

# Inch Cape Offshore Wind Farm

New Energy for Scotland

Offshore Environmental Statement:

**VOLUME 2G**

**Appendix 18B: Commercial Fisheries  
Baseline Offshore Export Cable  
Corridor**



# Inch Cape Offshore Wind Farm

## Appendix 18B: Commercial Fisheries Baseline Offshore Export Cable Corridor

Brown & May Marine Ltd  
Progress Way  
Mid Suffolk Business Park  
Eye  
Suffolk  
IP23 7HU  
Tel: 01379 870181  
Fax: 01379 870673  
Email: [marine@brownmay.com](mailto:marine@brownmay.com)

Reference	Issue Date	Issue Type	Author	Checked	Approved
BMMCFEER-IC	24/10/12	FINAL	RR	JL	JH-M
BMMCFEER-IC	4/12/2012	FINAL	RR	JH-M	JH-M
BMMCFEER-IC	18/12/2012	FINAL	RR	JH-M	JH-M

## Contents

<b>List of Tables</b> .....	<b>iii</b>
<b>List of Figures</b> .....	<b>iv</b>
<b>Glossary of Terms</b> .....	<b>v</b>
<b>Abbreviations and Acronyms</b> .....	<b>vi</b>
<b>18B.1 Introduction</b> .....	<b>1</b>
<b>18B.2 Study Area</b> .....	<b>1</b>
<b>18B.3 Marine Management Organisation (MMO) Fisheries Statistics</b> .....	<b>3</b>
18B.3.1 Annual Variation .....	7
18B.3.2 Seasonality.....	13
18B.3.3 Landings Values by Port.....	19
<b>18B.4 Satellite Tracking</b> .....	<b>21</b>
18B.4.1 2007 to 2010 Data .....	21
18B.4.2 2009 Data.....	21
<b>18B.5 Marine Scotland Data Analysis</b> .....	<b>27</b>
<b>18B.6 Fishing Vessels, Patterns and Practices</b> .....	<b>32</b>
18B.6.1 Nephrops .....	32
18B.6.2 Crab and Lobster.....	34
18B.6.3 Scallops .....	35
18B.6.4 Squid .....	37
18B.6.5 Clams .....	37
<b>18B.7 Fishing Grounds</b> .....	<b>38</b>
18B.7.1 Nephrops Fishing Grounds .....	38
18B.7.2 Crab and Lobster Fishing Grounds.....	38
18B.7.3 Scallop Fishing Grounds.....	38
18B.7.4 Squid Fishing Grounds .....	38
<b>18B.8 Future Fisheries</b> .....	<b>43</b>
18B.8.1 Nephrops Fishery.....	43
18B.8.2 Crab and Lobster Fishery .....	43
18B.8.3 Scallop Fishery .....	43
18B.8.4 Squid Fishery.....	44
<b>References</b> .....	<b>45</b>

## List of Tables

Table 18B.1 Top 10 Ports by Landings Values from ICES Rectangle 40E7 (Source: MMO) .....	19
Table 18B.2 Top 10 Ports by Landings Values from ICES Rectangle 41E6 (Source: MMO) .....	20
Table 18B.3 Top 10 Ports by Landings Values from ICES Rectangle 41E7 (Source: MMO) .....	20
Table 18B.4 Vessels Reported to Target Nephrops in the Vicinity of the Offshore Export Cable Corridor.....	33
Table 18B.5 Specifications of Vessel C, a Pittenweem Trawler .....	33
Table 18B.6 Visiting Vessels Reported to Target Nephrops in the Forth and Tay Area.....	34
Table 18B.7 Vessels Reported to Target Crab and Lobster Grounds in the Vicinity of the Offshore Export Cable Corridor.....	35
Table 18B.8 Specifications of Vessel CQ, a Pittenweem Creeler .....	35
Table 18B.9 Vessels Reported to Target Scallops in the Forth and Tay Area .....	36
Table 18B.10 Specifications of Vessel A, a Montrose Scallop Dredger.....	36
Table 18B.11 Specifications of Vessel I, a Buckie Scallop Dredger .....	37

## List of Figures

Figure 18B.1 Study Area.....	2
Figure 18B.2 Landings Values by Species (Average 2001-2010) in the Study Area (Source: MMO) .....	4
Figure 18B.3 Landings Values by Method (Average 2001-2010) in the Study Area (Source: MMO) .....	5
Figure 18B.4 Landings Values by Vessel Category (Average 2001-2010) in the Study Area (Source: MMO).....	6
Figure 18B.5 Annual Variations in Landings Values of Nephrops in the Study Area (Source: MMO) ....	8
Figure 18B.6 Annual Variations in Landings Values of Crustaceans (Lobster, Edible Crab and Velvet Crab) in the Study Area (Source: MMO) .....	9
Figure 18B.7 Annual Variations in Landings Values of Scallops in the Study Area (Source: MMO) .....	10
Figure 18B.8 Annual Variations in Landings Values of Squid in the Study Area (Source: MMO) .....	11
Figure 18B.9 Annual Variations in Landings Values of Clams (Razor and Surf Clams) in the Study Area (Source: MMO).....	12
Figure 18B.10 Average Annual (2001-2010) Seasonality of Nephrops (Source: MMO).....	14
Figure 18B.11 Average Annual (2001-2010) Seasonality of Crustaceans (Lobsters, Edible Crabs and Velvet Crabs) (Source: MMO) .....	15
Figure 18B.12 Average Annual (2001-2010) Seasonality of Scallops (Source: MMO).....	16
Figure 18B.13 Average Annual (2001-2010) Seasonality of Squid (Source: MMO).....	17
Figure 18B.14 Average Annual (2001-2010) Seasonality of Clams (Surf and Razor Clams) (Source: MMO).....	18
Figure 18B.15 VMS Density by Value (Average 2007-2010) in the Regional Study Area (Source: MMO) .....	22
Figure 18B.16 VMS Density by Effort (Days; Average 2007-2010) in the Regional Study Area (Source: MMO).....	23
Figure 18B.17 Satellite (VMS) Density of All UK Over-15 Metre Vessels in 2009.....	24
Figure 18B.18 Satellite (VMS) Density of UK Over-15 Metre Vessels in 2009, Nephrops Gear Only ...	25
Figure 18B.19 Satellite (VMS) Density of UK Over-15 Metre Vessels in 2009, Scallop Dredge Gear Only .....	26
Figure 18B.20 Distribution of Nephrops by Value (Average 2007 to 2011) in the Export Cable Study Area (Source: Marine Scotland, 2012) .....	28
Figure 18B.21 Distribution of Scallops by Value (Average 2007 to 2011) in the Export Cable Study Area (Source: Marine Scotland, 2012) .....	29
Figure 18B.22 Distribution of Squid by Value (Average 2007 to 2011) in the Export Cable Study Area (Source: Marine Scotland, 2012) .....	30
Figure 18B.23 Distribution of Demersal Landings by Value (Average 2007 to 2011) in the Export Cable Study Area (Source: Marine Scotland, 2012).....	31
Figure 18B.24 Forth and Tay Nephrops Fishing Grounds .....	39
Figure 18B.25 Forth and Tay Creel Fishing Grounds.....	40
Figure 18B.26 Forth and Tay Scallop Fishing Grounds.....	41
Figure 18B.27 Forth and Tay Squid Fishing Areas.....	42

## Glossary of Terms

<b>12 nm limit</b>	Territorial waters of EU Member States extend to 12 nm. Member States manage these waters exclusively within these limits
<b>6 nm-12 nm limit</b>	Some access to certain EU Member States in identified areas around the UK coast, based upon historic access
<b>6 nm limit</b>	Exclusive access to UK vessels only within 6 nm
<b>Under-10 metre</b>	Category of fishing vessels that are less than 10 metres in length
<b>10 - 15 metre</b>	Category of fishing vessels that are between 10 and 15 metres in length
<b>Over-15 metres</b>	Category of fishing vessels that are greater than 15 metres in length
<b>Creeling</b>	The Scottish designation for potting
<b>Demersal</b>	Activities or species located near or on the sea bed
<b>Pelagic</b>	Activities or species located in the water column
<b>Quota</b>	A measure of the quantity of a species that can legally be landed within a set period

## Abbreviations and Acronyms

<b>BMM</b>	Brown and May Marine Limited
<b>EC</b>	European Commission
<b>EU</b>	European Union
<b>Hp</b>	Horsepower
<b>ICES</b>	International Council for the Exploration of the Sea
<b>MMO</b>	Marine Management Organisation
<b>NM</b>	nautical mile
<b>VMS</b>	Vessel Monitoring System (satellite tracking data)

## 18B.1 Introduction

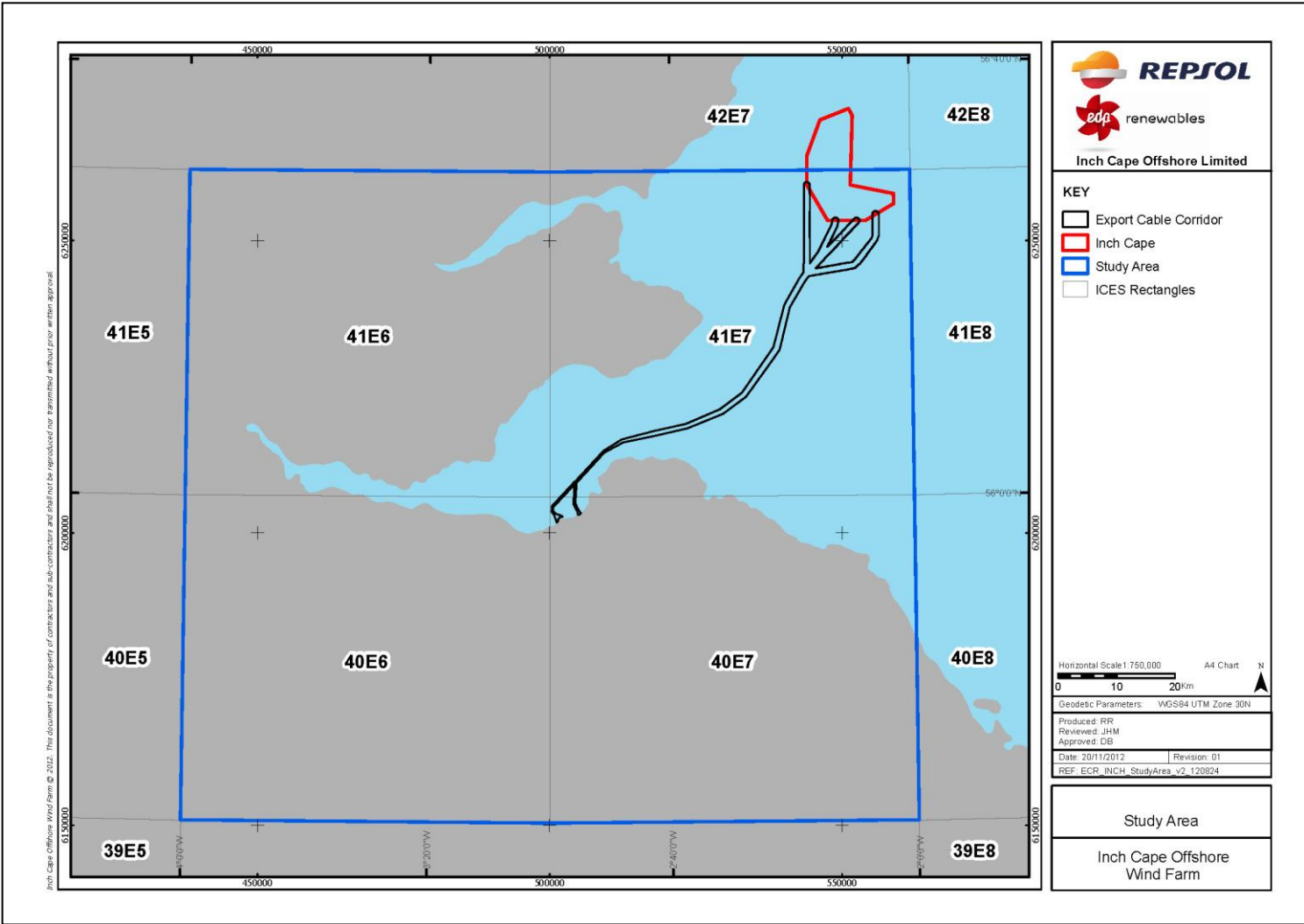
This technical report presents the commercial fisheries Inch Cape offshore export cable corridor baseline. For the purpose of this study, commercial fishing is defined as any legal fishing activity undertaken for declared taxable profit.

This report is intended to accompany *Appendix 18A (Commercial Fisheries Baseline Development Area)* and support *Chapter 18 (Commercial Fisheries)*.

## 18B.2 Study Area

The study area for the assessment of commercial fishing intensity and values with regards to the offshore export cable corridor is shown in Figure 18B.1 below. The approach has been to define a study area comprising four ICES (International Council for the Exploration of the Sea) rectangles (40E6, 40E7, 41E6 and 41E7), within which the offshore export cable corridor is located. This allows fishing grounds in the general area of the offshore export cable corridor to be described. An ICES rectangle is the smallest spatial unit available for the collation of fisheries statistics. It is important to note that the area of each rectangle in the study area is much larger than that covered by the offshore export cable corridor. In light of this the fishing activities along the offshore export cable corridor itself have also been described where possible.

Figure 18B.1 Study Area



### 18B.3 Marine Management Organisation (MMO) Fisheries Statistics

Figure 18B.2 and Figure 18B.3 show the landings values recorded in the study area of the Inch Cape offshore export cable corridor by species and methods, respectively. The offshore export cable corridor passes through rectangles which record landings of local importance for nephrops, crustaceans (including lobster, edible crabs and velvet crabs), scallops, squid and clams (surf and razor). It should be noted that no landings values have been recorded in ICES rectangle 40E6 over the ten year period due to the small sea area located within the rectangle.

Nephrops record the highest landings values for all species in rectangles 40E7 (73.8%, £1,006,713), 41E6 (87.8%, £704,121) and 41E7 (57.1%, £2,644,374). Nephrops are principally targeted by vessels operating bottom otter trawls and nephrops trawls (the same category of gear under different classification).

Lobster is the principal crustacean recorded in the area, although edible and velvet crabs also record significant landings values. The highest crustacean landings values are recorded in rectangle 41E7 (lobster – 22.9%, £1,059,710; edible crabs – 3.1%, £143,099; velvet crabs – 2.9%, £134,069), followed by rectangle 40E7 (lobster – 11.6%, £158,617; edible crabs – 3.4%, £46,249; velvet crabs – 1.4%, £18,543). Rectangle 41E6 records negligible landings values for edible and velvet crabs, although significant landings values for lobster are recorded in this rectangle (5.9%, £47,294). Crustaceans are targeted by vessels setting creels.

Landings of scallops, which are targeted by vessels operating boat dredges, record moderate values in the study area, with the highest landings values recorded in rectangle 41E7 (7.0%, £326,349), followed by 40E7 (3.8%, £52,035) and 41E6 (2.5%, £19,970).

Squid are principally landed in rectangles 41E7 (2.4%, £109,235) and 40E7 (2.2%, £30,177) with negligible values recorded in 41E6. Squid are primarily caught by bottom otter trawlers, which reconfigure their gear to target the species.

Surf and razor clams, principally targeted by vessels operating mechanized and boat dredges, account for a small proportion of the landings values recorded in rectangle 41E7 (surf clams – 2.2%, £100,816; razor clams – 1.6%, £73,591) with negligible values recorded in 40E7 and 41E6.

Figure 18B.4 shows the landings values recorded in the study area of the offshore export cable corridor by vessel category. A considerable proportion of vessels operating within the study area is under-15 metres in length, and hence will not be included in the VMS (Vessel Monitoring System) dataset. It should be noted however, that a percentage of vessels are over-15 metres in length, particularly in rectangles 40E7 and 41E7. As a result, these vessels will be tracked by VMS and their activity further detailed through the assessment of this dataset (*Section 18B.4*).

Figure 18B.2 Landings Values by Species (Average 2001-2010) in the Study Area (Source: MMO)

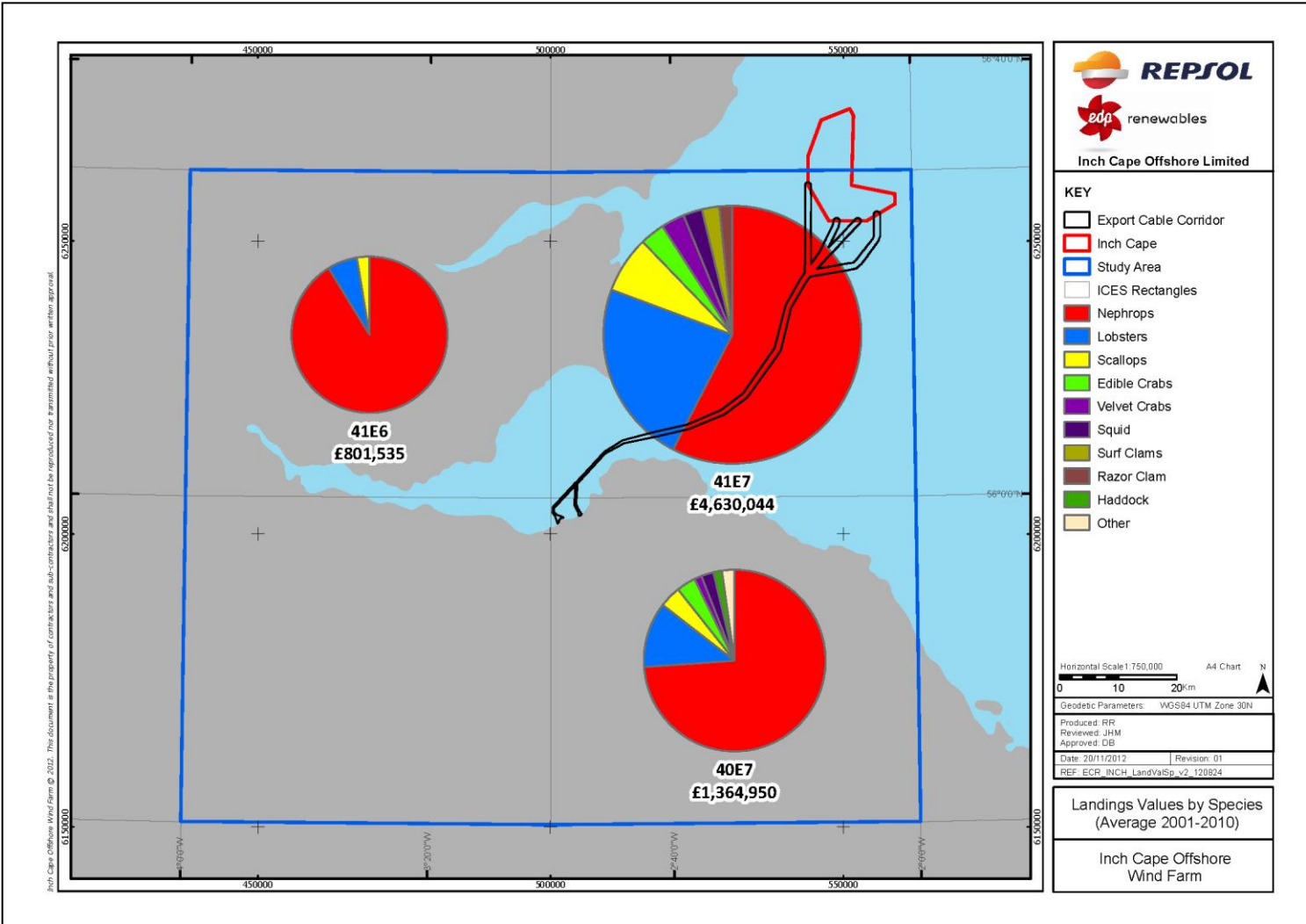


Figure 18B.3 Landings Values by Method (Average 2001-2010) in the Study Area (Source: MMO)

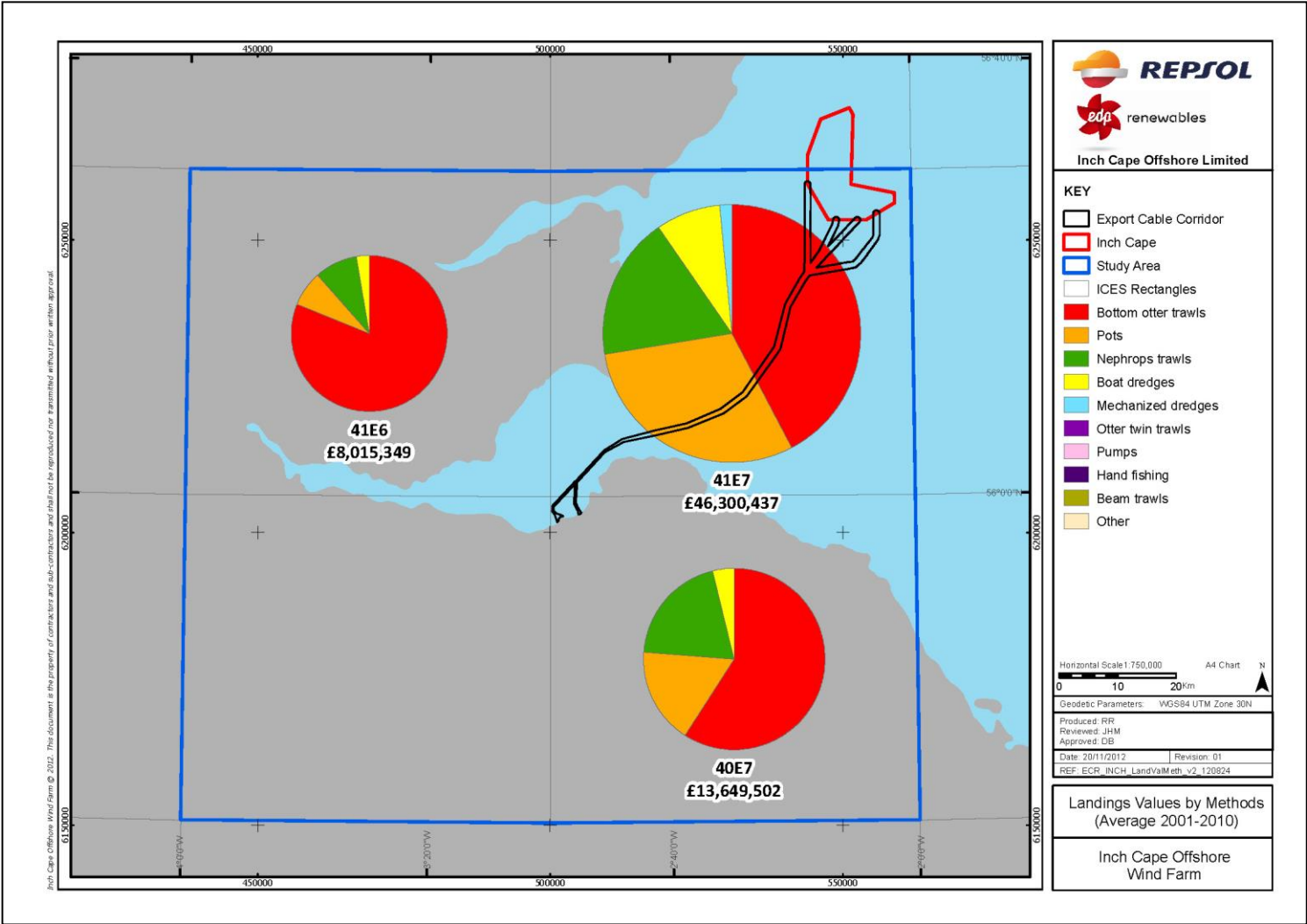
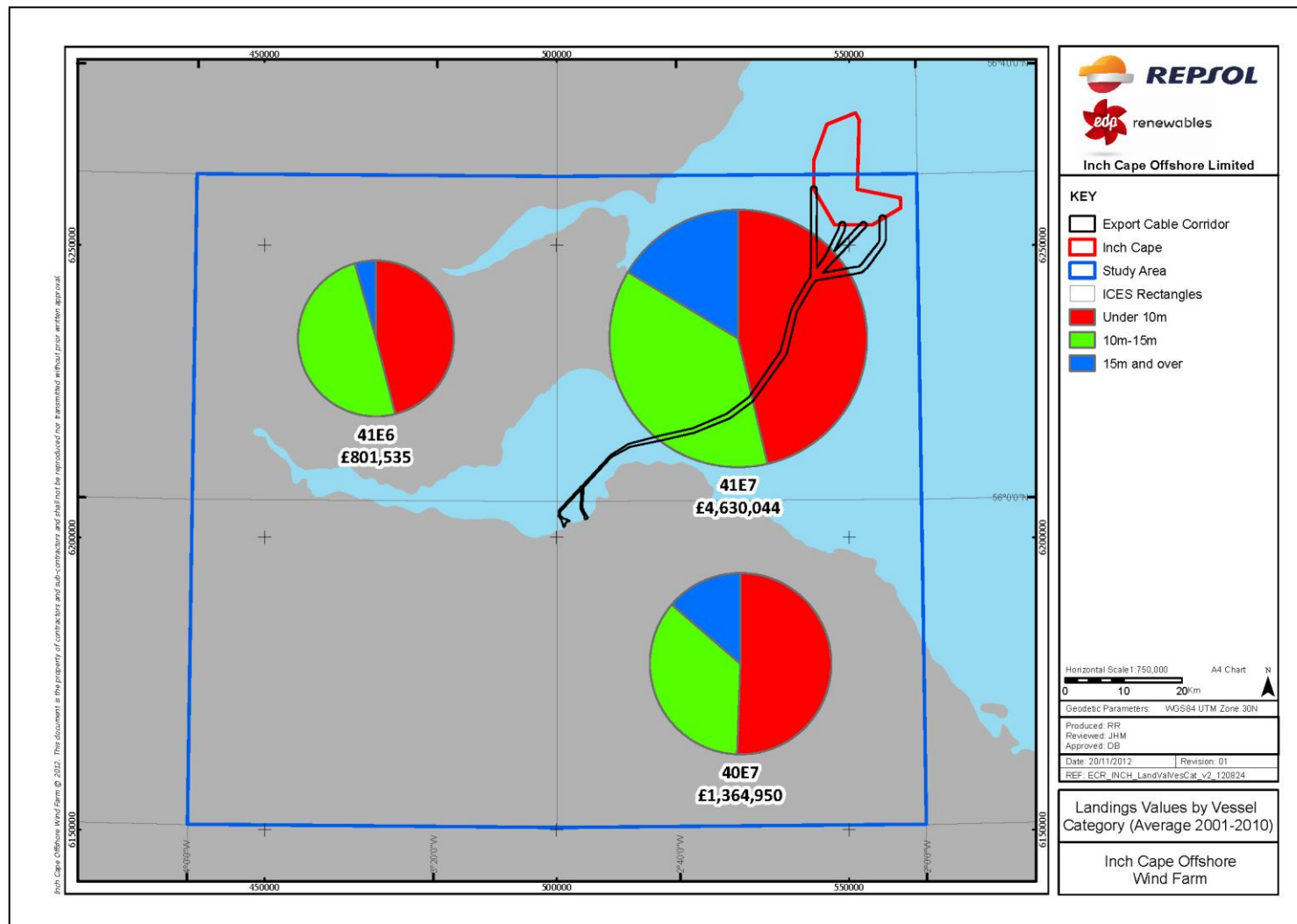


Figure 18B.4 Landings Values by Vessel Category (Average 2001-2010) in the Study Area (Source: MMO)



### 18B.3.1 Annual Variation

Figure 18B.5 to Figure 18B.9 show the annual variation in landings values of the most commercially important species targeted in the study area (three rectangles combined).

Figure 18B.5 shows the annual variation in landings values of nephrops in the study area. Landings values have fluctuated over the ten year period, being lower prior to 2004 and increasing up until 2007 (between £3,445,932 in 2004 and £6,265,810 in 2007). Landings values have declined in recent years (2008 to 2010), although have not reached the low levels recorded prior to 2005.

Figure 18B.6 shows the annual variation in landings values of the top three commercial species of crustaceans: lobster, edible crab and velvet crab. Landings values of all three species have generally increased over the ten year period. Relatively low values were recorded until 2005, increasing from £927,719 to £3,071,744 in 2009. Landings of lobsters record the highest values increasing from £656,146 in 2005 to £2,535,621 in 2009, with a slight decline in 2010 to £2,486,929. Landings of edible and velvet crabs increased over the ten year period, from £168,637 and £102,936 in 2005, respectively, to £287,741 and £275,214 in 2008, respectively. Since 2008 however, both species have seen a decline in landings values with £296,294 recorded for edible crabs and £156,251 for velvet crabs in 2010. It is considered that the general increase in landings of all three species post 2005 is likely attributable to improved recording of catches through the Shellfish Entitlement Scheme (2004) and the Registration of Buyers and Sellers (2005).

Figure 18B.7 shows the annual variation in landings values of scallops in the study area. Landings values have fluctuated over the ten year period, with relatively low values recorded between 2001 and 2006. Values peaked in 2007 (£1,210,130) declining to more moderate landings values between 2008 and 2010 (averaging approximately £660,000 each year).

Figure 18B.8 shows the annual variation in landings values of squid in the study area. Landings values have fluctuated greatly over the ten year period, with peaks in values recorded in 2007 (£498,942) and 2010 (£616,436) and relatively low landings values recorded for the remainder of the ten years. It should be noted that seasonal squid abundance in the Forth and Tay area is reported to be erratic, and furthermore, the number of vessels targeting squid stocks may vary, depending upon the availability of other, quota restricted species.

Figure 18B.9 shows the annual variation in landings values of the two most commercially important bivalve species: surf and razor clams. Based on analysis of the dataset and information gathered through consultation it is apparent that both fisheries are relatively recent. Landings of surf clams have been primarily recorded since 2003, with values fluctuating between £219,758 (2004) and £4,830 (2006). Landings of razor clams have been recorded since 2005, with peak landings values of £283,801 recorded in 2009.

Figure 18B.5 Annual Variations in Landings Values of Nephrops in the Study Area (Source: MMO)

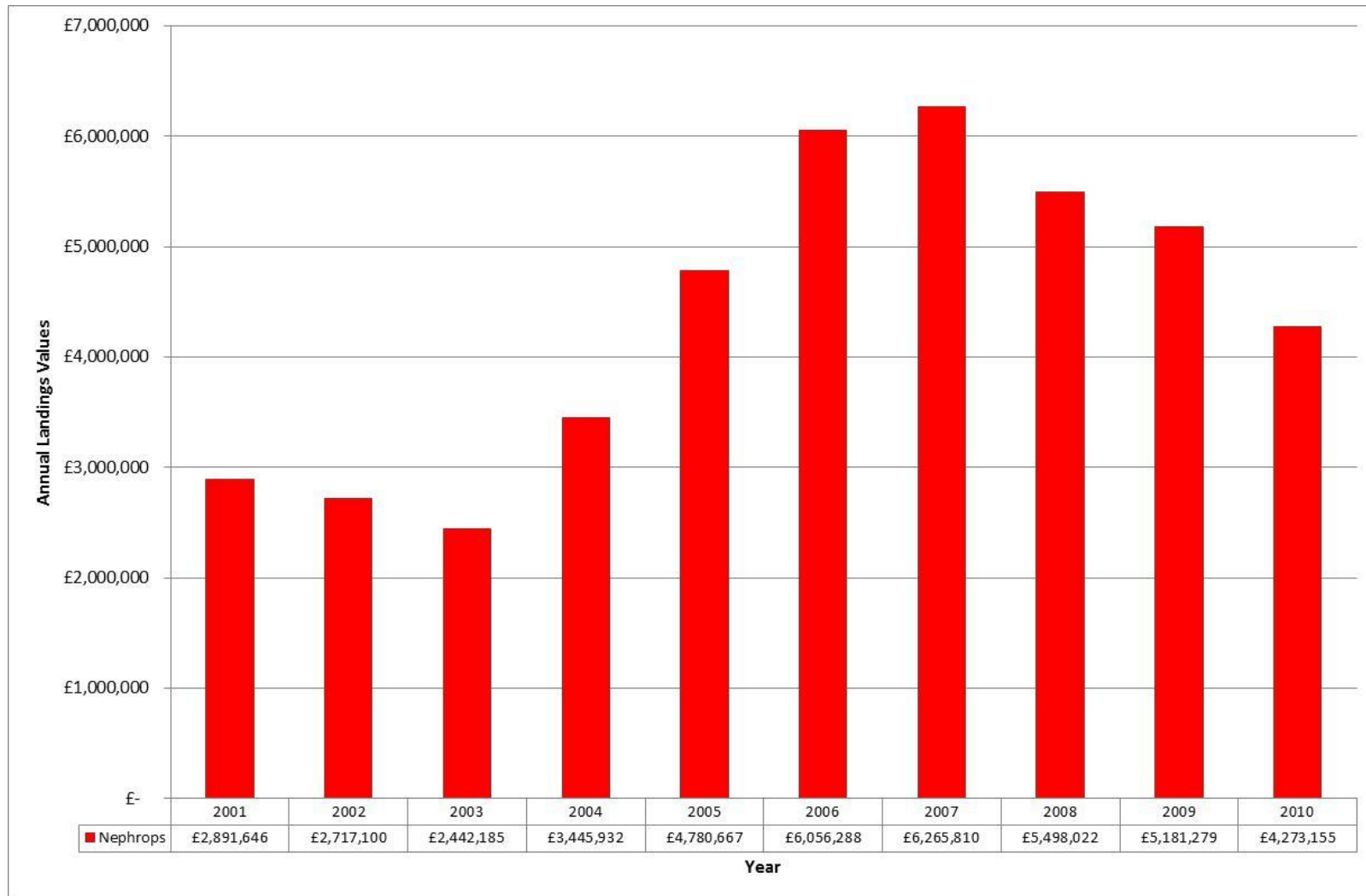


Figure 18B.6 Annual Variations in Landings Values of Crustaceans (Lobster, Edible Crab and Velvet Crab) in the Study Area (Source: MMO)

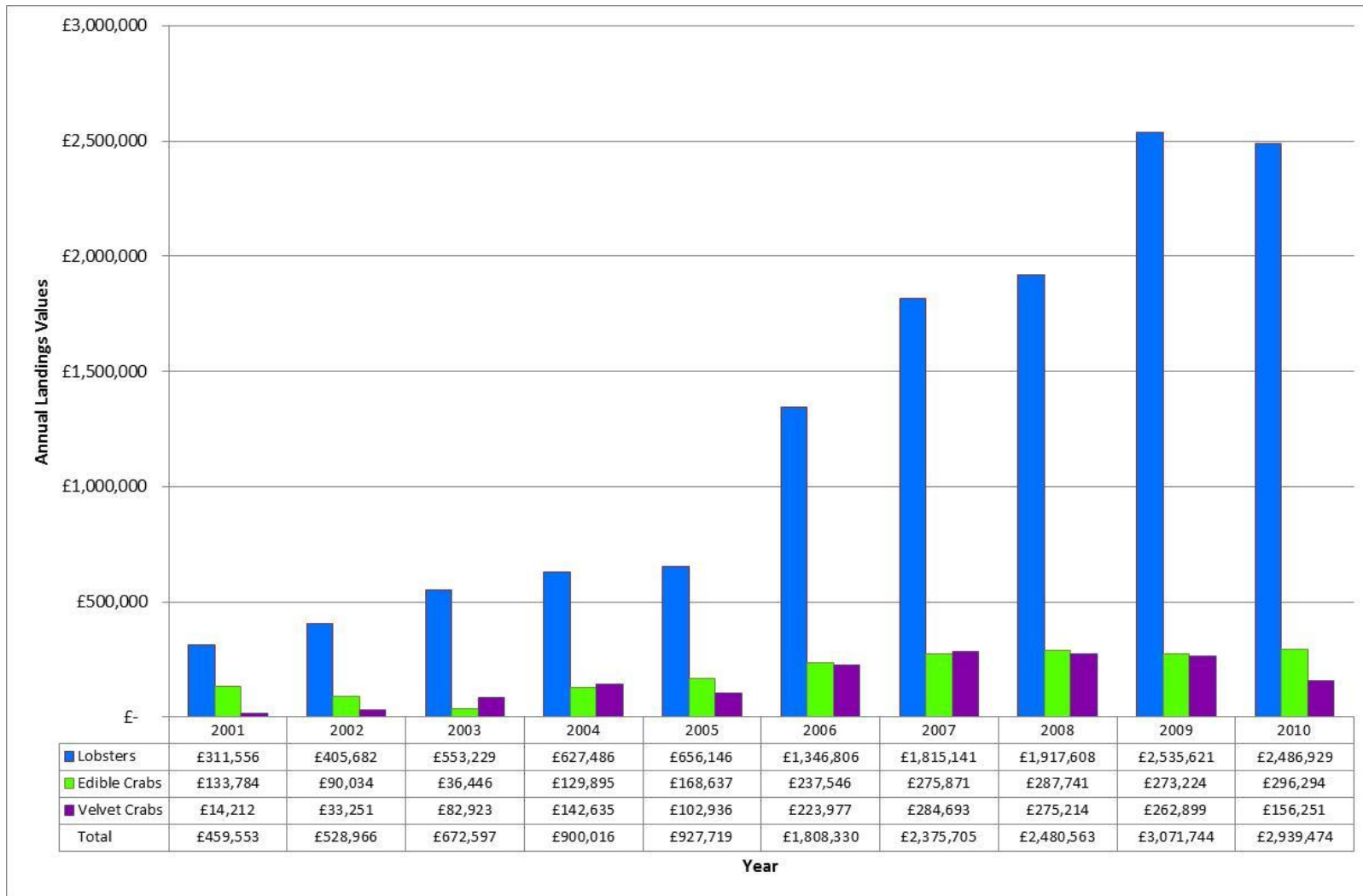


Figure 18B.7 Annual Variations in Landings Values of Scallops in the Study Area (Source: MMO)

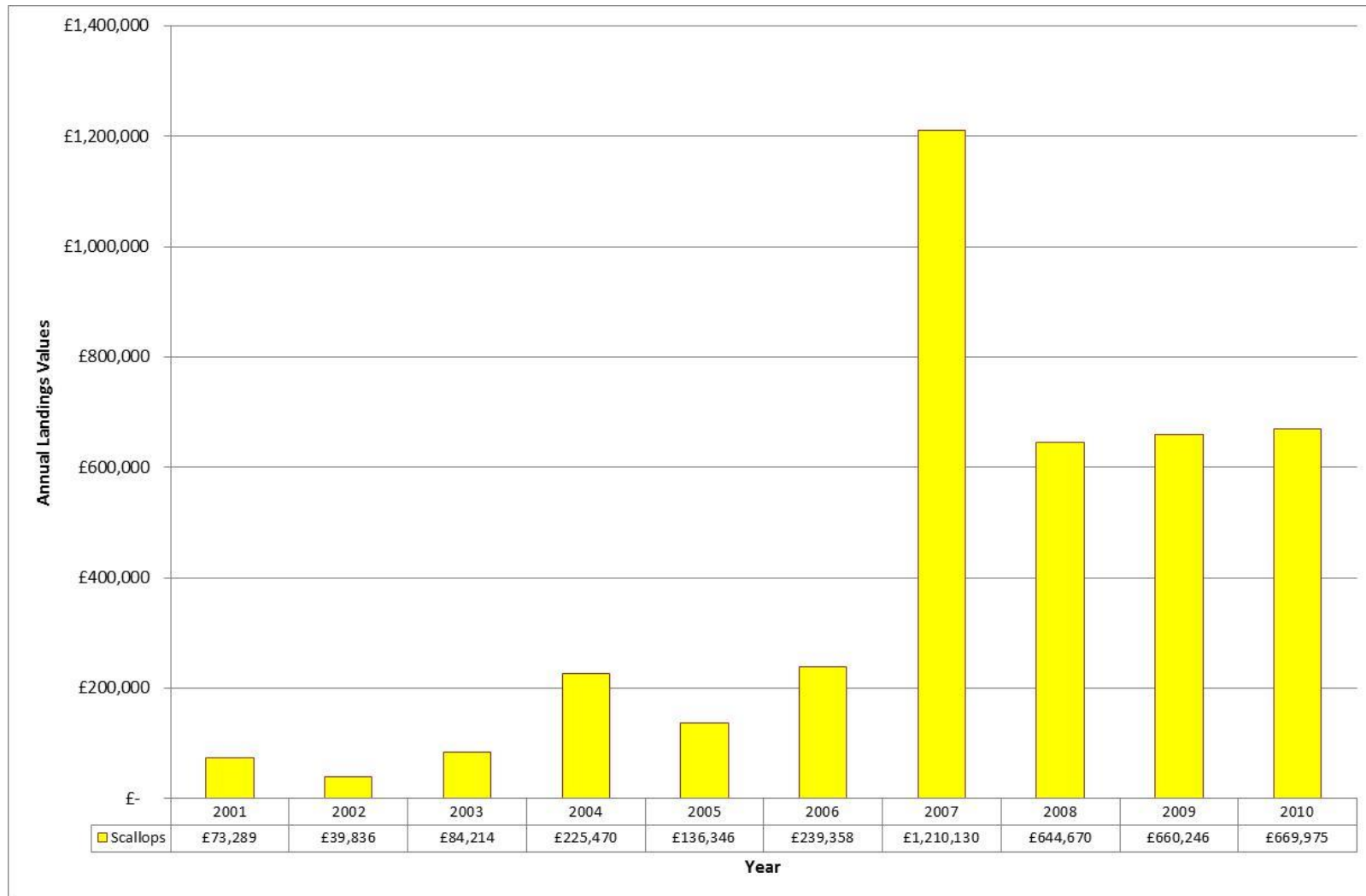


Figure 18B.8 Annual Variations in Landings Values of Squid in the Study Area (Source: MMO)

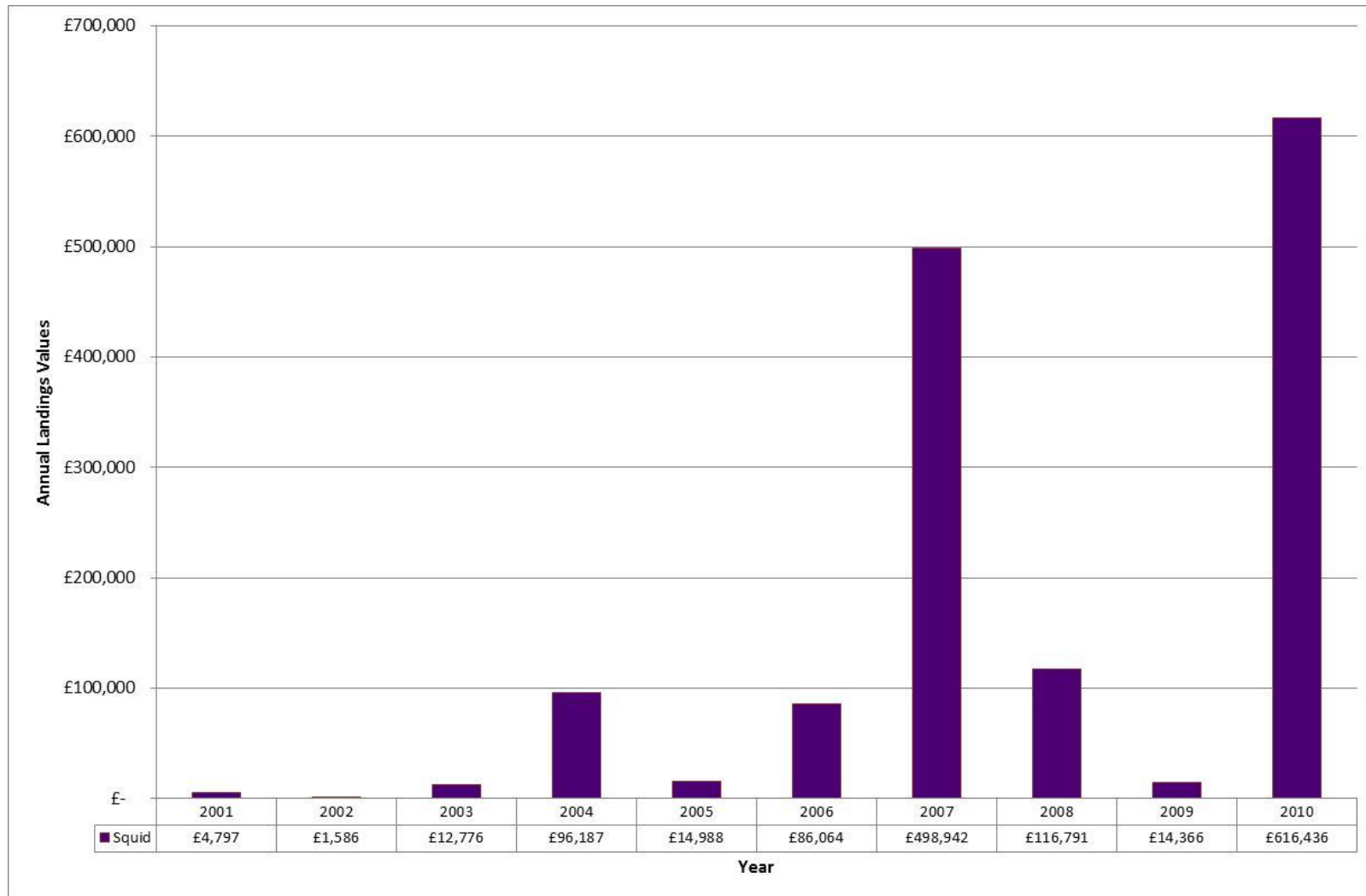
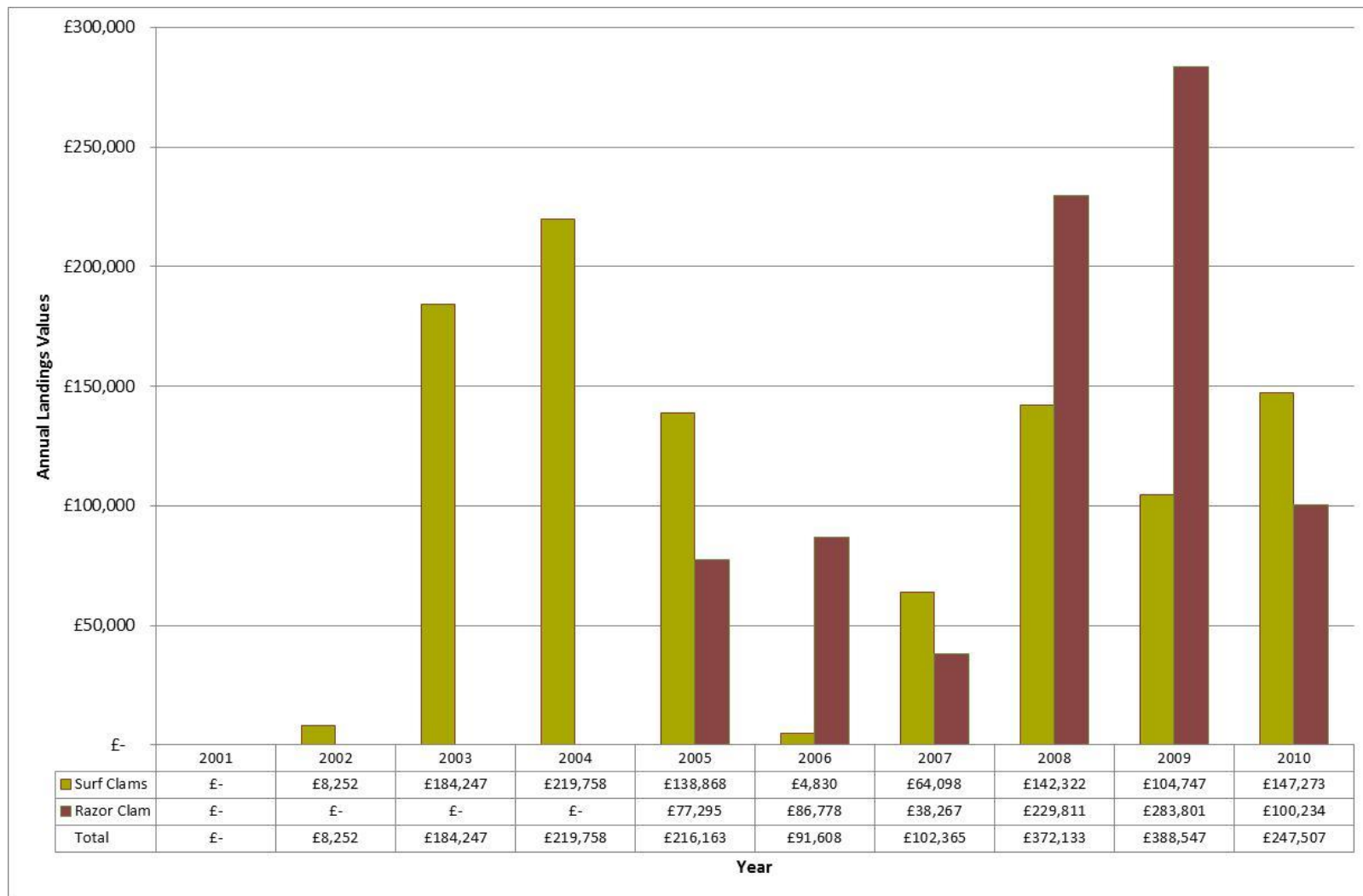


Figure 18B.9 Annual Variations in Landings Values of Clams (Razor and Surf Clams) in the Study Area (Source: MMO)



### 18B.3.2 Seasonality

Figure 18B.10 to Figure 18B.14 show the average seasonality of landings values of the top commercial species targeted in the study area.

Figure 18B.10 shows the average seasonality of nephrops. Landings values are highest in July and August (£766,996 in July) and low to moderate for the remainder of the year, with the lowest values recorded in May (£179,785).

Figure 18B.11 shows the average seasonality of lobsters, edible crabs and velvet crabs. Generally, the highest average landings values for all crustaceans are recorded in the second half of the year, particularly between July and September. Lobster landings show the most marked seasonality, with lowest values recorded in the initial months of the year before rising sharply in July (£176,710), and peaking in August (£298,854). Landings of edible and velvet crabs are generally consistent throughout the period, although slightly lower landings values are recorded at the beginning of the year.

Figure 18B.12 shows the average seasonality of scallops. The highest landings values are recorded between April and September, inclusive, peaking in June and August (£70,811 and £75,363, respectively). Landings values for the remainder of the year are relatively low, with the lowest recorded in January (£1,244).

Squid is seasonally present on an annual basis in the area, although as previously stated, abundance varies. Figure 18B.13 shows that the species is principally landed in August, September and October (£27,846, £66,163 and £41,757, respectively), although the season has been reported to be extending in recent years.

Figure 18B.14 shows the average seasonality of the top two commercial clam species targeted in the study area: surf and razor clams. Surf clam landings values fluctuate throughout the year, with the highest landings values recorded in August (£12,181). Razor clam landings values also vary throughout the year, with the highest landings values recorded in February (£10,410). The lowest landings for both species are recorded in January (£1,868 and £4,669, respectively).

Figure 18B.10 Average Annual (2001-2010) Seasonality of Nephrops (Source: MMO)

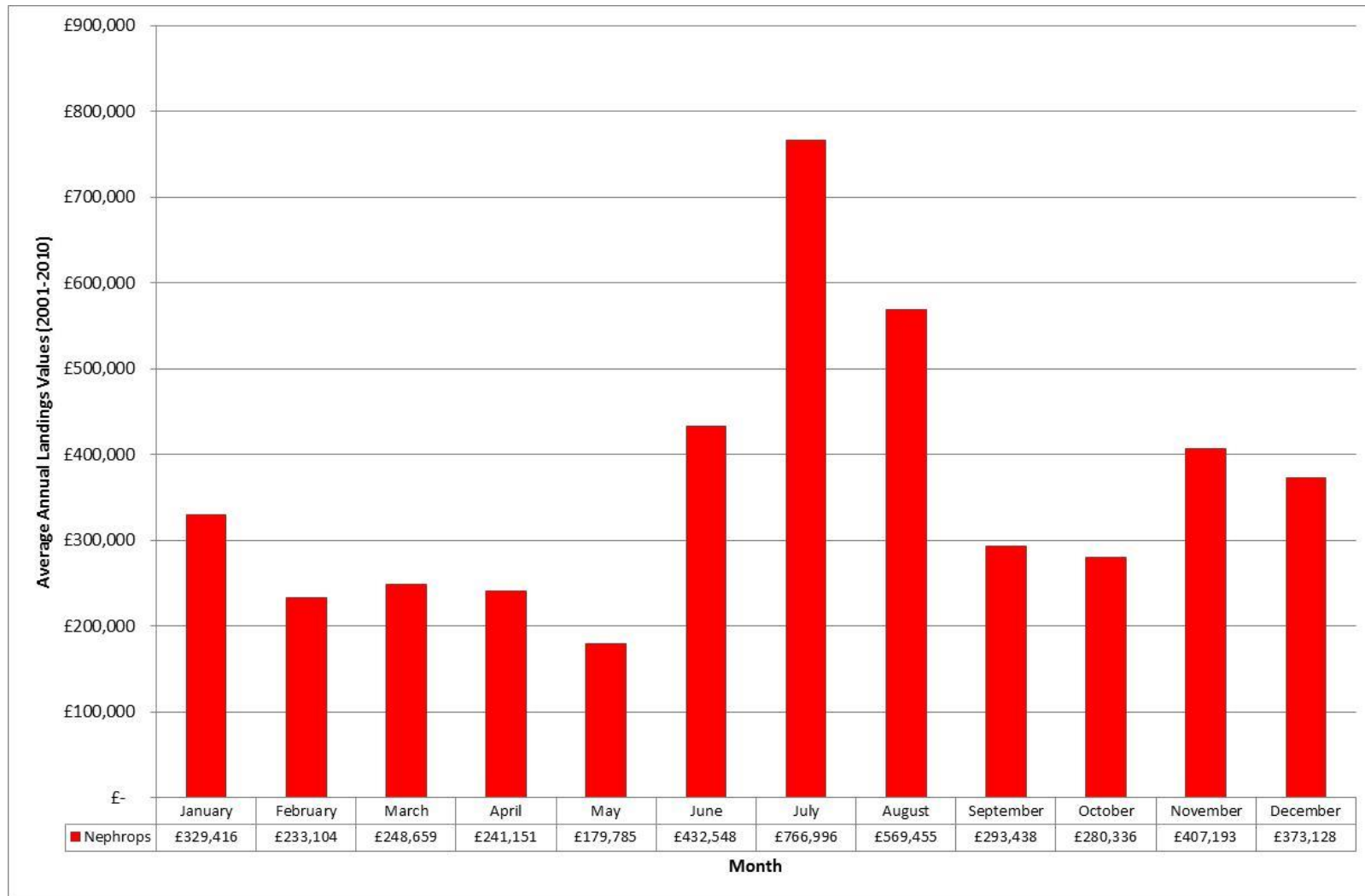


Figure 18B.11 Average Annual (2001-2010) Seasonality of Crustaceans (Lobsters, Edible Crabs and Velvet Crabs) (Source: MMO)

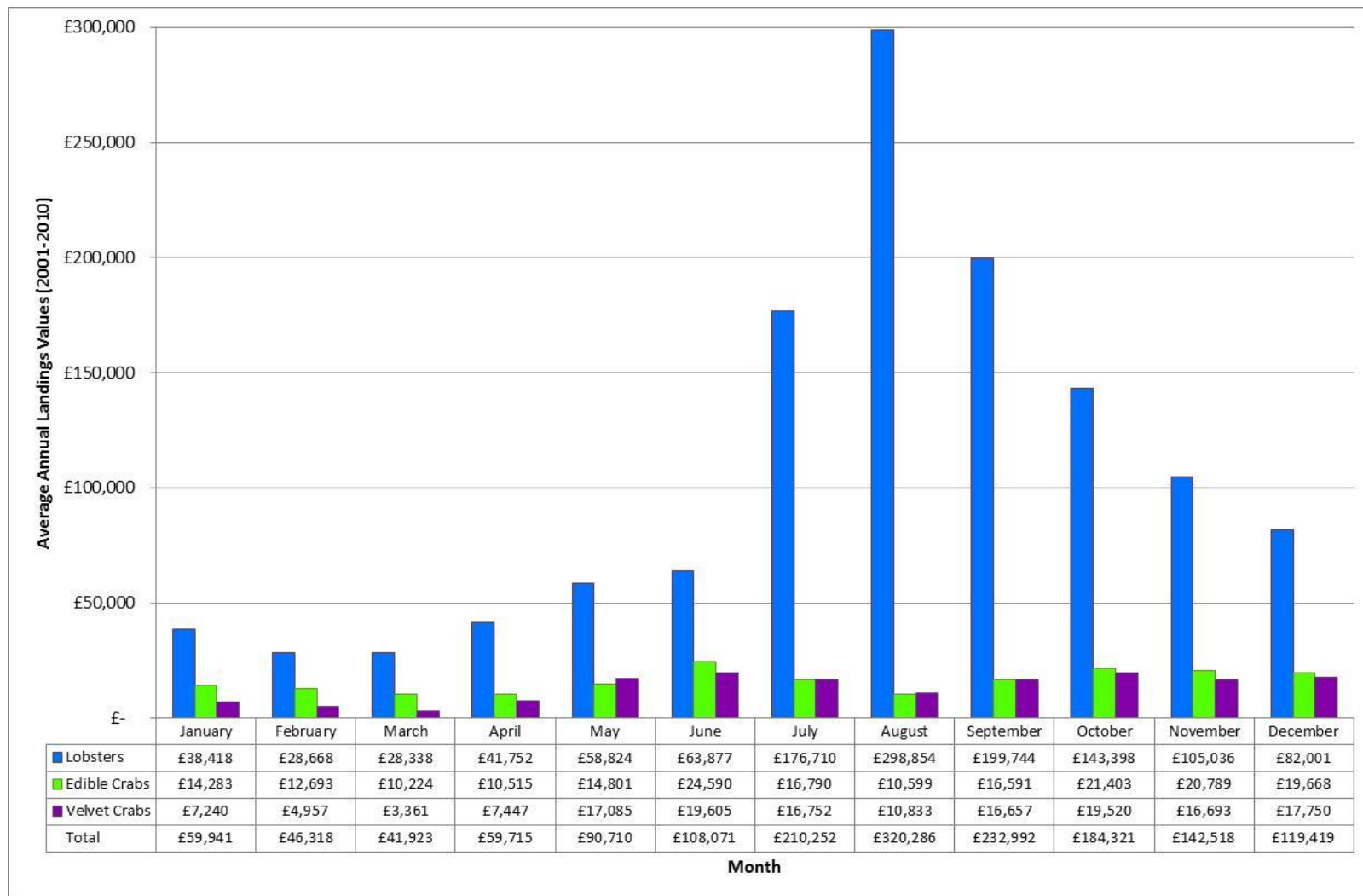


Figure 18B.12 Average Annual (2001-2010) Seasonality of Scallops (Source: MMO)

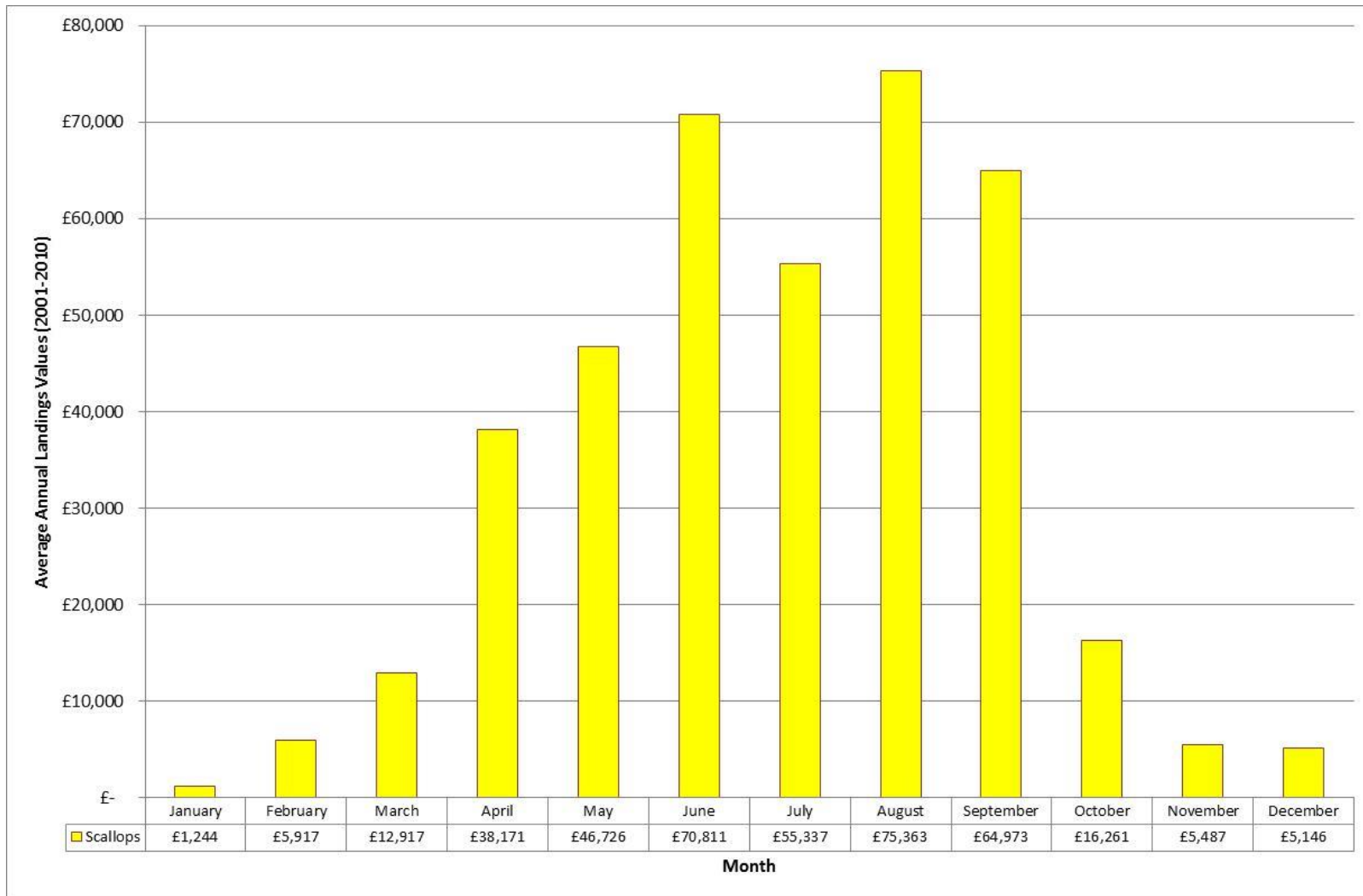


Figure 18B.13 Average Annual (2001-2010) Seasonality of Squid (Source: MMO)

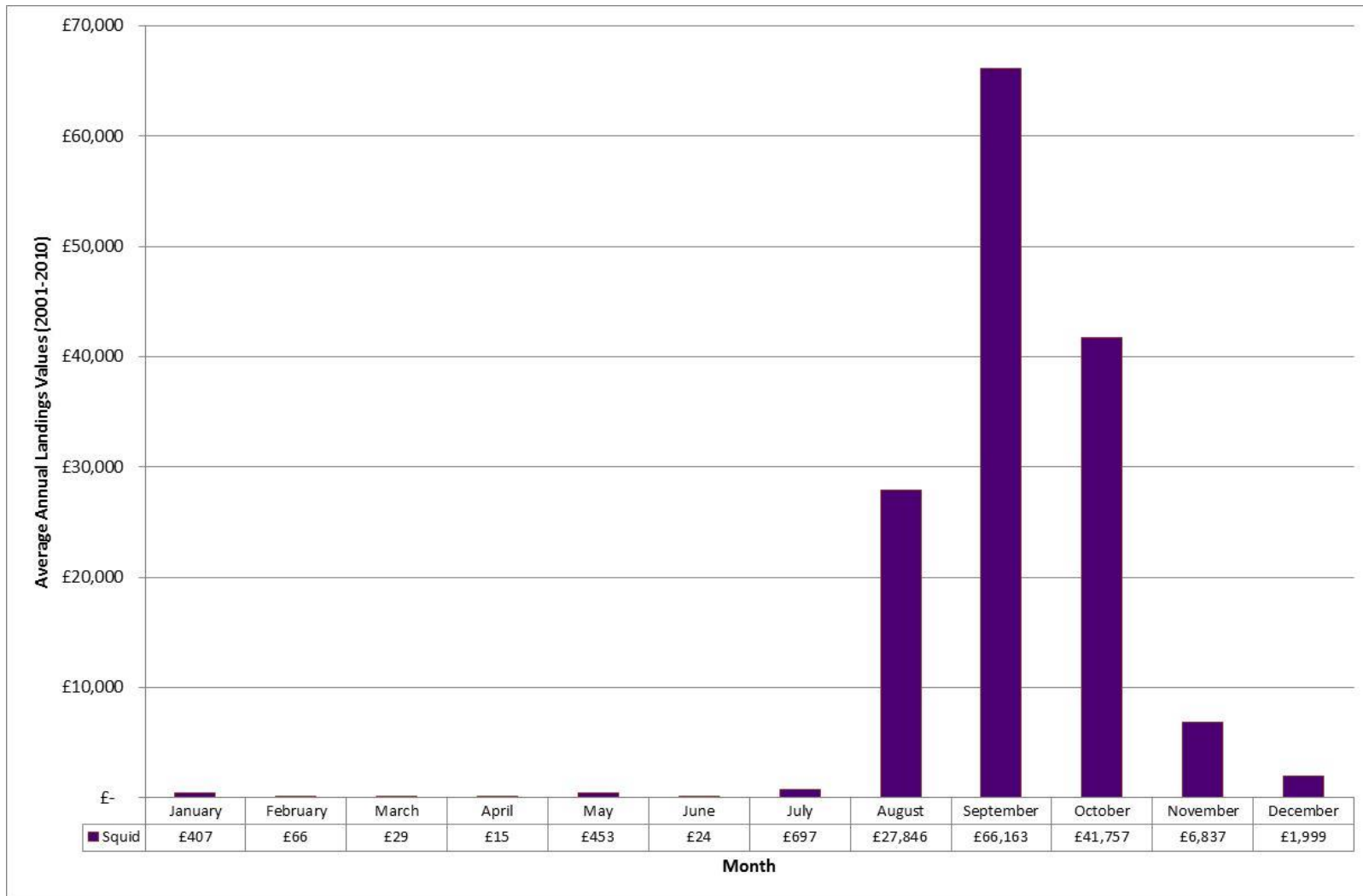
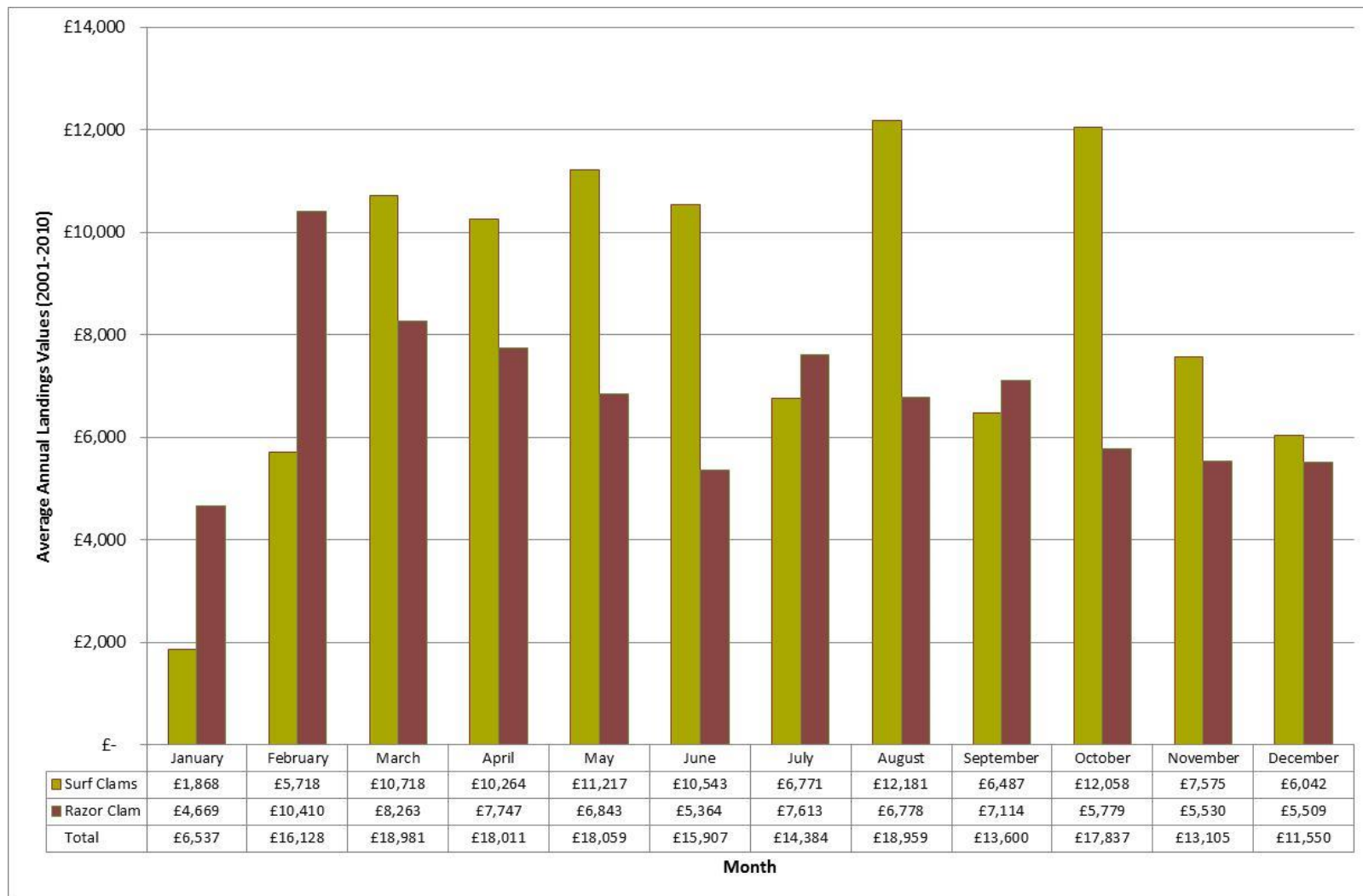


Figure 18B.14 Average Annual (2001-2010) Seasonality of Clams (Surf and Razor Clams) (Source: MMO)



### 18B.3.3 Landings Values by Port

Table 18B.1 to Table 18B.3 list the top 10 ports by landings values in 40E7, 41E6 and 41E7, respectively, and the percentage of each ports' total income that this represents.

Table 18B.1 shows that the highest percentage of landings from 40E7 are into the port at Eyemouth (73.0%) which represents 28.3% of the ports' total annual income. St. Abbs records the second highest percentage of landings from 40E7 (12.3%), however this represents 93.4% of the ports total annual income. Table 18B.2 shows that the highest percentage of landings from 41E6 are recorded by vessels landing into Port Seton (88.1%) and this represent 93.3% of the ports' total annual income.

Table 18B.3 shows that the highest percentage of landings from 41E7 are into the ports of Pittenweem (50.9%) and Dunbar (12.3%) and this represents 95.4% and 85.7% of the ports' total annual income, respectively. The ports of Crail (5.8%), Methil and Leven (5.0%), St. Andrews (2.8%) and Anstruther (2.6%) record lower percentages of the total landings values from 41E7 but landings from this rectangle contribute 99.6%, 95.8%, 99.1% and 99.5% of their total average annual values, respectively.

**Table 18B.1 Top 10 Ports by Landings Values from ICES Rectangle 40E7 (Source: MMO)**

Port	Average annual landings values (£) in the local study area	% of average annual values in the local study area	Total average annual port value	% of total average annual port value that the local study area represents
Eymouth	£996,699	73.0%	£3,525,875	28.3%
St Abbs	£168,247	12.3%	£180,164	93.4%
Dunbar	£88,775	6.5%	£666,335	13.3%
Burnmouth	£60,735	4.4%	£231,873	26.2%
Cove (Leith)	£15,842	1.2%	£63,917	24.8%
Port Seton	£12,176	0.9%	£756,326	1.6%
Pittenweem	£8,527	0.6%	£2,471,441	0.3%
Blyth	£5,248	0.4%	£2,423,068	0.2%
North Shields	£2,149	0.2%	£3,619,128	0.1%
Aberdeen	£1,850	0.1%	£10,608,148	0.0%

Table 18B.2 Top 10 Ports by Landings Values from ICES Rectangle 41E6 (Source: MMO)

Port	Average annual landings values (£) in the local study area	% of average annual values in the local study area	Total average annual port value	% of total average annual port value that the local study area represents
Port Seton	£705,790	88.1%	£756,326	93.3%
Eyemouth	£16,752	2.1%	£3,525,875	0.5%
Cove (Leith)	£11,713	1.5%	£63,917	18.3%
Newhaven	£11,192	1.4%	£31,438	35.6%
Pittenweem	£10,956	1.4%	£2,471,441	0.4%
Aberdeen	£8,830	1.1%	£10,608,148	0.1%
Granton	£7,029	0.9%	£55,275	12.7%
Methil and Leven	£6,046	0.8%	£242,488	2.5%
Dunbar	£4,551	0.6%	£666,335	0.7%
Ijmuiden	£3,435	0.4%	£19,552,069	0.0%

Table 18B.3 Top 10 Ports by Landings Values from ICES Rectangle 41E7 (Source: MMO)

Port	Average annual landings values (£) in the local study area	% of average annual values in the local study area	Total average annual port value	% of total average annual port value that the local study area represents
Pittenweem	£2,358,241	50.9%	£2,471,441	95.4%
Dunbar	£571,090	12.3%	£666,335	85.7%
Eyemouth	£320,798	6.9%	£3,525,875	9.1%
Crail	£268,241	5.8%	£269,437	99.6%
Methil and Leven	£232,361	5.0%	£242,488	95.8%
Aberdeen	£181,441	3.9%	£10,608,148	1.7%
St Andrews	£129,795	2.8%	£131,028	99.1%
Anstruther	£122,288	2.6%	£122,888	99.5%
Arbroath	£81,654	1.8%	£888,830	9.2%
Montrose	£45,054	1.0%	£283,802	15.9%

## 18B.4 Satellite Tracking

Since January 2005, all European Commission (EC) vessels of over-15 metres in length have been fitted with satellite tracking equipment which transmits the vessels' position every two hours to the relevant Member States' fisheries authorities. The datasets have been provided to Brown and May Marine (BMM) by the MMO and Marine Scotland. An explanation of the VMS datasets, including limitations, is provided in ES Appendix 18A (Commercial Fisheries Baseline Development Area)). As has been previously stated, however, it should be recognised that activity by vessels under-15 metres will not be included in this dataset.

Due to the differences in data provided for satellite tracked vessels in 2009, analysis of activity for this year is discussed separately in *Section 18B.4.2* below.

### 18B.4.1 2007 to 2010 Data

Figure 18B.15 and Figure 18B.16 show the relative density of all UK vessels over-15 metres (average 2007 to 2010) by value and effort, respectively. A pattern of activity is recorded in areas running parallel to the coast to the south and north of the Forth and Tay area, which the offshore export cable corridor transects.

### 18B.4.2 2009 Data

Figure 18B.17 shows the satellite density of all UK over-15 metre vessels in 2009. Patterns are broadly commensurate to those in the 2007 to 2010 dataset, although the larger grid format of this dataset presents the activity as seeming to be of a higher intensity.

Figure 18B.18 and Figure 18B.19 provide a breakdown of density by gear type, which was not possible to apply to the dataset between 2007 and 2010, showing nephrops gear and dredges, respectively.

Activity (Figure 18B.18) by vessels targeting nephrops is concentrated in the south of the study area, through which the offshore export cable corridor passes. It should be noted that a number of locally based nephrops vessels are under-15 metres in length and hence not represented by this dataset.

Scallop dredging activity is recorded in an area through which the northern portion of the offshore export cable corridor passes. Density levels reduce to low along the inshore sections of the offshore export cable corridor (Figure 18B.19).

Figure 18B.15 VMS Density by Value (Average 2007-2010) in the Regional Study Area (Source: MMO)

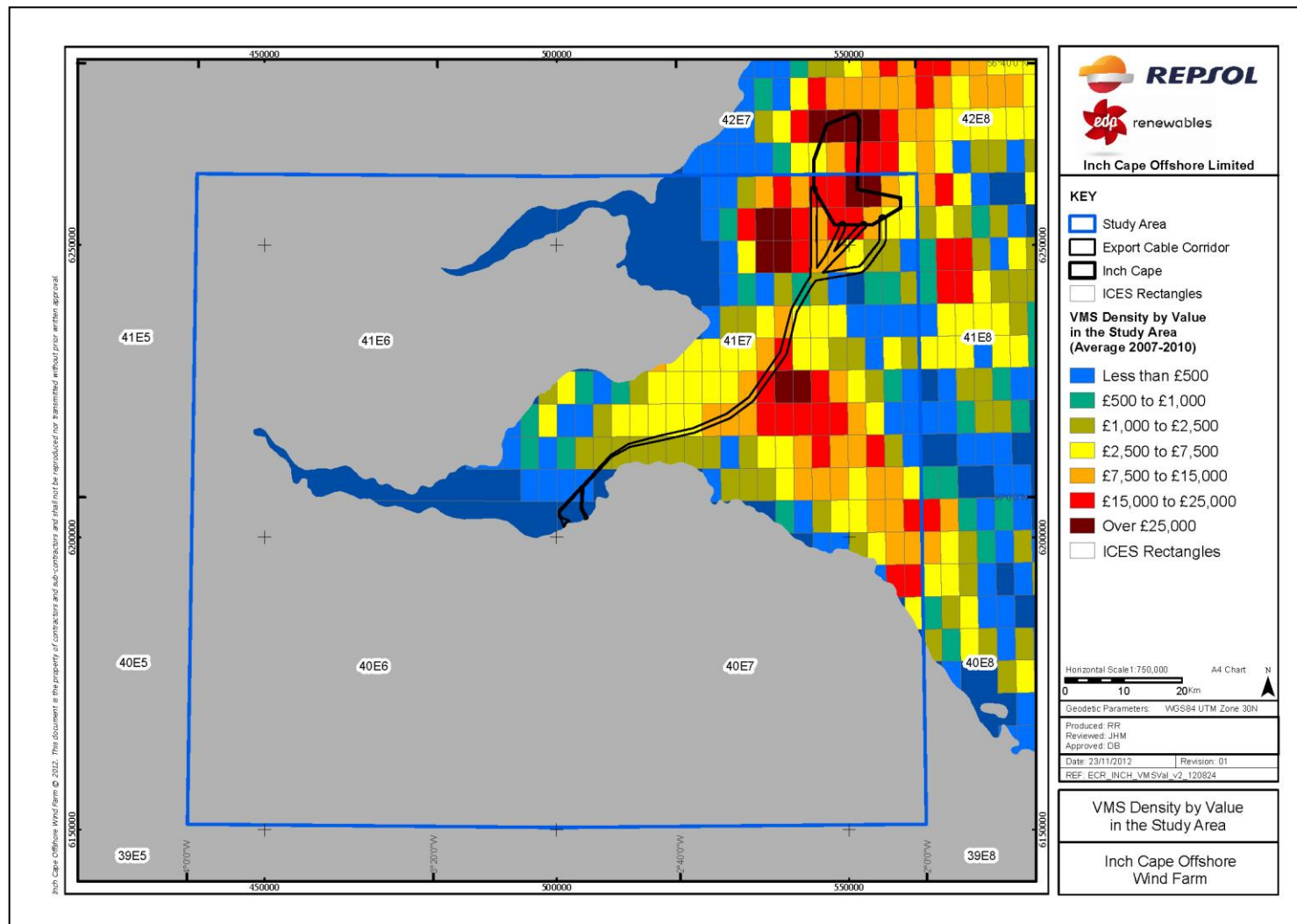


Figure 18B.16 VMS Density by Effort (Days; Average 2007-2010) in the Regional Study Area (Source: MMO)

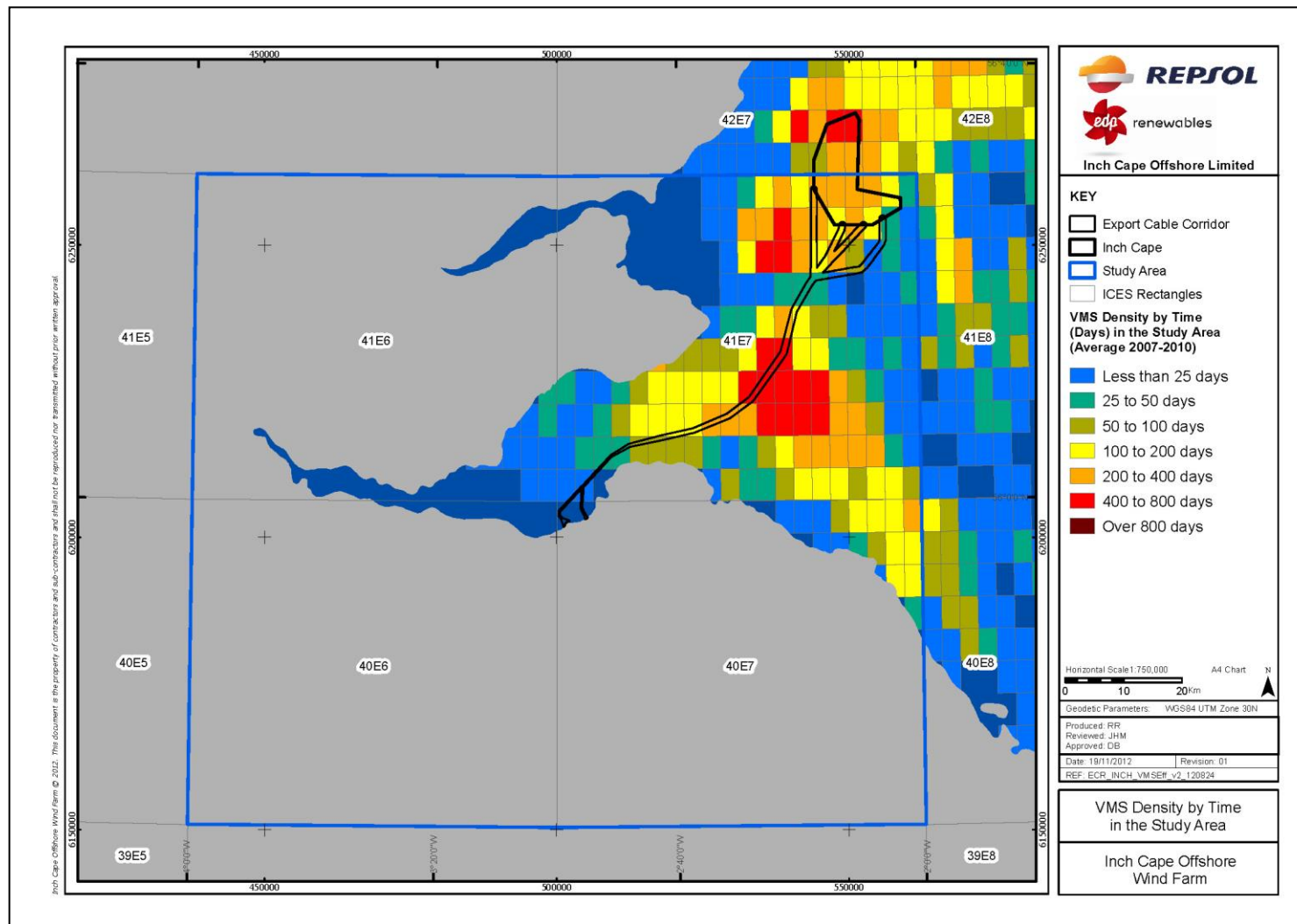


Figure 18B.17 Satellite (VMS) Density of All UK Over-15 Metre Vessels in 2009

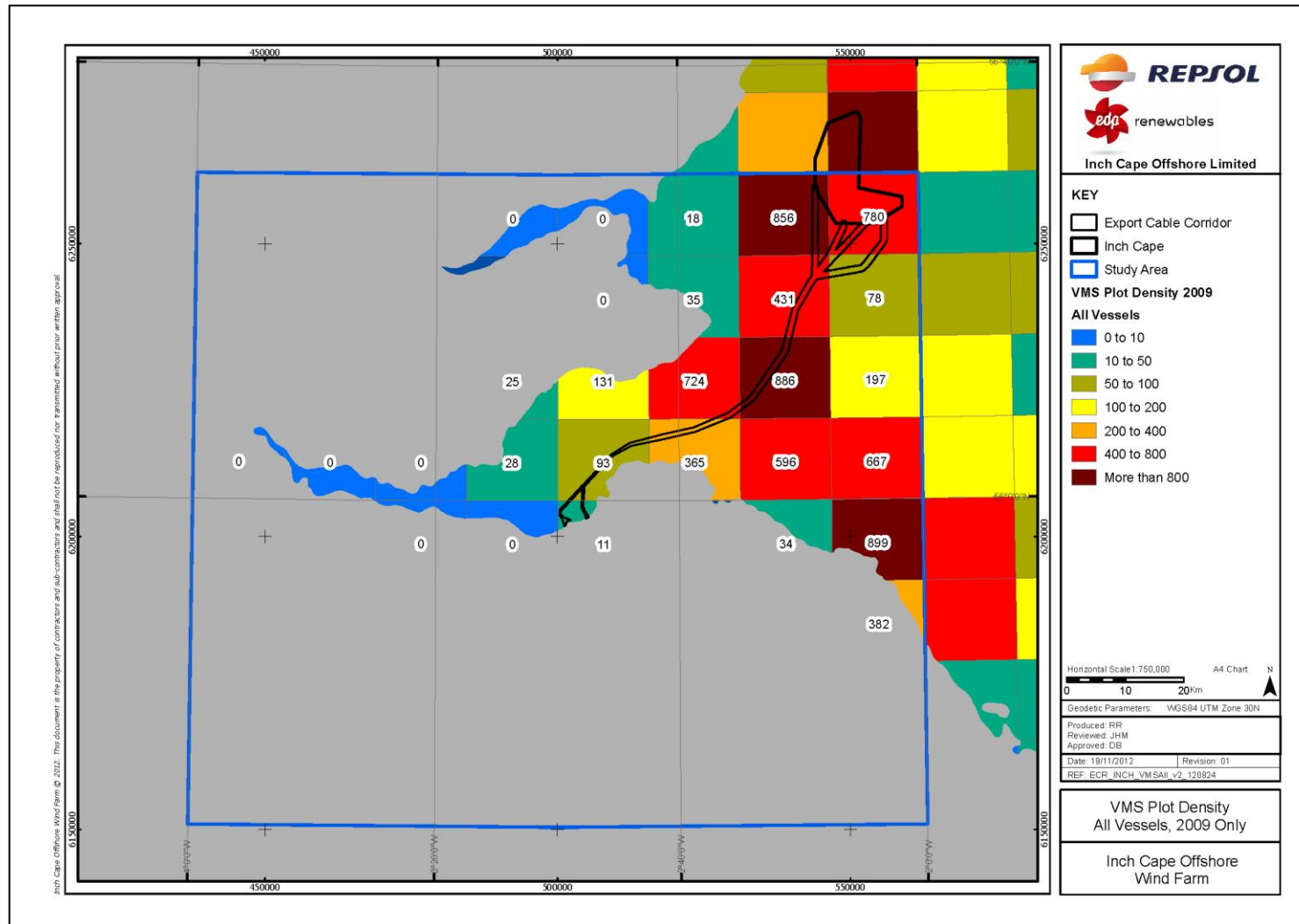


Figure 18B.18 Satellite (VMS) Density of UK Over-15 Metre Vessels in 2009, Nephrops Gear Only

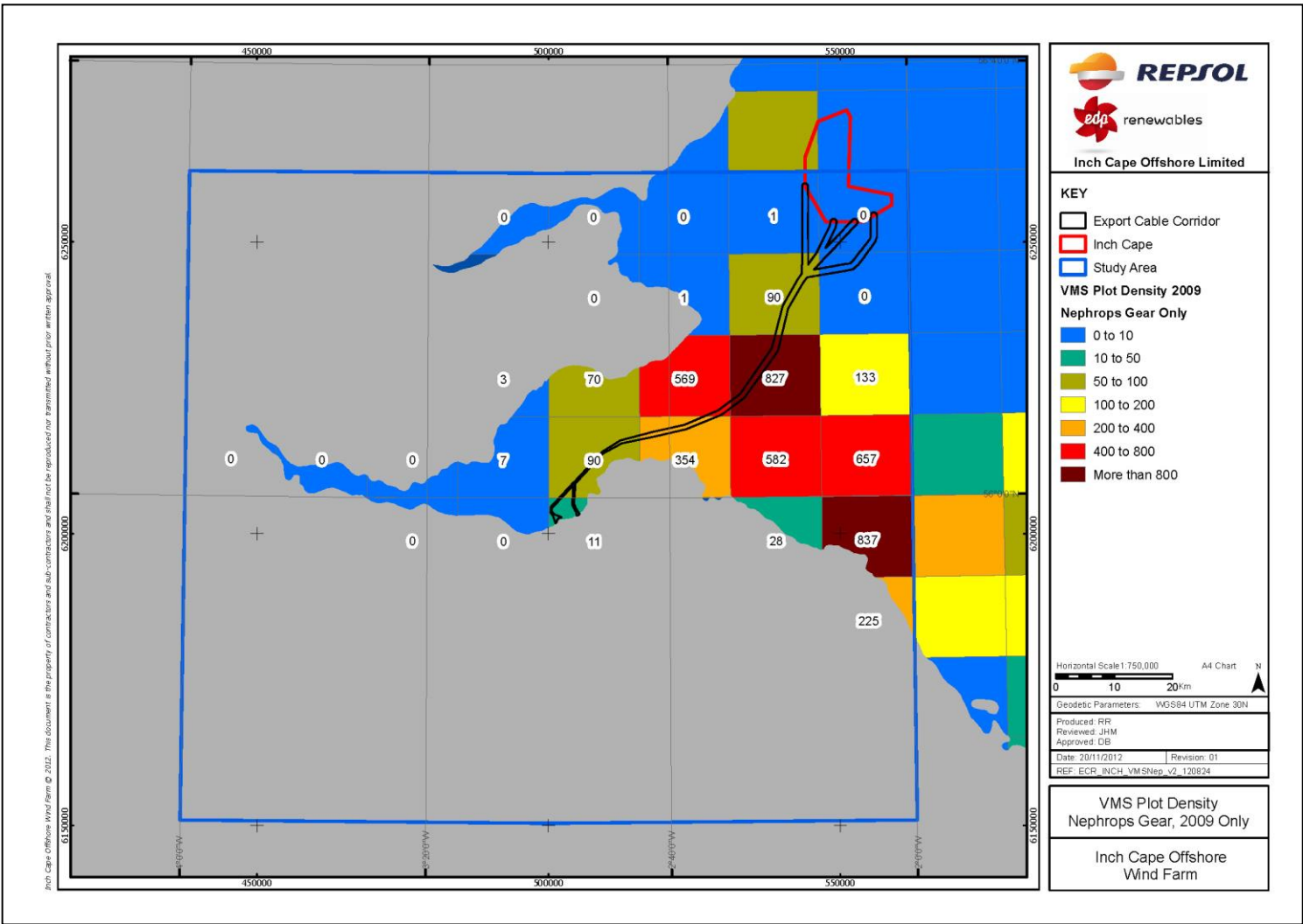
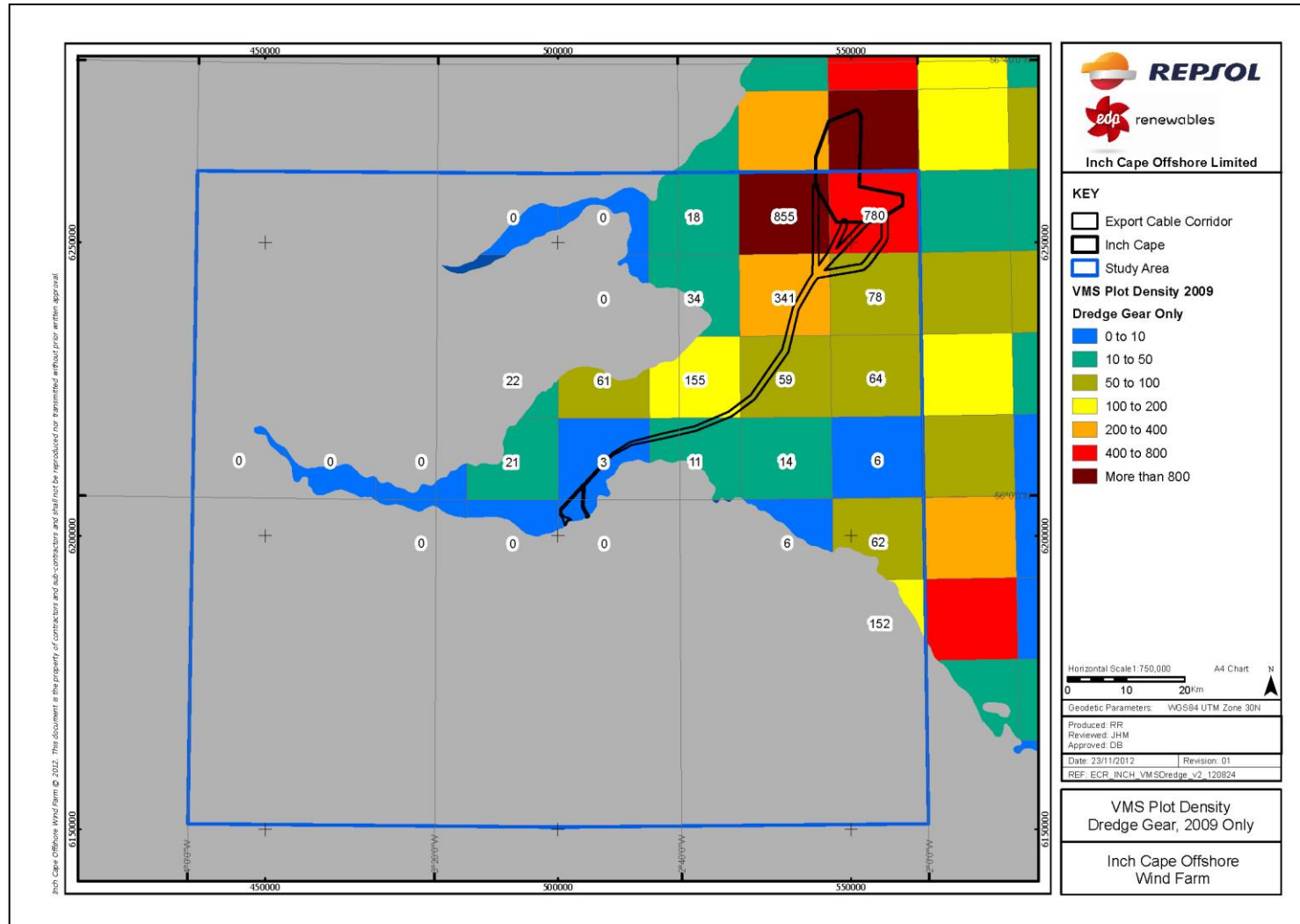


Figure 18B.19 Satellite (VMS) Density of UK Over-15 Metre Vessels in 2009, Scallop Dredge Gear Only



### **18B.5 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. As stated in ES Appendix 18A, limitations of this dataset apply, and the activity of vessels under-15 metres is not included.

Figure 18B.20 to Figure 18B.23 show the distribution of commercial fishing activities in the Forth and Tay area for over-15 metre UK vessels in 2010 only by nephrops, scallop, squid and demersal fisheries, respectively.

The offshore export cable corridor transects grounds which are predominantly fished by vessels targeting nephrops, with grounds extending from the mid-section of the corridor to the south. Scallop activity is predominantly recorded along the northern section of the offshore export cable corridor, in areas adjacent to the Inch Cape Wind Farm site, with activity becoming sparse to the south. Comparatively low levels of squid and demersal activity have been recorded along the offshore export cable corridor.

Figure 18B.20 Distribution of Nephrops by Value (Average 2007 to 2011) in the Export Cable Study Area (Source: Marine Scotland, 2012)

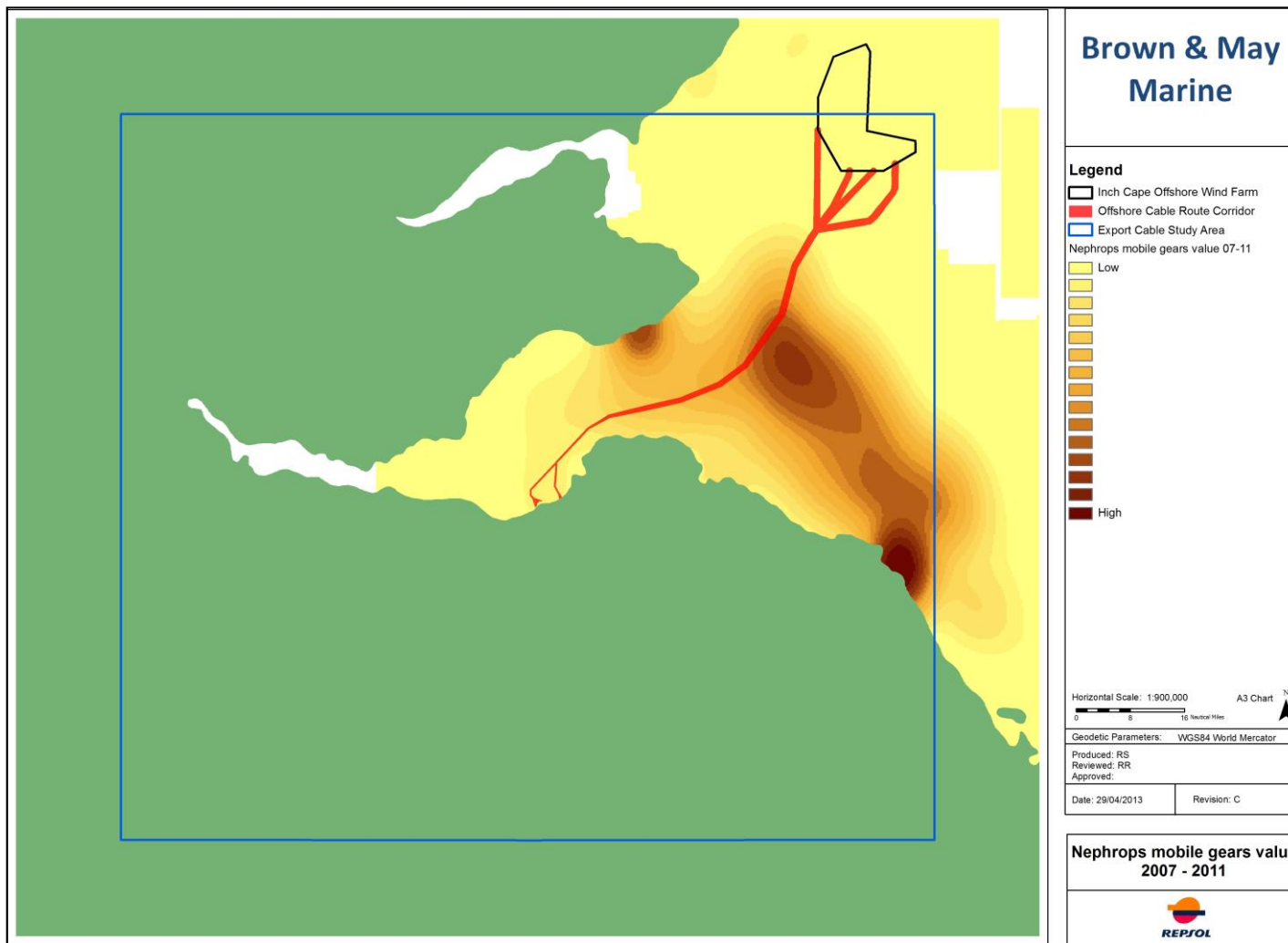


Figure 18B.21 Distribution of Scallops by Value (Average 2007 to 2011) in the Export Cable Study Area (Source: Marine Scotland, 2012)

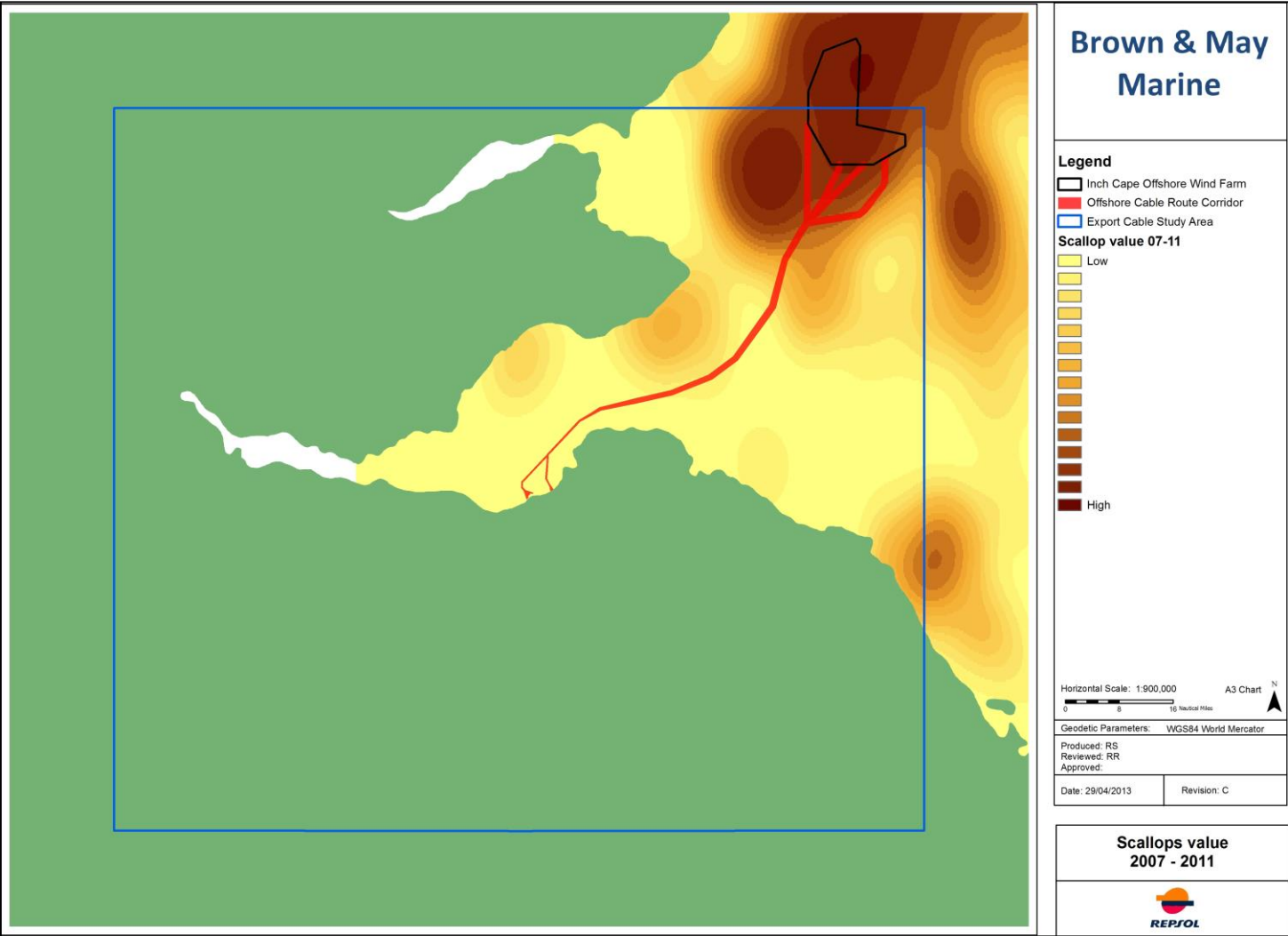


Figure 18B.22 Distribution of Squid by Value (Average 2007 to 2011) in the Export Cable Study Area (Source: Marine Scotland, 2012)

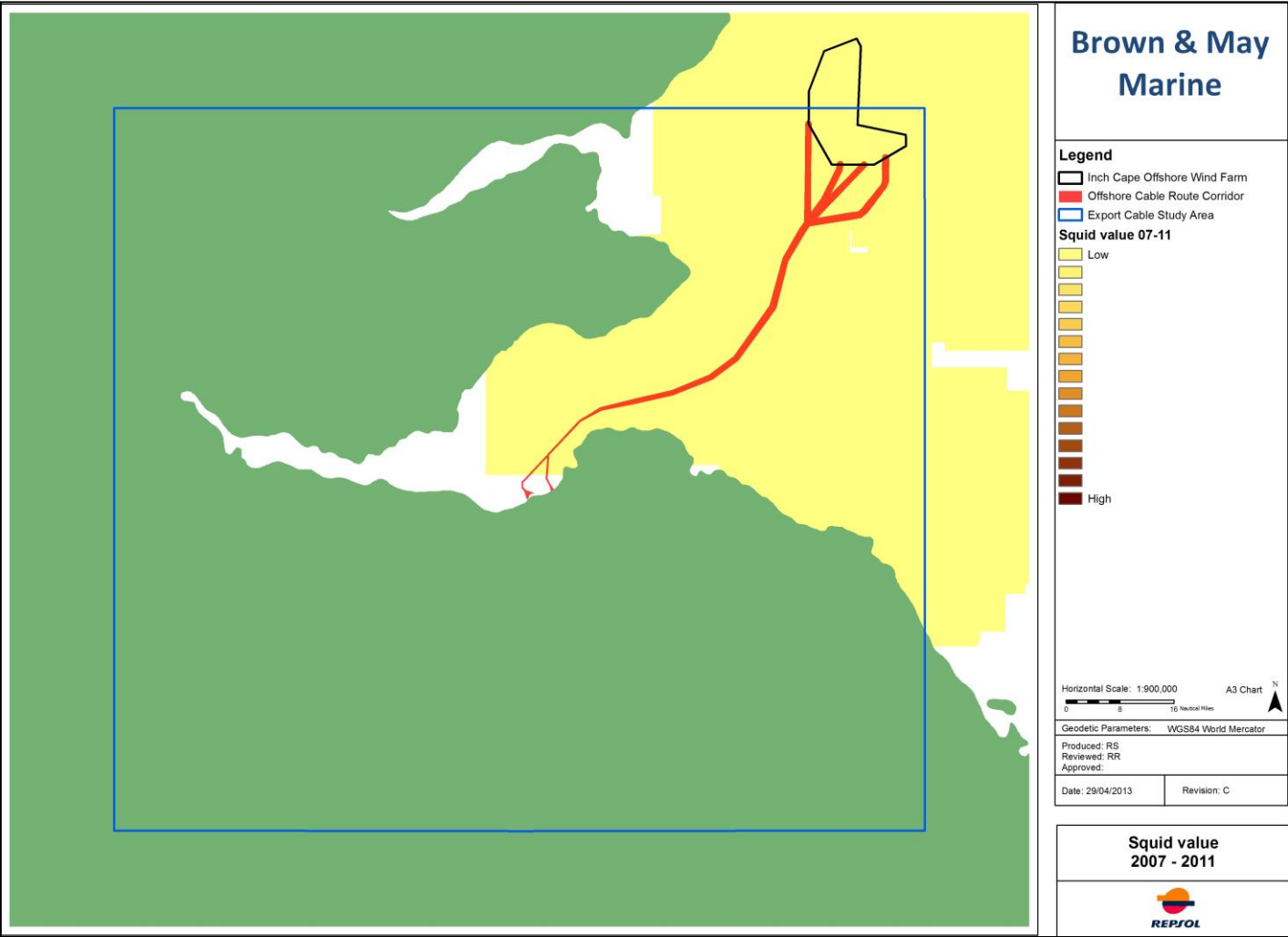
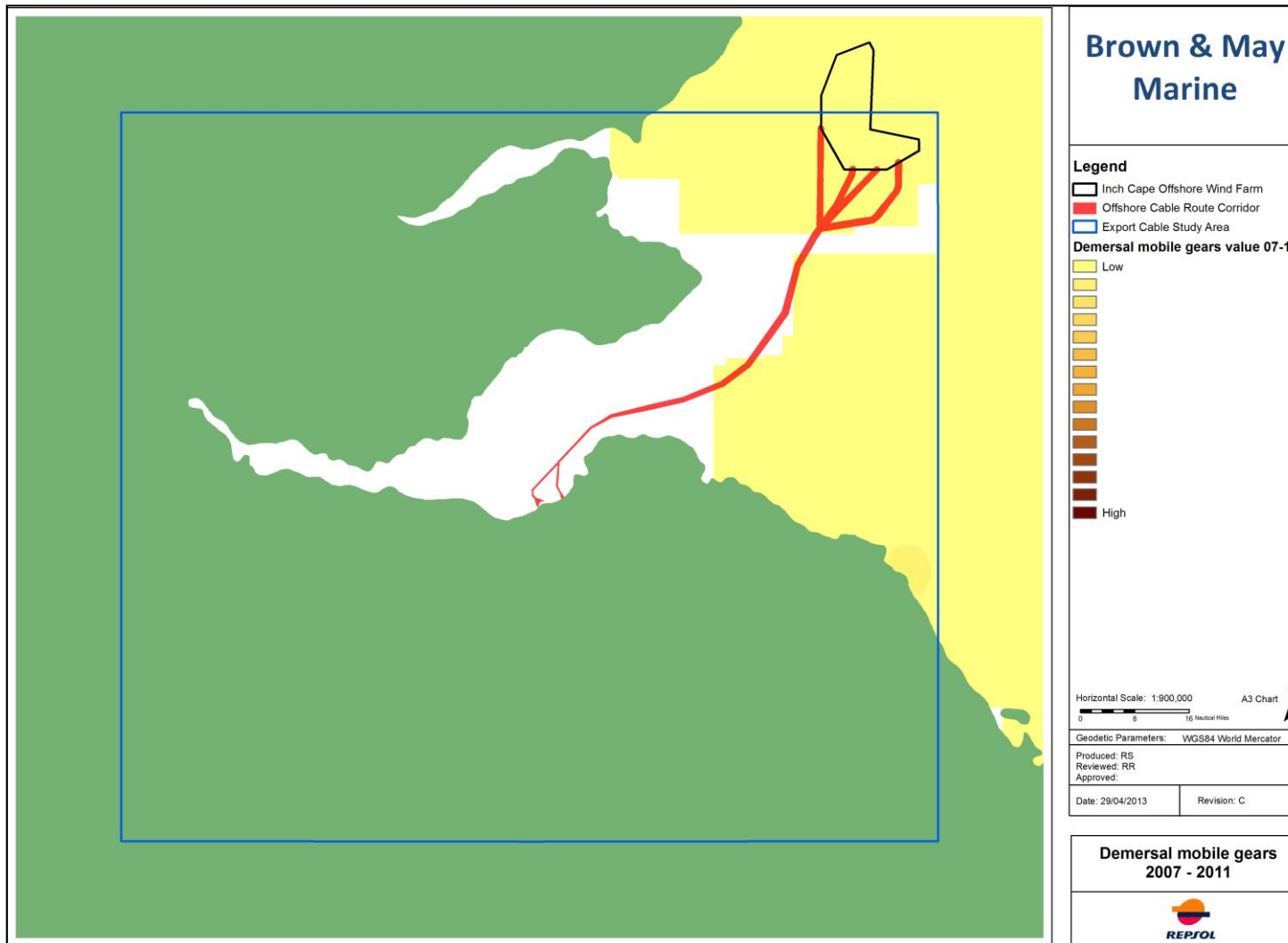


Figure 18B.23 Distribution of Demersal Landings by Value (Average 2007 to 2011) in the Export Cable Study Area (Source: Marine Scotland, 2012)



## 18B.6 Fishing Vessels, Patterns and Practices

The offshore export cable corridor passes through grounds targeted by vessels described below; it should be noted however that the offshore export cable corridor constitutes only a small percentage of the total area fished by these vessels.

### 18B.6.1 Nephrops

The majority of vessels targeting nephrops in the Forth and Tay area have home ports in the area. Local vessels reported to target nephrops, whose operational ranges will allow them to fish the grounds in the vicinity of the offshore export cable corridor, are listed in Table 18B.4.

With regard to the patterns and practices of activity, the seasonality analysis (*Section 18B.3.2*) demonstrates that fishing activity for nephrops fluctuates seasonally, with the most intense fishing occurring in the summer months. This was confirmed in consultation with local fishing interests. Further, it was reported that nephrops vessels work predominantly at night during this period. Fishing is ongoing for the remainder of the year, although at lower levels. Due to the smaller size of the local fleet, vessels are constrained by weather conditions, particularly in the winter months.

As the Commercial Fisheries Baseline Development Area technical report (Appendix 18A) has identified, Pittenweem is the principal nephrops port in the local area, in the vicinity of the offshore export cable corridor. There are several vessels based at Pittenweem which will target nephrops throughout the Forth, however the majority of activity is concentrated around the Bell Rock area. These vessels will seasonally target the squid fishery and grounds are more widespread than those fished in the nephrops fishery. A number of Pittenweem registered vessels will fish grounds through which the offshore export cable corridor passes (pers. comm. Pittenweem fishermen, 2010).

In addition, two of the ports in the immediate area of the landfall and inshore section of the offshore export cable corridor are Dunbar and Port Seton and Cockenzie. Seven vessels based at Dunbar currently trawl for nephrops in the vicinity of the cable route. These vessels will seasonally target the squid fishery. One vessel is also reported to target scallops (pers. comm. Dunbar fishermen, 2012). Consultation with fishermen from Port Seton and Cockenzie identified a number of locally based nephrops vessels: 12 trawlers are currently reported to operate out of Port Seton, all of which are under-15 m in length (pers. comm. Port Seton and Cockenzie Fishermen's Association, October 2012). It was reported that these vessels spend 100% of their time targeting grounds in the Forth, and that the grounds are sustainably fished by the fleet. Vessels predominantly work in grounds to the north of the near-shore section of the cable route in the inner section of the Forth (consultation, January 2012). As with the Dunbar vessels, the majority of these vessels are able to seasonally target the squid fishery.

Table 18B.4 below lists the nephrops vessels reported to target grounds in the Firth of Forth area. The basic specifications of an example vessel targeting nephrops in the immediate area of the offshore export cable corridor are provided in Table 18B.5.

In addition to local vessels, there are a number of visiting vessels who will seasonally target nephrops grounds in the Forth and Tay area, landing their catch into ports at Eyemouth, Anstruther and Arbroath. Vessels from the north east English nephrops fleet are generally present during the summer months, with some vessels from the west coast targeting nephrops in the area during the autumn and winter (pers. comm. Eyemouth Fishery Office, October 2010). The number of visiting vessels varies year on year and depends upon the productivity of grounds in the area and elsewhere (pers. comm. FIR, 2011). Table 18B.6 lists visiting vessels reported to target nephrops in the vicinity

of the offshore export cable corridor (NB: The vessels highlighted (\*) in Table 18B.4 and have been identified as able to reconfigure gear to target squid on a seasonal basis).

**Table 18B.4 Vessels Reported to Target Nephrops in the Vicinity of the Offshore Export Cable Corridor**

Vessel	Length (m)	Home port
Vessel AC	8.00	Dunbar
Vessel DQ	8.00	Port Seton
Vessel AD	8.65	Eyemouth
Vessel DT	9.11	Port Seton
Vessel AG*	9.49	Port Seton
Vessel AH*	9.70	Pittenweem
Vessel DS	9.72	Port Seton
Vessel AI*	9.75	Port Seton
Vessel DO	9.79	Pittenweem
Vessel AJ*	9.85	Port Seton
Vessel DN	9.86	Port Seton
Vessel DR*	9.99	Port Seton
Vessel DP	11.33	Dunbar
Vessel DU	11.40	Pittenweem
Vessel AP*	11.48	Port Seton
Vessel AQ*	11.58	Pittenweem
Vessel AR	11.80	Dunbar
Vessel AS*	11.90	Port Seton
Vessel AB*	11.98	Arbroath
Vessel AU*	12.23	Port Seton
Vessel AV	12.47	Eyemouth
Vessel C*	12.94	Pittenweem
Vessel AW*	13.10	Dunbar
Vessel AX*	13.60	Port Seton
Vessel F	13.65	Pittenweem
Vessel A*	14.33	Montrose
Vessel AY*	14.70	Montrose
Vessel AZ*	15.58	Newhaven
Vessel E	16.67	Pittenweem
Vessel BB*	17.20	Pittenweem
Vessel BC*	17.78	Port Seton
Vessel BD	18.22	Eyemouth
Vessel BE*	19.81	Eyemouth
Vessel BF*	20.43	Fisherrow
Vessel BG*	20.82	Eyemouth
Vessel BH*	21.10	Fisherrow
Vessel BI*	21.53	Eyemouth
Vessel BJ*	21.78	Eyemouth

**Table 18B.5 Specifications of Vessel C, a Pittenweem Trawler**

Fishing vessel	Vessel C
Home port	Pittenweem
Length	12.94 m
Main engine power	194 hp
Fishing association	Fishermen's Mutual Association (Pittenweem)
Typical fishing trip duration	1 day
Average steaming speed	7 knots
Seasonality of activity	Nephrops – 10 months Squid – 2 months
Average number of days fishing per year	145
Days at sea allocation	200
Trawl door dimensions	1.67 m x 1.00 m
Trawl door weight	0.303 t
Distance between doors when towing	36 m

**Table 18B.6 Visiting Vessels Reported to Target Nephrops in the Forth and Tay Area**

Vessel	Length (m)	Home port
Vessel BL	9.445	Blyth
Vessel BM	9.75	Seahouses
Vessel BN	9.90	Seahouses
Vessel BO	9.92	Amble
Vessel BP	11.88	Amble
Vessel BQ	12.08	Amble
Vessel BR	12.20	Amble
Vessel BS	13.17	Amble
Vessel BT	13.40	Buckie
Vessel BK*	13.90	Macduff
Vessel BU*	14.90	Seahouses
Vessel BV	14.95	Kirkwall
Vessel BW	14.99	Oban
Vessel BX	16.28	Seahouses
Vessel BY	16.61	Kirkwall
Vessel BZ	16.73	Amble
Vessel CA	18.59	Ardglass
Vessel CB	18.60	Buckie

### 18B.6.2 Crab and Lobster

The large majority of crab and lobster fishing grounds are located in inshore areas in the Forth and Tay area. Table 18B.7 lists the vessels known to operate creels in the vicinity of the offshore export cable corridor. The basic specifications of one of these vessels, Vessel CQ, are provided in Table 18B.8. In addition to the full-time fleet, there are also a number of part time vessels who will set creels in inshore areas during the summer months.

As the Commercial Fisheries Baseline Development Area technical report (Appendix 18A) has identified, Arbroath is the most important creel fishing port in the Forth and Tay area. Consultation with these vessels however identified that current creel grounds are not located within the offshore export cable corridor. Fishing is concentrated in inshore grounds within 2.5nm of the coast, and in offshore areas including the Bell Rock and the area of the wind farm site (pers. com. Arbroath and District Fishermen's Association, 2012).

As mentioned previously, vessels based at Dunbar are likely to fish close to the southern section of the offshore export cable corridor due to the port's close proximity to the inshore section of the corridor. There are currently around 20 full time creel vessels operating from Dunbar. In addition to crabs and lobsters, one of these vessels will also target whelks. The number of creels being set in the area has increased in recent years (pers. comm. Dunbar fishermen, 2012). Survey activity along the offshore export cable corridor in the summer of 2012 did not identify creels operated by Dunbar based vessels within the corridor (reference survey report).

Vessels operating from Port Seton and Cockenzie set creels in close vicinity to the offshore export cable landfall options. Currently five creel vessels are reported to operate out of Port Seton (pers. comm. Port Seton and Cockenzie Fishermen's Association, October 2012). Survey activity along the offshore export cable corridor in early 2012 identified three creel vessels from Port Seton and Cockenzie with creels in the near shore vicinity of the offshore export cable corridor (reference survey report).

**Table 18B.7 Vessels Reported to Target Crab and Lobster Grounds in the Vicinity of the Offshore Export Cable Corridor**

Vessel	Length (m)	Home port
Vessel CE	4.87	North Berwick
Vessel ED	5.5m	North Berwick
Vessel DV	5.65	Dunbar
Vessel DX	6.52	Port Seton
Vessel EH	6.60	Dunbar
Vessel EC	6.80	Port Seton
Vessel EI	6.90	North Berwick
Vessel EF	7.01	Dunbar
Vessel EA	7.30	North Berwick
Vessel EL	7.40	North Berwick
Vessel EG	7.49	Crail
Vessel EE	7.70	Dunbar
Vessel CQ	7.70	Pittenweem
Vessel CU	7.95	Anstruther
Vessel EB	8.04	Pittenweem
Vessel EJ	8.30	Dunbar
Vessel DY	8.30	Newhaven
Vessel DW	8.31	Dunbar
Vessel DZ	8.58	Dunbar
Vessel AE	9.26	Dunbar
Vessel DG	9.78	Dunbar
Vessel DH	9.78	Dunbar
Vessel DL	9.94	Pittenweem
Vessel DM	10.40	Pittenweem
Vessel EK	11.04	Dunbar

**Table 18B.8 Specifications of Vessel CQ, a Pittenweem Creeler**

Fishing vessel	Vessel CQ
Home port	Pittenweem
Length	7.70 m
Main engine power	120 hp
Fishing association	FAL
Typical fishing trip duration	8 hours
Typical distance steamed per trip	12 nm
Seasonality of activity	Edible crabs, lobster, velvet crabs and surf clams all year
Average number of days fishing per year	300 days per year
Pot dimensions	0.81m x 0.25m
Number of fleets	20
Fleet length	200 m
Number of pots per fleet	20
Distance between each pot	10 m
Deployment method	Directional
Typical depth fished	5 to 40 m
Bait used	Fish heads and fresh scay bait
Typical soak time	3 days

### 18B.6.3 Scallops

Vessels targeting scallops in the Forth and Tay area fall into two categories: smaller vessels with home ports based within the Forth and Tay area and larger, nomadic vessels which will variously target scallop grounds around the Scottish east and west coasts and the UK. In the case of the

smaller, locally based scallop dredgers, these vessels will be generally limited operationally to grounds in the local area, and as a result operate in the area year round. Vessels from the nomadic fleet, however, will only spend a proportion of their time in the Forth and Tay area, depending upon the productivity of grounds here and elsewhere.

Table 18B.9 lists scallop dredge vessels reported to fish grounds in the Forth and Tay area. The basic specifications of one local and one visiting vessel able to target scallops in the vicinity of the offshore export cable corridor are provided in Table 18B.10 and Table 18B.11, respectively.

**Table 18B.9 Vessels Reported to Target Scallops in the Forth and Tay Area**

Vessel	Home port	Length (m)	Grounds Targeted
Vessel N	Kirkcudbright	16.11	Around the UK
Vessel O	Kirkcudbright	18.27	Around the UK
Vessel P	Kirkcudbright	18.25	Around the UK
Vessel Q	Kirkcudbright	16.15	Around the UK
Vessel R	Kirkcudbright	17.13	Around the UK
Vessel A	Montrose	14.33	Forth and Tay
Vessel AA	Peterhead	21.00	Scottish east coast
Vessel G	Annan	19.35	Around the UK
Vessel H	Brixham	25.50	Around the UK
Vessel W	Oban	18.99	Around the UK
Vessel I	Buckie	18.17	Around the UK
Vessel J	Buckie	30.20	Around the UK
Vessel S	Kirkcudbright	23.66	Around the UK
Vessel K	Fleetwood	26.36	Around the UK
Vessel L	Fleetwood	16.89	Around the UK
Vessel X	Oban	18.90	Around the UK
Vessel T	Kirkcudbright	17.83	Around the UK
Vessel M	Girvan	18.00	Around the UK
Vessel Y	Oban	18.29	Around the UK
Vessel Z	Oban	19.00	Around the UK
Vessel U	Kirkcudbright	24.80	Around the UK
Vessel E	Pittenweem	16.67	Forth and Tay
Vessel V	Kirkcudbright	26.24	Around the UK

**Table 18B.10 Specifications of Vessel A, a Montrose Scallop Dredger**

Fishing vessel	Vessel A
Home port	Montrose
Length	14.33 m
Main engine power	310 hp
Fishing association	Northern Fisheries Producers Organisation
Typical fishing trip duration	36 to 40 hours
Typical distance steamed per trip	90 to 100nm (depends on weather)
Seasonality of activity	Scallops – all year Nephrops – 3 months during the summer Squid – 4 months during the summer
Number of dredges per side	6
Average number of days fishing per year	150 to 200 days per year
Average towing speed	2 to 2.5 knots
Average towing duration	2 to 4 hours
Average tow length	2 to 8 nm

Table 18B.11 Specifications of Vessel I, a Buckie Scallop Dredger

Fishing vessel	Vessel I
Home port	Buckie
Length	18.17 m
Main engine power	540 hp
Typical fishing trip duration	3 days
Typical distance steamed per trip	1 to 30 nm
Seasonality of activity	Scallops all year
Number of dredges per side	8
Average number of days fishing per year	240 days per year
Average towing speed	2.3 knots
Average towing duration	1 hour
Average tow length	2.5 nm

#### 18B.6.4 Squid

A number of demersal trawl vessels will reconfigure gear to target squid on a seasonal basis in the Forth and Tay area. The vessels highlighted (\*) in Table 18B.4 and Table 18B.6 are reported to target squid in the vicinity of the offshore export cable corridor. As the seasonality analysis in *Section 18B.3.2* shows, the squid fishing season is very limited and coincides with a drop in the recorded landings for nephrops in the same period.

Depending upon the productivity of the fishery and the availability of other, restricted stocks, the fishery may also be the focus of a number of visiting vessels, some of which are of the larger category of vessel.

Ongoing consultation (2010-2012) highlighted the significant annual fluctuations in the fishery, which corresponds to the statistical analysis by year previously (*Section 18B.3.1*).

#### 18B.6.5 Clams

Clams, including razor and surf clams, are targeted in coastal areas in the Forth Estuary and are considered to be located some distance from the offshore export cable corridor. There are two sites for surf clams at Pittenweem, one site for surf clams at Anstruther and one site for razor clams in Largo Bay (SEPA, 2012<sup>1</sup>). These sites are located in the north of the Forth estuary and the offshore export cable corridor does not transect or pass near to the clam beds.

<sup>1</sup> SEPA (2012) Fife Ness to Elie Shellfish Beds [online] Available at < <http://apps.sepa.org.uk/shellfish/pdf/4.pdf> > [Accessed 11 June 2012]

## 18B.7 Fishing Grounds

### 18B.7.1 Nephrops Fishing Grounds

Figure 18B.24 shows the location of nephrops grounds targeted by the local fleet, identified by a sample of nephrops fishermen, relative to the offshore export cable corridor. It can be seen that grounds are, for the most part, located in the southern Forth and Tay area, with the offshore export cable corridor transecting these grounds. Nine of the vessels sampled have identified nephrops fishing grounds through which the offshore export cable corridor passes.

### 18B.7.2 Crab and Lobster Fishing Grounds

Figure 18B.25 shows the creel fishing grounds in the Forth and Tay area, identified by a sample of creel fishermen. The majority of crab and lobster fishing grounds are located in inshore areas. Crab and lobster grounds have been identified in areas running parallel to the offshore export cable corridor and in inshore areas adjacent to the landfall sites.

### 18B.7.3 Scallop Fishing Grounds

Figure 18B.26 shows the location of scallop grounds relative to the offshore export cable corridor, identified by a sample of scallop fishermen. Scallop grounds have been identified along the northern portion of the offshore export cable corridor, in areas adjacent to the Inch Cape Offshore Wind Farm.

### 18B.7.4 Squid Fishing Grounds

As has been previously stated, squid fishing grounds are reported to vary each year. **Error! Reference source not found.** illustrates the squid fishing areas in the Forth and Tay area as identified by a sample of squid fishermen. Squid fishing occurs throughout the Forth and Tay area, in both inshore and offshore areas. Seven of the vessels sampled have identified squid fishing areas through which the offshore export cable corridor passes.

Figure 18B.24 Forth and Tay Nephrops Fishing Grounds

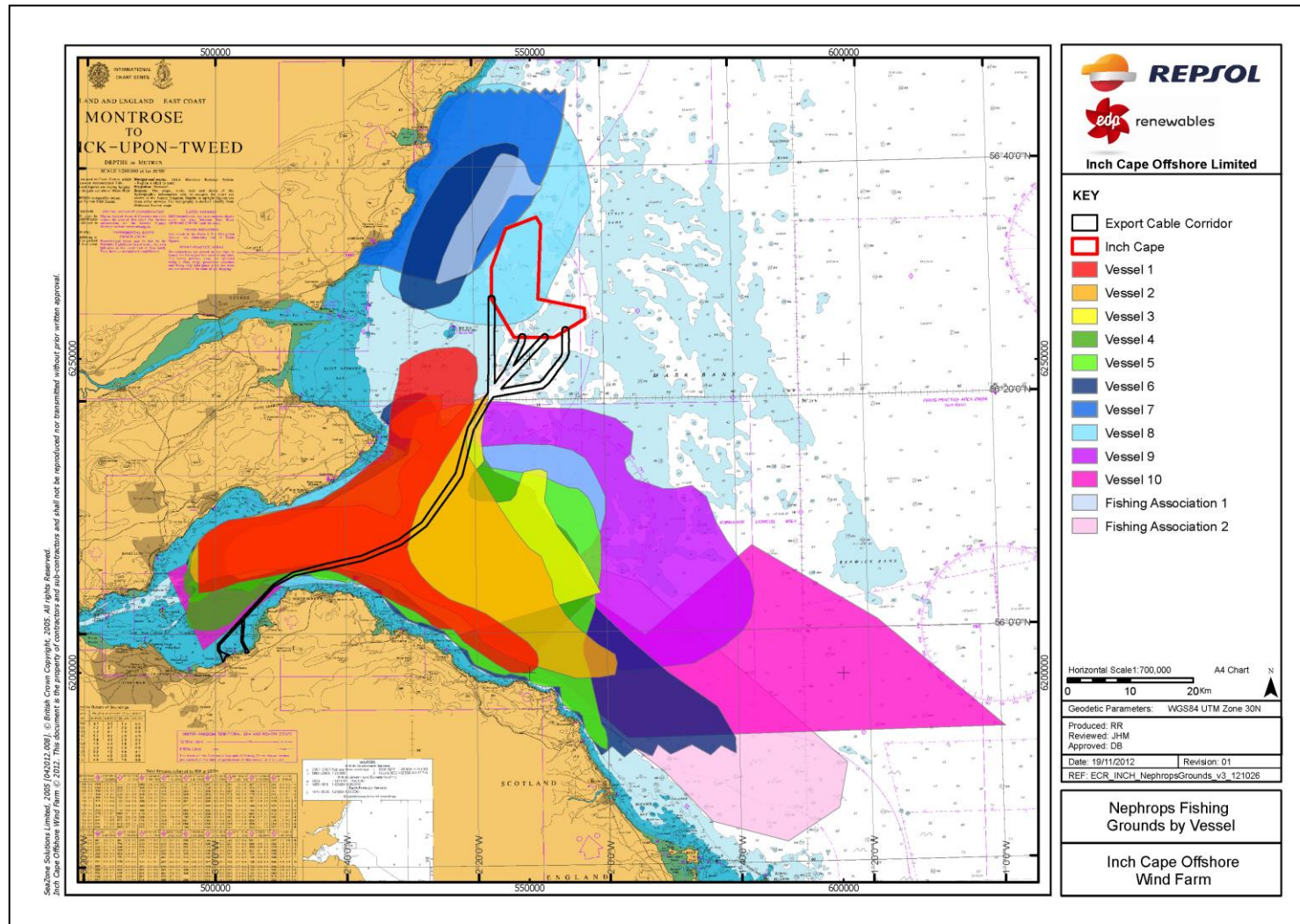


Figure 18B.25 Forth and Tay Creel Fishing Grounds

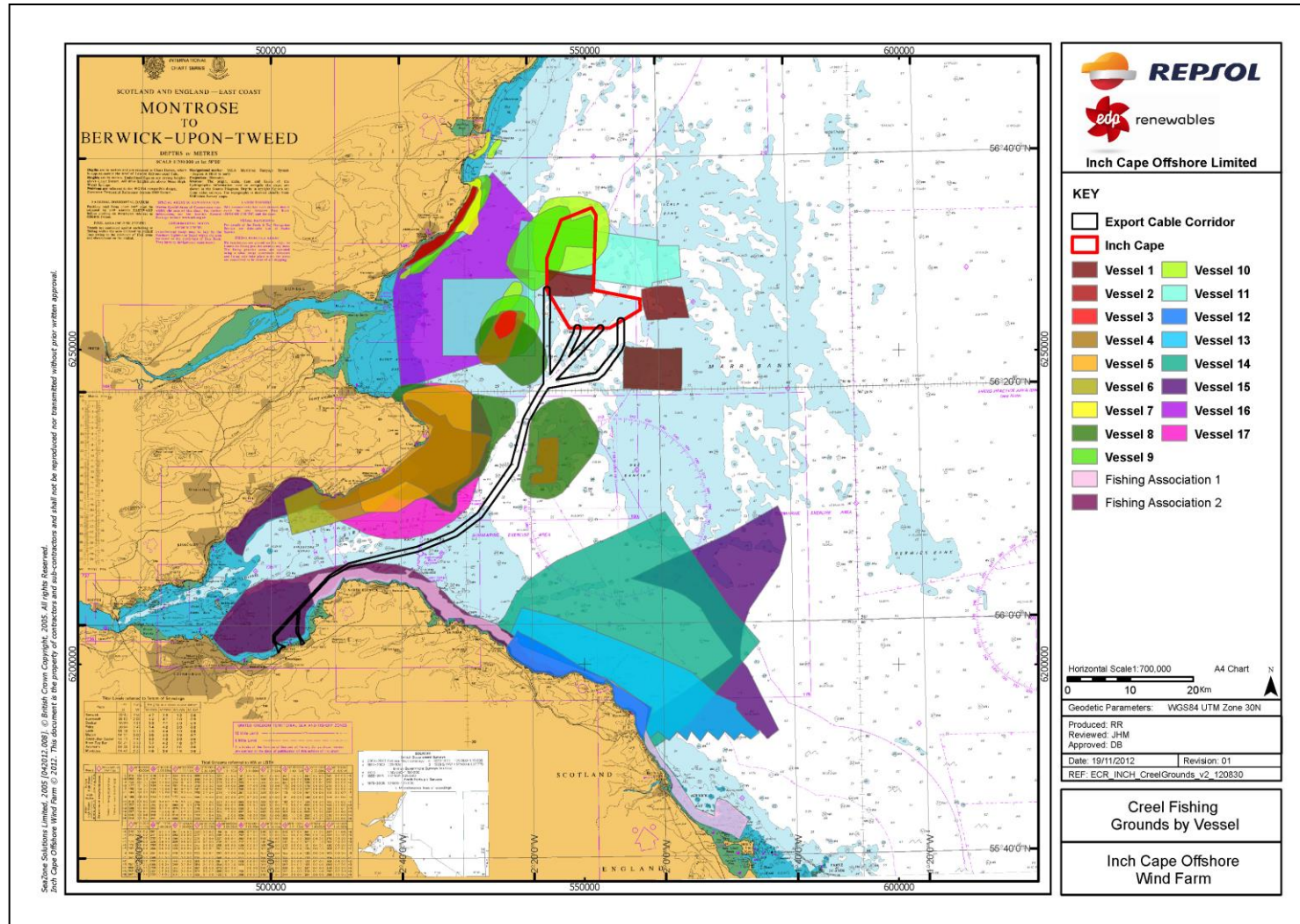


Figure 18B.26 Forth and Tay Scallop Fishing Grounds

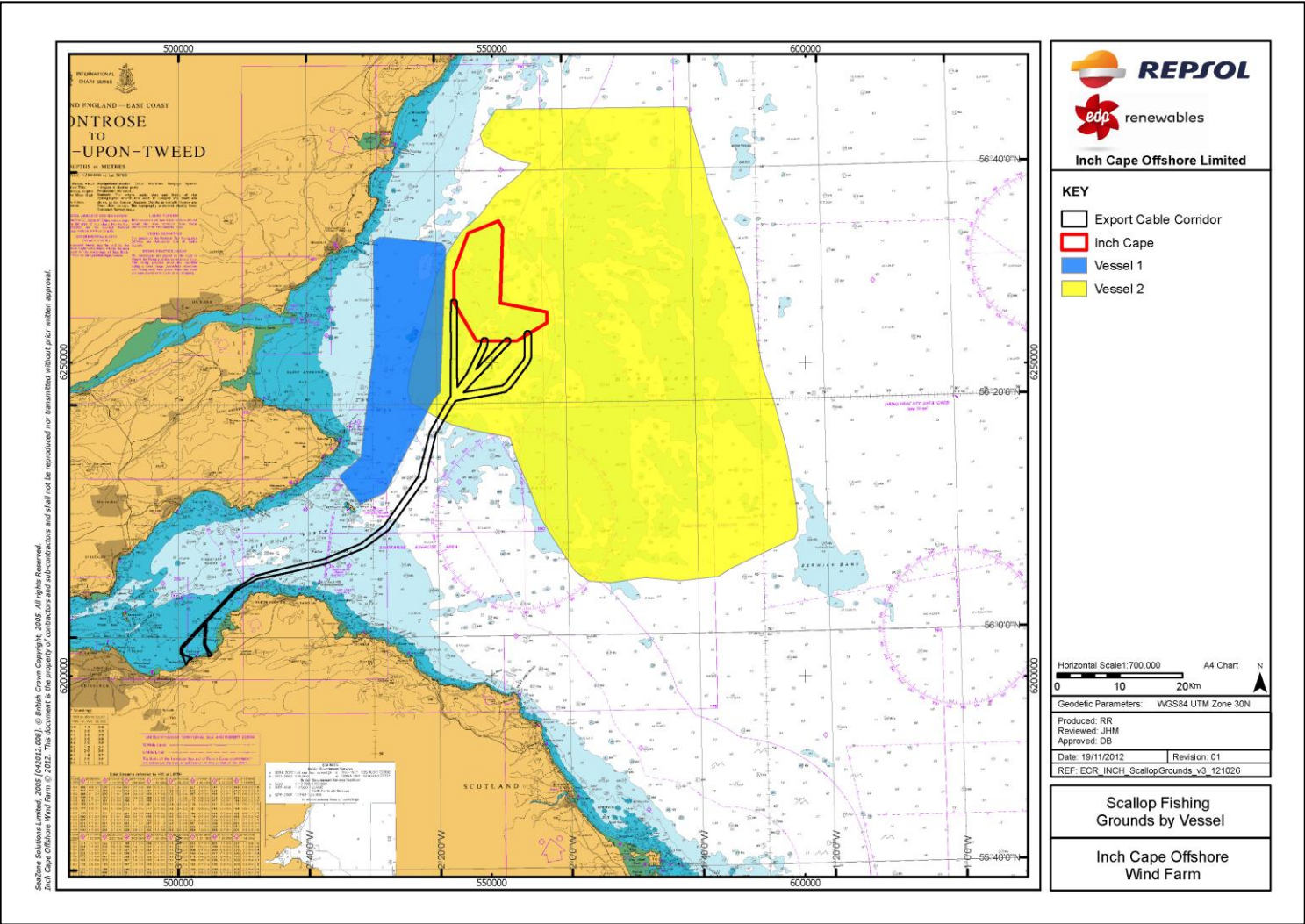
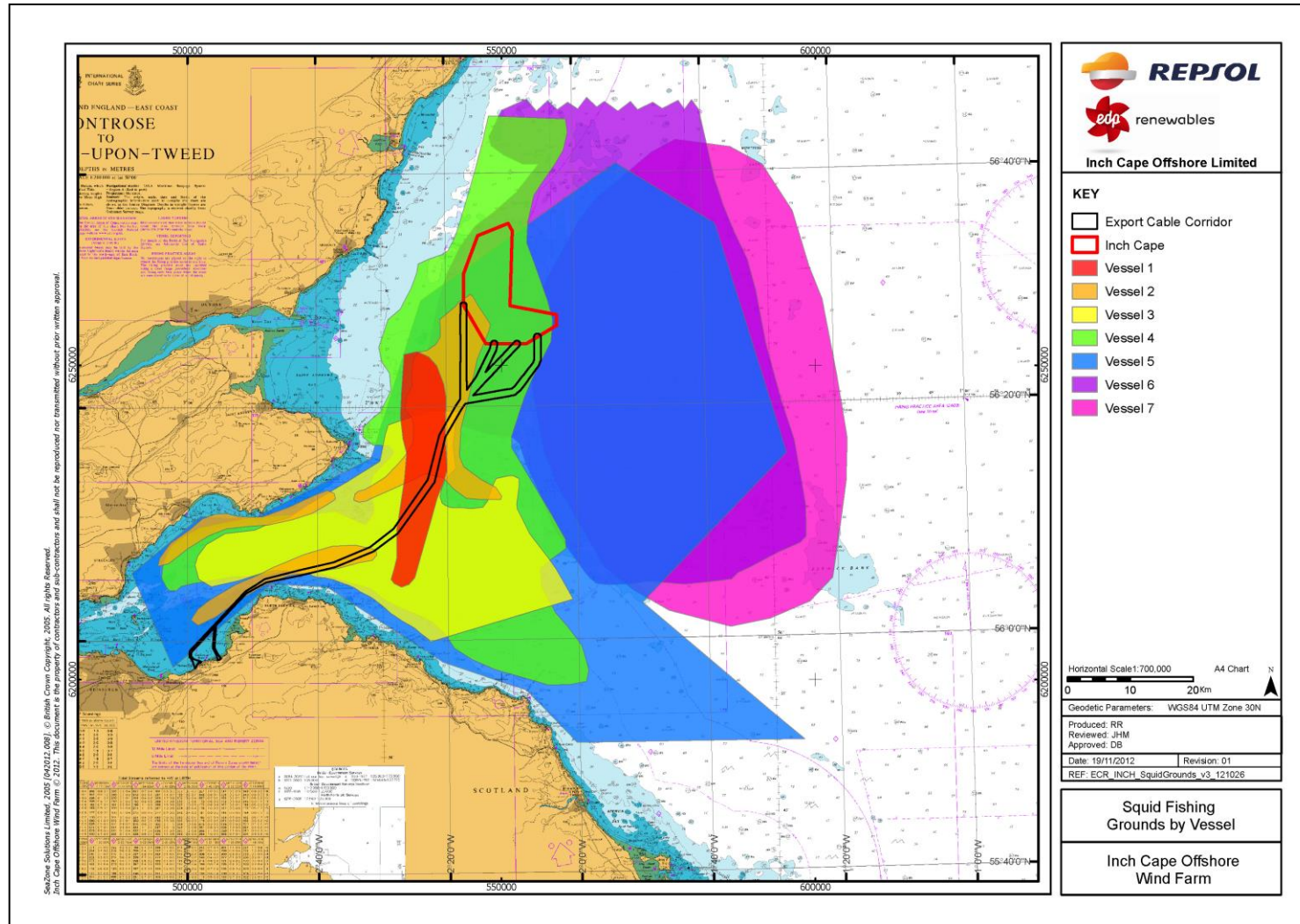


Figure 18B.27 Forth and Tay Squid Fishing Areas



## 18B.8 Future Fisheries

A short summary of potential changes to the current fishing baseline identified above that may occur in the future is provided below.

### 18B.8.1 Nephrops Fishery

Nephrops stocks in the Forth and Tay area are currently considered to be at high levels and therefore exploited sustainably (Keltz and Bailey 2012<sup>2</sup>). The nephrops quota allocation for vessels fishing within the Forth and Tay has, however, declined and it is considered that active vessels may diversify into alternative fisheries with fewer restrictions, such as squid and crustaceans. Impending changes in fisheries management policies will potentially see further changes to the fleet.

### 18B.8.2 Crab and Lobster Fishery

Crab and lobster are not currently quota or effort restricted, unlike the whitefish and nephrops fisheries, being regulated in the main by licensing and minimum landing sizes. The number of vessels targeting the fishery has broadly increased in recent years. Furthermore, it has been noted that several vessels operating in the regional study area now additionally employ creel gear to seasonally target crustaceans in addition to their target species. It is possible that the number of creel vessels will increase in the future, particularly in light of increasing restrictions upon other fisheries, unless additional management measures are implemented which will prevent this.

### 18B.8.3 Scallop Fishery

The Forth and Tay scallop fishery is reported to be fished at lower levels than grounds elsewhere, such as in the English Channel. The number of vessels in the national scallop fleet has however increased over the last ten years and scallop stocks in the Forth and Tay area are reported to be declining (Keltz and Bailey 2012<sup>2</sup>).

At present, there are no quota restrictions on scallops; landings are limited only by minimum landing size. The scallop fishery could face stricter management in the future, with Marine Scotland Science (2010) advising that restrictions are placed on the number of vessels entering the scallop fleet and increases in landing size are recommended for the future management of the fishery (Keltz and Bailey 2012<sup>2</sup>).

Gear restrictions and area closures are in place to manage the fishery in certain areas. There are currently no such closures in the Forth and Tay area however it is possible that restrictions may be imposed as a result of conservation management measures, such as those closures enforced in Cardigan Bay and the Isle of Man. Scottish scallop dredging is, however, restricted by the number of dredges which can be towed either side: a maximum of eight dredges per side inside 6nm, ten per side between 6 and 12 nm and 14 per side outside 12 nm (Keltz and Bailey 2012<sup>2</sup>). Environmental conditions are also believed to have impacted upon scallop landings, with warmer sea temperatures altering the distribution of scallop species (Shephard *et al.* 2010<sup>3</sup>).

---

<sup>2</sup> Keltz, S. and Bailey, N. (2012) Fish and Shellfish Stocks 2012. *Marine Scotland Science. The Scottish Government.*

<sup>3</sup> Shephard, S., Beukers-Stewart, B. Hiddink, J.G., Brand, A.R. and Kaiser, M.J. (2010) Strengthening recruitment of exploited scallops *Pecten maximus* with ocean warming. *Mar. Biol.* 1575: 91-97.

#### 18B.8.4 Squid Fishery

The squid fishery is a relatively new fishery to the Forth and Tay area, and future fishing practices are uncertain. It has however become an important alternative fishery for the nephrops fleet. The fishery is currently unregulated and it is possible that more fishermen will rely on this fishery to supplement their income.

Squid are seemingly resistant to fishing pressures due to their short lifespan; however squid stocks can be erratic and are sensitive to both environmental and human pressures. There are concerns over the resistance of squid stock due to increases in fishing pressure and expansion of the fishing season. Increases in sea temperature could lead to squid populations moving north (Hastie *et al.* 2009<sup>4</sup>).

---

<sup>4</sup> Hastie, L., Pierce, G., Pita, C., Viana, M., Smith, J. and Wangvoralak, S. (2009) Squid Fishing in UK Waters. *Report to SEAFISH Industry Authority*

## References

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

Kafas, A., Jones, G., Watret, R., Davies, I. and Scott, B. (2012) Representation of the use of marine space by commercial fisheries in Marine Spatial Planning. *ICES Annual Science Conference 2012* Joint ICES/PICES Session I, ICES CM code: I:23

Keltz, S. and Bailey, N. (2012) Fish and Shellfish Stocks 2012. Marine Scotland Science. *The Scottish Government*

SEPA, (2012,) Fife Ness to Elie Shellfish Beds [online]. Available at <<http://apps.sepa.org.uk/shellfish/pdf/4.pdf>> [Accessed 11 June 2012]

Shephard, S., Beukers-Stewart, B. Hiddink, J.G., Brand, A.R. and Kaiser, M.J. (2010) Strengthening recruitment of exploited scallops *Pecten maximus* with ocean warming. *Mar. Biol.* 1575: 91-97.