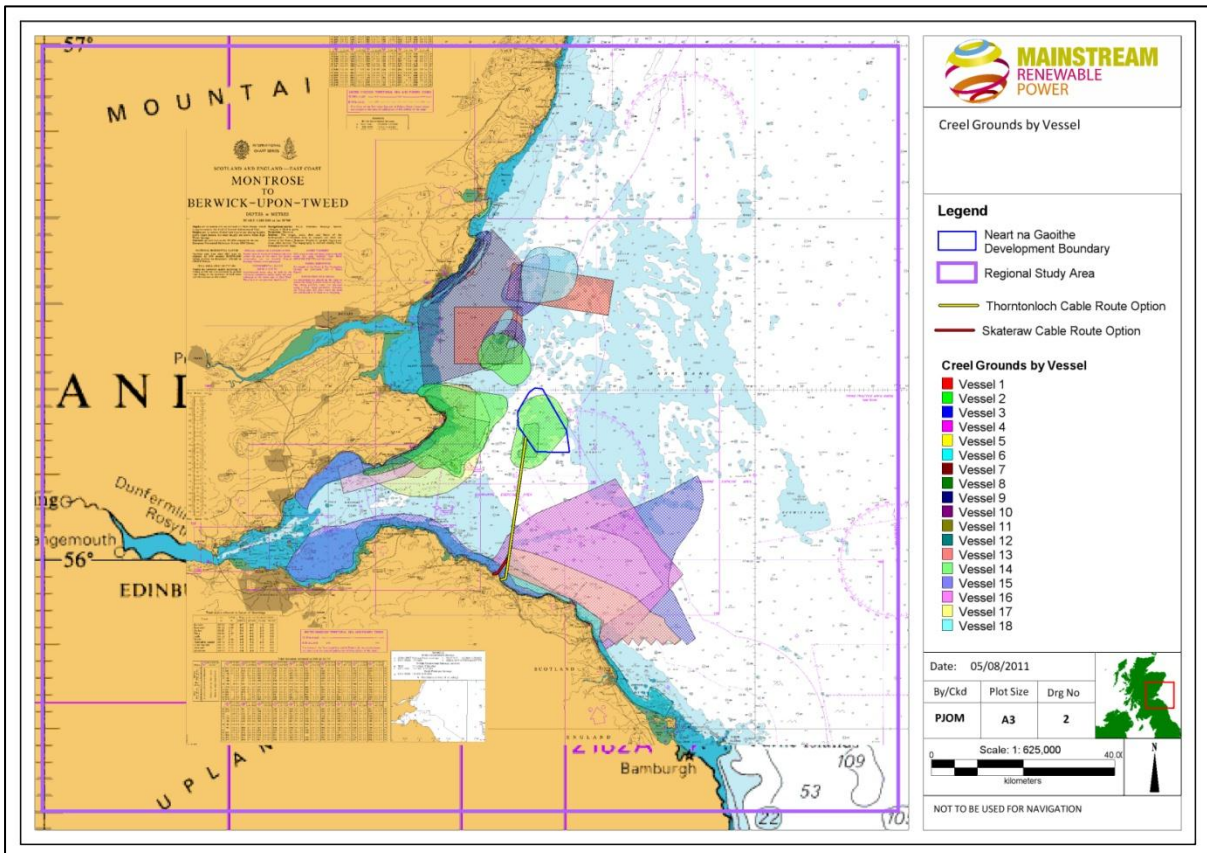


Figure 12.4 Principal Creel Fishing Grounds

12.5 Changes in Fishing Grounds

Figure 12-4 below shows changes in fishing grounds over the last 60 years as identified by one vessel targeting species in the Forth and Tay area. It can be seen that between 1950 and 1980, the vessel would target nephrops in discrete sea areas for seven months of the year (June to December); however in 2007 the vessel was targeting nephrops in a larger area all year round. As whitefish stocks declined and restrictions on fishing for whitefish increased, the vessel became more dependent on nephrops fishing. The vessel also diversified in 2007 and began targeting squid. As mentioned previously, squid are an increasingly important species in the Forth and Tay area due to increasing restrictions on pressure stocks such as whitefish and nephrops.

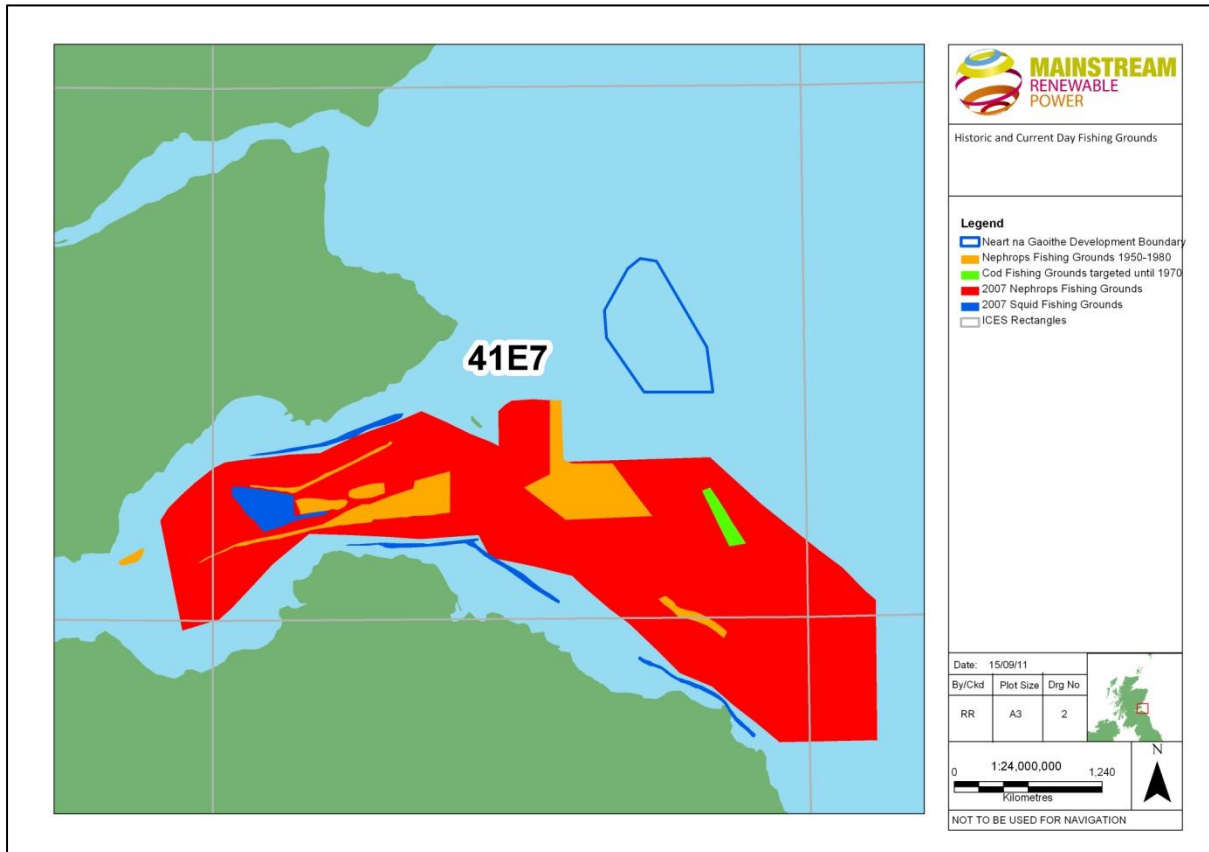


Figure 12.4 Historic and current day fishing grounds as identified by one vessel in the Forth and Tay area

13.0 Future Fisheries

Commercial fishing activities are not constant; there are fluctuations in patterns of activity both on an annual as well as on a longer term basis. Inasmuch, a prediction of future activities is complicated and potentially misrepresentative. A short summary of potential changes to the current fishing baseline identified above that may occur in the future is provided below.

13.1 Nephrops Fishery

The nephrops fishery in the Forth and Tay area is considered to be sustainably exploited at current levels and significant changes to the activity of the fleet are not expected in the future.

As has been previously stated all demersal trawl vessels operating in the Forth and Tay area target nephrops year round and squid on a seasonal basis. These vessels are however able to also target whitefish although a current lack of available quota, coupled with a collapse in the fishery in the area has curtailed this activity. It is possible that stocks of whitefish may recover and, subject to having access to the species, vessels may target this fishery in the future.

13.2 Scallop Fishery

As scallop stocks in Forth and Tay area are currently considered to be exploited unsustainably (Howell *et al.*, 2003), 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 future (Keltz and Bailey, 2010). As has been previously stated, the Isle of Man has already introduced fishing restrictions to protect stocks. In addition, concerns over the impact of scallop dredging upon the environment have resulted in restricted or no access to sea areas, such as has occurred in Cardigan Bay. It is possible and indeed likely, in light of the commitments to increased protection of marine habitats through the establishment of Marine Protected Areas (MPAs), that further restrictions will apply to the fishery as it exists in its current form.

13.3 Squid Fishery

The squid fishery is a relatively new one to the Forth and Tay area, and future fishing practices are uncertain. It has however become an important alternative fishery to the nephrops fleet and it is likely, in the light of increasing restrictions on pressure stock species such as whitefish and nephrops, that it will be increasingly important in the future.

Due to the erratic behaviour of squid stocks and their high sensitivity to environmental change, it is not currently possible to predict future squid stocks. It also means that current issues such as climate change (which could result in rises in sea temperature and a general rise in carbon dioxide concentrations) could lead to a change in squid distribution as they retreat to higher latitudes to avoid the advance of warm water (Hastie *et al.*, 2009). It is also difficult to predict the seasonality of squid stocks. Currently, the fishing season for squid is beginning earlier and finishing later. This is potentially unsustainable, as entering the squid fishery too soon could lead to an early depletion of the stocks. The ability of the stock to withstand increased levels of exploitation is uncertain, which could potentially affect the viability of the fishery in the future.

13.4 Bivalve Fisheries

There is currently a small bivalve fishery in the Anstruther district, targeted by one vessel. There are however productive bivalve grounds in several inshore areas, such as Kinshaldy beach, Kirkcaldy Bay and St Andrews Bay, although commercial fishing activities are currently prohibited. At the time of writing a bi-valve survey was being undertaken in St Andrews Bay, aimed at assessing population densities of bi-valve species (pers. comm. IFG co-ordinator, February 2011). It is possible that in the

future restrictions upon the prosecution of this fishery may be lifted, subject to an assessment upon the sustainability of stocks being undertaken.

13.5 Sprat Fishery

Sprats were traditionally targeted in the Inner Forth, where the species over-wintered. There was a thriving fishery about 20 years ago, with an estimated 100 vessels targeting the fishery. Concerns about the level of juvenile herring bi-catch led to the closure of the fishery. It is however believed that it is only when the sprat move into the outer Firth (generally around February) that the species mixes with herring stocks. The South East IFG has proposed to survey the inner Forth over winter to identify clean sprat that are of a size suitable for human consumption, which if successful may lead to the identification of a small scale fishery in the future (pers. comm. IFG coordinator, February 2011).

13.6 Sandeel Fishery

The Danish fleet catches more than 90% of the TAC for the species in the North Sea, with a relatively very low level of quota apportioned to the UK. There has historically been an industrial⁵ trawl fishery for sandeel on the Wee Bankie in the Firth of Forth, targeted in the main by the Danish fleet out of Esberg. There is no historic access for the Danish fleet to waters between 6 NM and the 12 NM limit and activity was therefore restricted to outside of 12 NM.

Sandeels are a key component of the marine food web, providing food for seabirds, fish species and marine mammals. The collapse of this stock was thought to be a major factor in the breeding failure of seabirds along the UK's North Sea coast in 2004. Subsequent to this, the fishery was subject to quota reductions and closure of fishing grounds.

Sandeel fishing grounds on the east coast of Scotland, including the Wee Bankie, were closed to industrial trawling in 2000 as a result of concerns about stock populations. Whilst some scientific surveying has been undertaken by the Danes, recorded levels of catch have not met requirements for the reopening of the fishery and there is still a moratorium on trawling for sandeels on the Wee Bankie. Vessels target sandbanks elsewhere in the North Sea, such as the Dogger Bank.

It is possible that the species may recover to sufficient levels for the fishery may reopen in the future and the Danes regain access to the Wee Bankie to target the species.

⁵ An industrial trawl fishery is defined by ICES as those fisheries whose ultimate product are principally fish meal and fish oil.

14.0 References

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