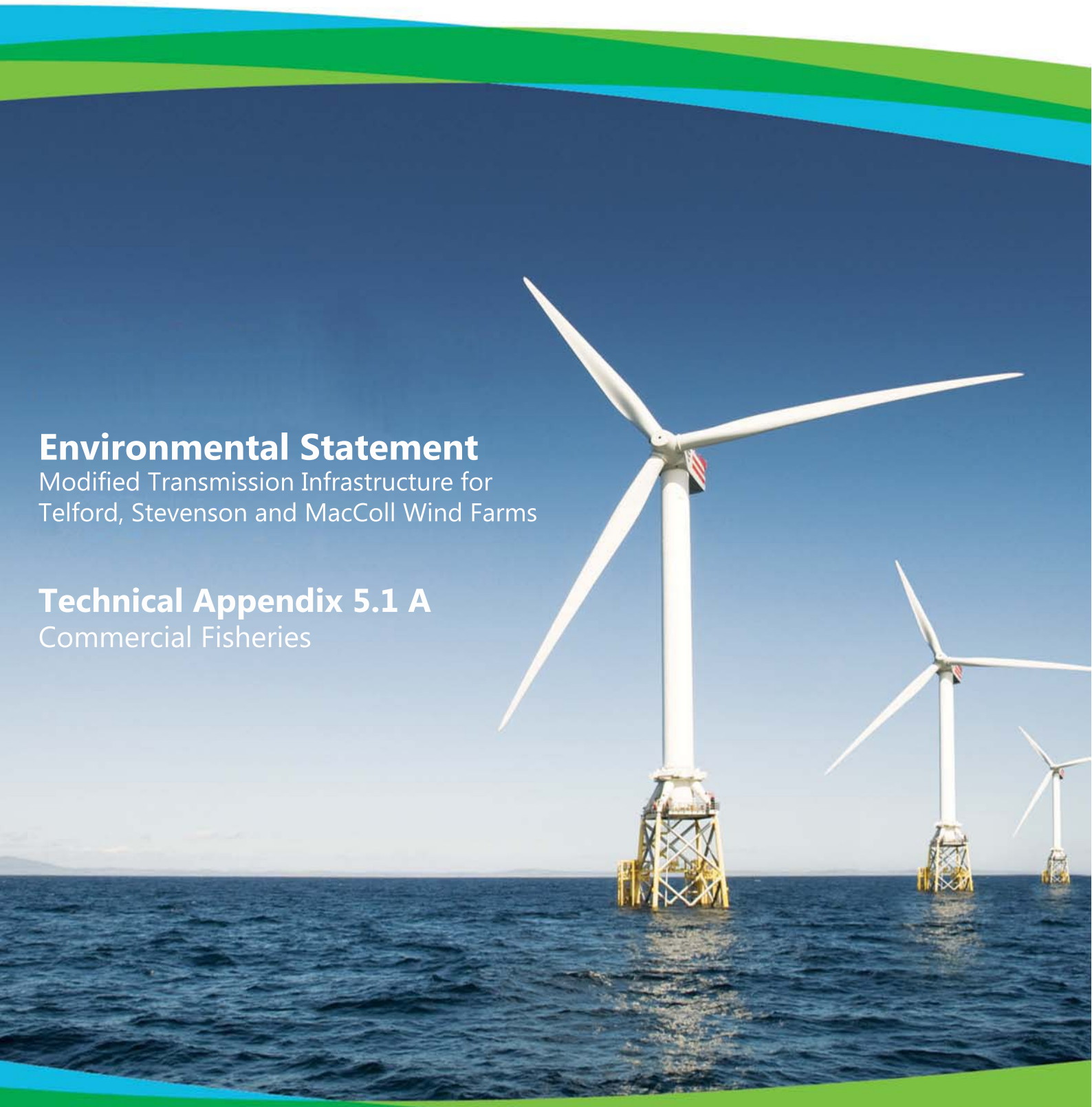
moray offshore renewables ltd

Developing Wind Energy In The Outer Moray Firth



Environmental Statement

Modified Transmission Infrastructure for
Telford, Stevenson and MacColl Wind Farms

Technical Appendix 5.1 A

Commercial Fisheries

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Brown & May Marine

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1 List of Abbreviations

BMM – Brown and May Marine

BWEA – British Wind Energy Association

Cefas – Centre for Environment, Fisheries and Aquaculture Science

CFP – Common Fisheries Policy

CPA – Coast Protection Act

DEFRA – Department for Environment, Food and Rural Affairs

EC – European Commission

EEZ – Exclusive Economic Zone

EIA – Environmental Impact Assessment

FEPA – Food and Environmental Protection Act

FIN – Fisheries Information Network

ICES – International Council for the Exploration of the Sea

MFCFWG – Moray Firth Commercial Fisheries Working Group

MMO – Marine Management Organisation

MORL – Moray Offshore Renewables Limited

MS – Marine Scotland

MSS – Marine Scotland Science

OfTI – Offshore Transmission Infrastructure

RSS – Registry of Shipping and Seamen

SFF – Scottish Fishermen's Federation

TAC – Total Allowable Catch

VMS – Vessel Monitoring System

2 Introduction

This report describes the commercial fishing activities currently being undertaken in the Moray Firth which have the potential to be impacted by the installation, operation and decommissioning of the MORL modified Offshore Transmission Infrastructure (OfTI).

The preparation of this baseline takes into account the requirements of the Food and Environmental Protection Act (FEPA) 1985, Coast Protection Act (CPA) 1949, Department for Environment, Food and Rural Affairs (DEFRA) and Centre for Environment, Fisheries and Aquaculture Science (Cefas) as specified in the 2004 Guidelines (Cefas, 2004) and British Wind Energy Association (BWEA) 2004 Recommendations (BWEA, 2004).

For the purposes of this study, commercial fishing activity is defined as any legal fishing activity undertaken for declared taxable profit. Currently, there is no single data source or recognised model for establishing commercial fishing baselines in discrete sea areas such as export cable routes. The following baseline has therefore been derived using data and information from a number of sources. Further information on these data sources is described in Section 3.

When establishing a commercial fisheries baseline it should be recognised that commercial fishing activities are not constant and fluctuate over time. Variations in landings, changes in legislation and economic constraints (e.g. fuel costs and crew availability) can all impact on fishing activities in any given area and therefore the fishing patterns and practices.

This report is supported by Technical Appendix 5.1 A (Commercial Fisheries Technical Report) of the MORL ES (MORL, 2012). The full methodology used to establish this baseline can be considered congruent with the methodology described within Appendix 5.1 A however, where necessary, additional information in respect to the methodology is provided below.

2.1 Study Area

The study area for the assessment of commercial fishing activities with regards to the modified OfTI is shown in Figure 2.1. The modified OfTI is located in International Council for the Exploration of the Sea (ICES) rectangles 44E7 and 45E7. The approach has been to assess fishing activities within four ICES rectangles (44E7, 45E7, 44E6 and 45E6) to allow fishing activities within the vicinity of the modified OfTI to be fully described.

ICES rectangles are the smallest spatial unit available for the collation of fisheries statistics. It should be noted that the area of each rectangle in the study area is much larger than the area covered by the modified OfTI. Where possible, fishing activities in the immediate area of the modified OfTI have been described in detail.

3 Data Sources, Limitations and Sensitivities

Establishing a commercial fisheries baseline requires an approach that incorporates a number of different data and information sources. Each data and information source is subject to certain limitations and sensitivities (described in more detail below) and, as a result, these data sources require separate analysis.

The principal sources of data and information used for the collation of the commercial fisheries baseline are:

- ICES;
- Marine Management Organisation (MMO);
- Marine Scotland (MS);
- Marine Scotland Science (MSS);
- District Fishery Offices;
- The Scottish Fishermen's Federation (SFF); and
- Fishermen and their representatives.

3.1 ICES

As previously stated, ICES statistical rectangles are the smallest spatial unit used for the collection and analysis of fisheries statistics by the European Commission (EC) and Member States'. ICES rectangles cover approximately 900 nm^2 and align to 30' latitude by 1° longitude.

Fishing activity within an ICES rectangle is unlikely to be evenly distributed. Analysis of fisheries statistics by ICES rectangle should therefore take into account the small proportion of a statistical area that the modified OfTI covers and the uneven distribution of activity throughout each rectangle.

3.2 Surveillance Sightings Data

As a means of fisheries protection and to ensure the fishing industry complies with UK and EU law, aircraft and surface vessels are used to compile surveillance sightings of fishing vessels in UK waters. The data has been used to give a relative spatial distribution of fishing activity by method and nationality within a given area. It should be noted that, due to the low frequency of flights in an area, which are generally weekly and only occur during daylight hours, the sightings data should not be used to give a quantitative assessment of fishing activity. The MMO has provided sightings of all fishing vessels in UK waters by nationality and method.

3.3 Fisheries Statistics

UK fisheries statistical data for a five year period between 2008 and 2012 has been collected by the MMO by ICES rectangles for all UK and non-UK vessels landing into UK ports. The data includes landings by value and effort (days fished). This data set has been analysed to identify:

- Species targeted;
- Fishing methods used;
- Vessel categories (under-10 m, 10-15 m, over-15 m);
- Annual variations;
- Seasonal variations;
- Landings values;
- Fishing effort; and
- Landings values and effort by port.

The main source of fisheries landing data is the EC daily log sheets that all vessels over-10 m must complete and submit. Fishing vessels under-10 m in length are not required to submit daily log sheets, although skippers can choose to do so.

Dockside inspections are made on the under-10 m fleet by local fisheries officers. The Shellfish Entitlement Scheme (2004) and the 'Registration of Buyers and Sellers of First Sale Fish and Designation Auction Site Scheme' (2005) further facilitate collection of fisheries data from the under-10 m fleet. It should be noted that data collected prior to the introduction of these schemes may underestimate the true levels of activity from the under-10 m fleet. It should also be recognised that under these schemes, fishermen are required only to identify the ICES sub-area within which catch was taken and not the specific ICES rectangle. Catches, effort and values by the under-10 m fleet are allocated to ICES rectangles on the basis of best estimate.

3.4 Satellite Tracking (VMS) Data

3.4.1 MMO

Vessel Monitoring System (VMS) data is the most comprehensive fisheries data set currently available which shows the intensity of over-15 m fishing vessel activity. Since January 2005, all EC vessels over-15 m 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 authority. The MMO monitors all UK vessels irrespective of location and all foreign vessels within the UK Exclusive Economic Zone (EEZ). Information regarding non-UK vessels cannot be disclosed by the MMO without prior permission from the vessels national regulating body.

The satellite data has been cross-referenced with landings and effort data to give values in a 0.05° by 0.05° grid for the years 2008 to 2012. The disclosure of independent UK vessels' identities is restricted under the Data Protection Act (1998) and the coordinates of individual vessels are only available at the request of the vessels skipper/owner. Any rectangles that record less than five transmissions are not included in the data set and specific fishing methods have not been identified; instead the type of method (mobile or static) has been defined. All vessels that are stationary in port have not been included in the data set and the VMS data does not differentiate between vessels fishing and steaming. As a result the data has been filtered by speed, with vessels travelling at speeds of between 1-6 knots included (Lee *et al.*, 2010).

Due to VMS only applying to vessels over-15 m in length, activity by vessels under-15 m will not be represented in the analysis. As of 2012, EU legislation will require all Member State vessels over-12 m in length to have VMS installed. Due to the release dates of data however, data from the over-12 m fleet will not be included in this assessment.

3.4.2 Marine Scotland Science

MSS has provided VMS data (2007 to 2011) to Brown and May Marine (BMM) to aid in the establishment of a coherent fisheries baseline. The VMS data was produced by applying VMS records to the Fisheries Information Network (FIN), which is the Scottish Government's sea fisheries database. FIN holds information on voyages (catches, gear and mesh size) and landings (weight, price at sale). Both the VMS records and FIN database use the Registry of Shipping and Seamen (RSS) number, which identifies vessels (this identifier is otherwise protected information) as a common denominator. Logtime (the date and time of each VMS transmission) identifies each vessel's voyage and enables the location of a vessel during each trip to be linked to the gear used and the weight of the landings (Holmes *et al.*, 2011). A collection of weight and value rules separate the data into groups representing key sectors of the UK fishing fleet such as crab, lobster, squid, *Nephrops* (mobile and static), demersal (mobile and static), scallop and pelagic (mackerel and herring) (Kafas *et al.,* 2012).

As with the MMO data set, the data has been filtered by speed with vessels travelling at speeds of between 1 and 6 knots presumed to be fishing (Lee *et al.*, 2010). As previously stated, VMS records do not capture vessels under-15 m and so may not represent the true extent of fishing activities in a given area.

3.5 ScotMap

ScotMap data was collected by MSS and provides spatial information on fishing activity of Scottish registered commercial fishing vessels under-15 m in length. Data was collected through interviews between June 2011 and December 2012 which compiled fisheries information over the past five years (2007 to 2011). The data collected was aggregated and analysed to provide information on the monetary value, number of fishing vessels and crew by fishery.

The data set is based on interviews of 1,090 fishermen, however not all fishermen initially targeted for the ScotMap project were interviewed (72% vessel coverage overall) and not all those interviewed provided earnings information (10% earnings disclosure decline rate overall). Individuals also defined their fishing areas with variable levels of precision.

3.6 Fishermen and Fishermen's Representatives

Consultation on the Telford, Stevenson and MacColl wind farms, in addition to further consultation on the modified TI, has been undertaken with individual skippers and their representatives. Despite extensive consultation through open and advertised fisheries stakeholder meetings and comprehensive field work, it is possible that certain individuals and some unaffiliated stakeholders may not have been included in the assessment.

4 Stakeholder Consultation

4.1 Scoping Responses

The MORL modified Transmission Infrastructure Scoping Report was distributed to commercial fisheries stakeholders in April 2014. A summary of the scoping responses of particular relevance to commercial fisheries is presented in Table 1. This table includes those consultees who raised concerns with respect to the installation, operation and decommissioning of the modified OfTI.

Table 1: Summary of Relevant Scoping Responses

Organisation	Scoping Response	Addressed
MSS	There are substantial locally important shellfish fisheries for brown crab and lobster. These predominantly consist of small vessels (<15 m in length) that do not have VMS aboard. However, ScotMap project should be used as primary source of information on the potential overlap of the spatial distribution of smaller vessels with the proposed site. In general, these vessels work mainly between 0-6 nm from the shore. There is a very active small boat fleet working in the area mainly potting, but also an active summer hand-line fishery for mackerel.	ScotMap data has been used to show the monetary value and number of vessels for creeling, mackerel lining, *Nephrops* trawling and other trawling (i.e. non-*Nephrops*). It should be noted that the scallop data set was analysed, however no values were recorded in the Moray Firth and as such this data set has not been include in the report. Further details on ScotMap can be found in Section 5.5 of this report. In addition to ScotMap, fishing grounds have been collected through consultation and these are detailed in Section 5.6 of this report.
MSS	VMS vessel fishery data indicates the key target species as *Nephrops*, (mainly in the eastern part of the Firth), scallops (both closer to the shore and within the development) and some demersal whitefish species (further offshore). There is an increasing importance of squid in the Moray Firth as there are fewer restrictions on vessels targeting this species. As a result more vessels have been moving to target squid seasonally to alleviate pressure on other stocks and save days at sea for other Total Allowable Catch (TAC) species.	MSS VMS data has analysed by fishery in the Moray Firth and is discussed in Section 5.4 of this report. Consultation has been undertaken with the skippers of vessels who target squid; further details can be found in Section 5.6.3 of this report.

Organisation	Scoping Response	Addressed
MSS	It would be worth ensuring good contact is made and consultation maintained with fisheries representatives in the area. This is especially important for the non-VMS vessels which are not represented by the VMS data plots. Points of contact other than the Scottish Fisherman's Federation (SFF) may include local fishery offices and the inshore fisheries group coordinator for the Moray Firth.	Consultation has been undertaken with fishermen and their representatives in the Moray Firth, including the local fishery offices and inshore fisheries group. A summary of the consultation is provided in Table below.
Scottish Fishermen's Federation	The SFF note that the proposal allows for up to 4 transmission cables. We would expect these to be buried as far as possible at a depth to ensure minimum risk from snagging or changes in seabed as a result of tidal movement. Where this is not technically possible consultation on alternatives and mitigation proposals must be decided and agreed through the Moray Firth Commercial Fisheries Working Group which must include those potentially affected by the cable route.	The potential impacts of the cables to commercial fishing activity along with the appropriate mitigation methods (including cable burial and discussion through the Moray Firth Commercial Fisheries Working Group (MFCFWG)) are assessed in the ES Chapter 5; Section 5.1.2.
Scottish Fishermen's Federation	The SFF are content with the definition given in Chapter 3, page 35 on the cumulative and in combination impacts, and expect to see these clearly illustrated along with any necessary mitigation.	The cumulative and in combination impacts to commercial fishing activity are assessed in this ES Chapter 5; Section 5.1.3.
Scottish Fishermen's Federation	The SFF are content with the baseline fisheries given in Chapter 5.3.2 and vessel activity in 5.3.3. If that knowledge is properly applied to the cable route as far as scallop activity to the North and South, Nephrops & demersal en route, squid and static gear to the South, we are confident that any negative impacts on fishing will become clear and that appropriate mitigation measures will be developed.	The potential impacts of subsea cables to commercial fishing activity along with appropriate mitigation measures are assessed in this ES Chapter 5; Section 5.1.2

4.2 Consultation

Consultation was initially undertaken in 2011 with the organisations listed in Table 2 below. Where applicable, consultees have been approached to provide updated information relevant to the modified OfTI.

Table 2: List of Consultees

Organisation	Consultation Response
Scottish Fishermen's Federation	Inputs into baseline, ongoing consultation.
Scallop Association	Inputs into baseline, ongoing consultation.
Caithness Static Gear Fishermen's Association	Inputs into baseline, ongoing consultation.
Fishermen's Association Limited	Inputs into baseline, ongoing consultation.
North East Inshore Fisheries Group	Inputs into baseline, ongoing consultation.
Marine Scotland	Inputs into baseline, ongoing consultation.
Scrabster Fishery Office	Inputs into baseline, ongoing consultation.
Buckie Fishery Office	Inputs into baseline, ongoing consultation.
Aberdeen Fishery Office	Inputs into baseline, ongoing consultation.
Full-time Creelers from Buckie, Portsoy, Banff, Whitehills and Fraserburgh	Inputs into baseline, ongoing consultation.

5 Baseline Environment

5.1 Fisheries Controls and Legislation

The fisheries controls and legislation are as described in the Technical Appendix 5.1 A (Commercial Fisheries Technical Report) of the MORL ES (MORL, 2012). Where necessary, updates to the controls and legislation are provided below.

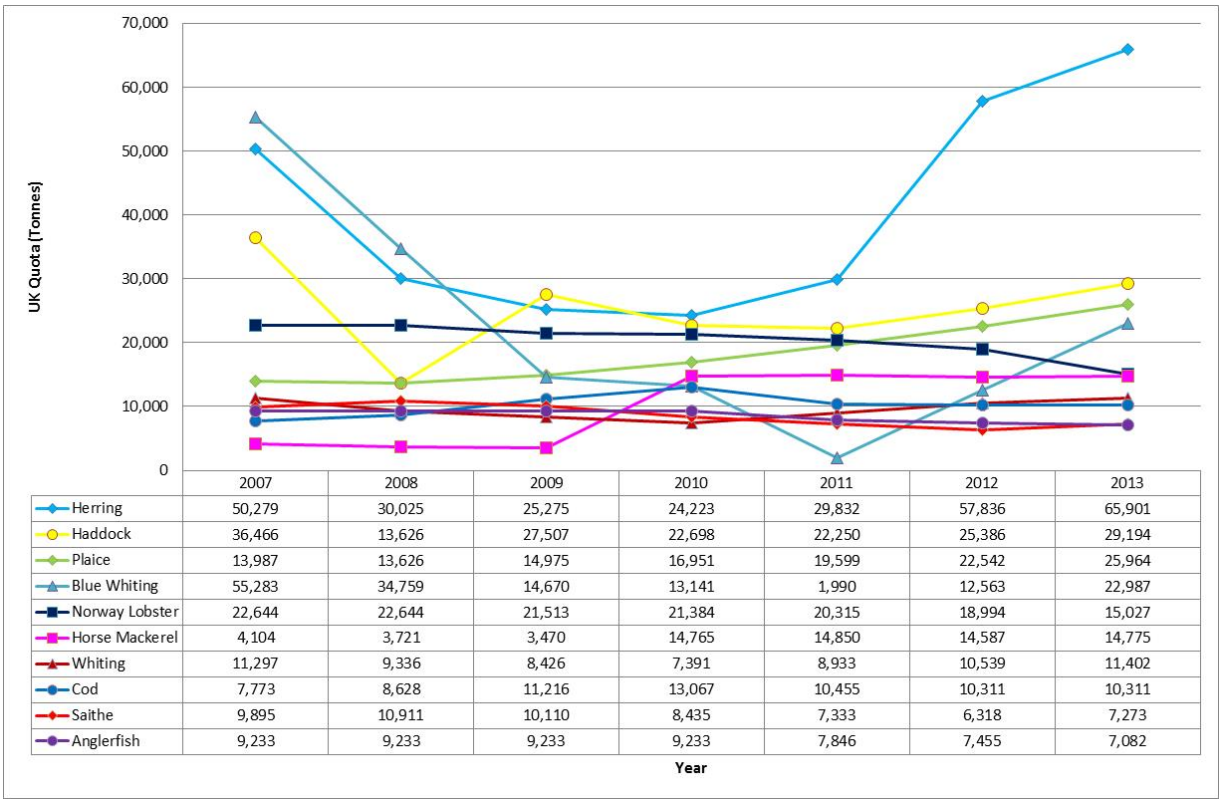
5.1.1 Common Fisheries Policy

As described in the Technical Appendix 5.1 A (Commercial Fisheries Technical Report) of the MORL ES (MORL, 2012), the Common Fisheries Policy (CFP) has primarily dictated the structure and capacity of the UK and Scottish fishing fleets. In February 2013, the European Parliament voted for a reform of the CFP, including measures to protect endangered stocks and the ending of discards. The new CFP will begin to come into practice in 2014, with the current policy stipulating that between 2015 and 2020, catch limits should be set that are sustainable and maintain fish stocks in the long term. The new CFP also seeks to make fishing fleets more selective in what they catch and to phase out the practice of discarding unwanted fish. These new measures are likely to impact the fishing patterns and practices of the vessels described in Section 5.6 below.

5.1.2 Quota Restrictions

As discussed in the Technical Appendix 5.1 A (Commercial Fisheries Technical Report) of the MORL ES (MORL, 2012), quota for fish stocks in Scottish waters are managed and controlled by the Scottish Executive. Figure 5.1 shows the TAC for the UK in ICES area IV (North Sea). It can be seen that herring currently records the largest TAC and, although there was an initial decline at the beginning of the period, the quota has increased in recent years.

Demersal species such as haddock, plaice, whiting and cod and pelagic species such as blue whiting and horse mackerel constitute a significant proportion of TACs for the UK. *Nephrops* (Norway lobster) is also a species of national importance in the North Sea, although it should be noted that the quota for this species declined in recent years.



	2007	2008	2009	2010	2011	2012	2013
Herring	50,279	30,025	25,275	24,223	29,832	57,836	65,901
Haddock	36,466	13,626	27,507	22,698	22,250	25,386	29,194
Plaice	13,987	13,626	14,975	16,951	19,599	22,542	25,964
Blue Whiting	55,283	34,759	14,670	13,141	1,990	12,563	22,987
Norway Lobster	22,644	22,644	21,513	21,384	20,315	18,994	15,027
Horse Mackerel	4,104	3,721	3,470	14,765	14,850	14,587	14,775
Whiting	11,297	9,336	8,426	7,391	8,933	10,539	11,402
Cod	7,773	8,628	11,216	13,067	10,455	10,311	10,311
Saithe	9,895	10,911	10,110	8,435	7,333	6,318	7,273
Anglerfish	9,233	9,233	9,233	9,233	7,846	7,455	7,082

Year

Figure 5.1: TACs (Top 10 Species) in ICES Area IV (North Sea), UK only, 2007-2013

5.2 Surveillance Sightings

Figure 5.2 gives the positions of vessels identified by fisheries surveillance officers in the study area, by method, between 2008 and 2012. Vessels of all lengths are recorded. Sightings are concentrated in the south and east of the study area and the density of sightings within the vicinity of the modified OfTI are moderate. The majority of vessels sighted in the vicinity of the modified OfTI are demersal trawlers, with seine netters, scallop dredgers and creelers also identified.

5.3 Landings Data

The average landings values (2008 to 2012) of UK vessels in the Moray Firth by species, method and vessel size are shown in Figures 5.3-5.5.

Within the Moray Firth, the main target species are *Nephrops*, squid and scallops; the majority of this activity occurs along the southern Moray coast. The modified OfTI is located in two ICES rectangles, 44E7 and 45E7, and these rectangles record moderate to high landings values.

Rectangle 44E7 records the highest landings values in the study area; the majority of these values are recorded by vessels bottom otter trawling and, to a lesser extent, twin trawling, predominantly for *Nephrops* (46.9%). Squid and haddock (25.6% and 7.7%, respectively) also contribute to the landings values recorded by vessels deploying these methods. Scallops contribute 7.7% of the landings from this rectangle with vessels deploying boat dredges. The majority of vessels operating in this rectangle are over-15 m in length, although over a quarter of vessels are under-15 m in length.

Records show that moderate landings are made within ICES rectangle 45E7, with scallops contributing 50.8% of the landings in this rectangle. Squid, haddock and *Nephrops* (18.7%, 12.9% and 10.3%

respectively) comprise the remainder of the landings values and these are recorded by vessels deploying bottom otter trawls. A high proportion of the vessels operating in this rectangle are over-15 m in length.

In the inner Firth (44E6), the composition of landings is similar to that of 44E7 with *Nephrops* and squid comprising the majority of the landings, albeit recording slightly lower values. In the north-west of the Moray Firth, the majority of activity is recorded by vessels deploying pots (creels), targeting lobster, edible crab and, to a lesser extent, velvet crab. Scallops are also targeted in this rectangle by vessels deploying boat dredges.

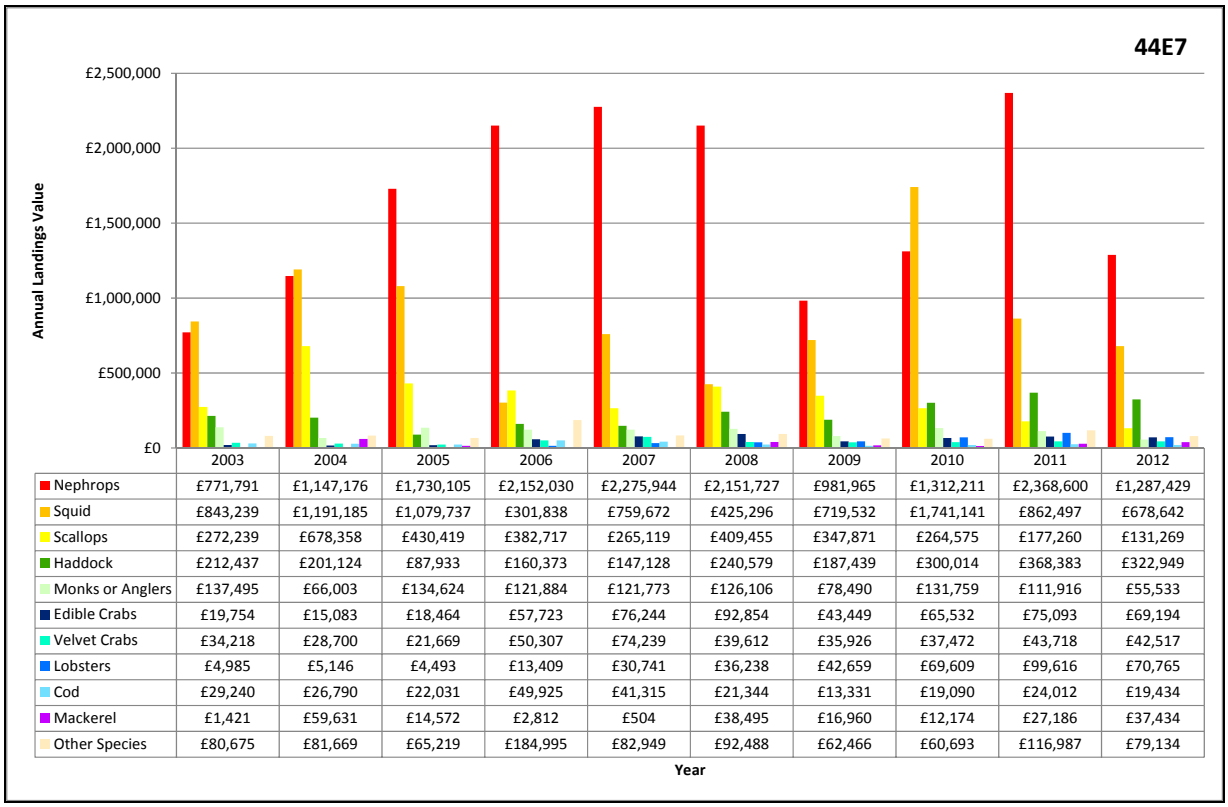
Figure 5.6 shows annual effort by method in the Moray Firth. As can be seen in the figure, the distribution of activity broadly correlates to that of landings, with the exception of 45E7, which records the lowest effort in the area. It should also be noted that vessels creeling record significantly higher levels of effort in rectangles 44E7, 44E6 and 45E6, when compared to landings values. This reflects the higher effort relative to low value fishery.

5.3.1 Annual and Seasonal Variation

Figures 5.7 and 5.8 show the annual variations in landings values by species in rectangles 44E7 and 45E7, respectively, between 2003 and 2012.

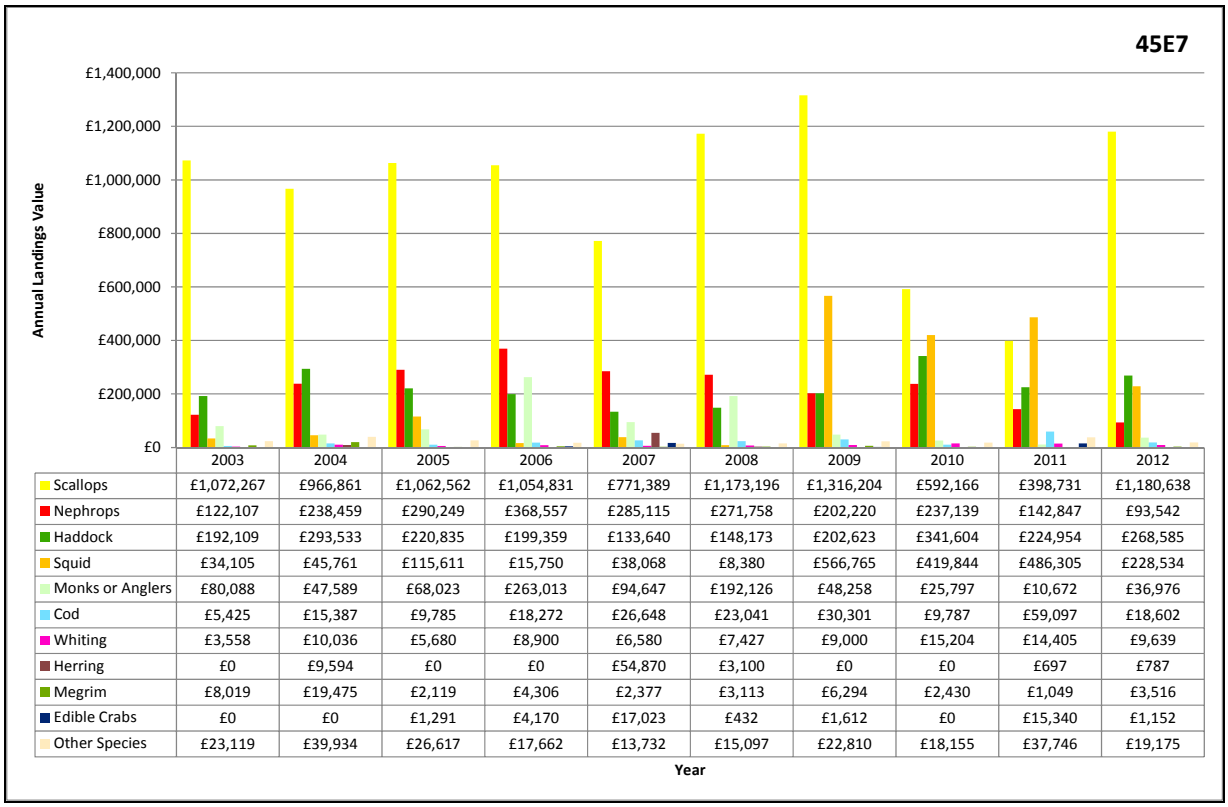
In rectangle 44E7, the total landings values increased between 2003 and 2008, followed by a sharp decline in 2009. Values since 2009 have, however, shown an increase. The highest values have been recorded by vessels targeting *Nephrops* and squid, with the highest values for these two species recorded in 2011 and 2010, respectively. All others species, with the exception of edible crab, lobster and velvet crab, have shown minor fluctuations over this timeframe. Crab, lobster and velvet crab have shown notable increases in landings values after 2006 due to the changes in fishery management (as discussed in Section 3.3, previously).

In rectangle 45E7, scallops record the highest landings values and, with the exception of 2010 and 2011, landings for this species have remained stable. The highest landings for scallops were recorded in 2009 followed by 2012. Squid landings values have also fluctuated over the ten year period, with a high of over £500,000 recorded in 2009 and the lowest values (less than £10,000) recorded in 2008. This reflects the unpredictable nature of the fishery which is described in more detail in the Technical Appendix 5.1 A (Commercial Fisheries Technical Report) of the MORL ES (MORL, 2012). The landings values of other species recorded in this rectangle have fluctuated slightly over the period, but have generally remained stable. Throughout the ten year period, there have been sporadic landings of herring recorded in this rectangle, with landings in the value of over £50,000 recorded during 2007.



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Nephrops	£771,791	£1,147,176	£1,730,105	£2,152,030	£2,275,944	£2,151,727	£981,965	£1,312,211	£2,368,600	£1,287,429
Squid	£843,239	£1,191,185	£1,079,737	£301,838	£759,672	£425,296	£719,532	£1,741,141	£862,497	£678,642
Scallops	£272,239	£678,358	£430,419	£382,717	£265,119	£409,455	£347,871	£264,575	£177,260	£131,269
Haddock	£212,437	£201,124	£87,933	£160,373	£147,128	£240,579	£187,439	£300,014	£368,383	£322,949
Monks or Anglers	£137,495	£66,003	£134,624	£121,884	£121,773	£126,106	£78,490	£131,759	£111,916	£55,533
Edible Crabs	£19,754	£15,083	£18,464	£57,723	£76,244	£92,854	£43,449	£65,532	£75,093	£69,194
Velvet Crabs	£34,218	£28,700	£21,669	£50,307	£74,239	£39,612	£35,926	£37,472	£43,718	£42,517
Lobsters	£4,985	£5,146	£4,493	£13,409	£30,741	£36,238	£42,659	£69,609	£99,616	£70,765
Cod	£29,240	£26,790	£22,031	£49,925	£41,315	£21,344	£13,331	£19,090	£24,012	£19,434
Mackerel	£1,421	£59,631	£14,572	£2,812	£504	£38,495	£16,960	£12,174	£27,186	£37,434
Other Species	£80,675	£81,669	£65,219	£184,995	£82,949	£92,488	£62,466	£60,693	£116,987	£79,134

Figure 5.7: Annual Variation in Landings Values by Species in ICES Rectangle 44E7 (source: MMO)



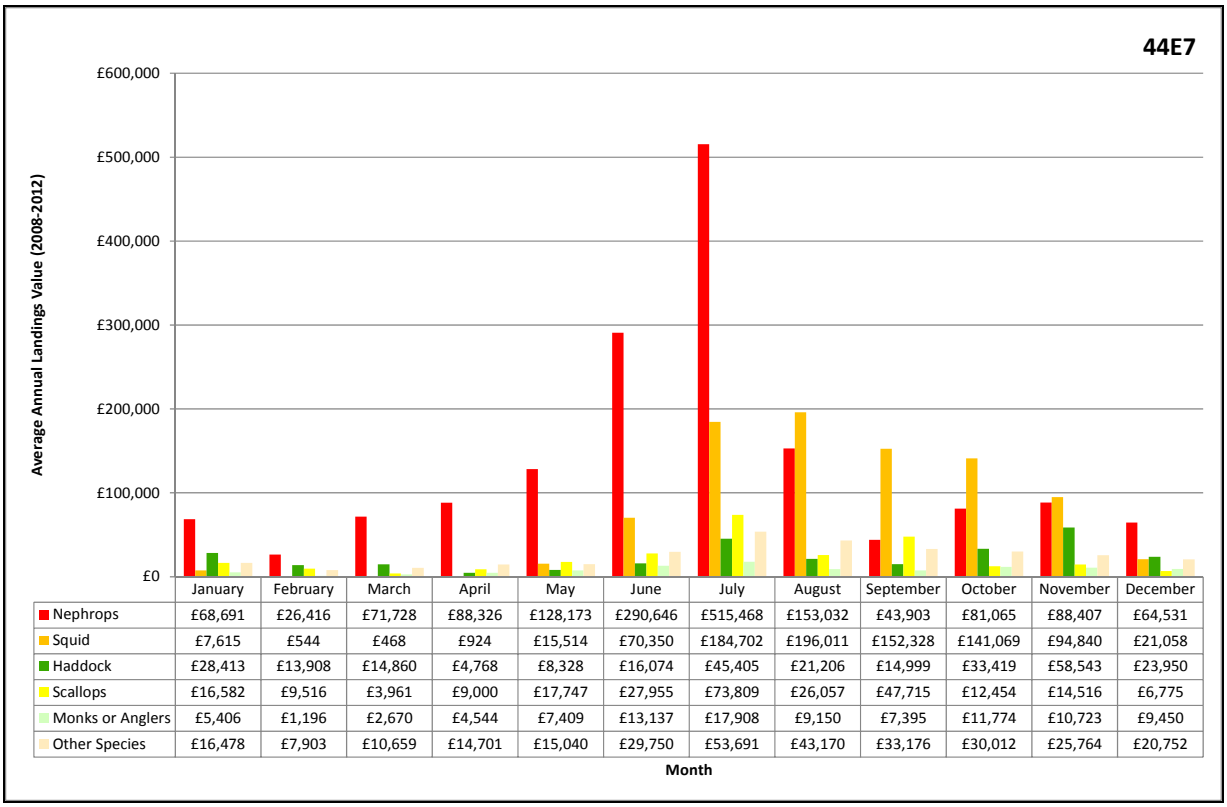
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Scallops	£1,072,267	£966,861	£1,062,562	£1,054,831	£771,389	£1,173,196	£1,316,204	£592,166	£398,731	£1,180,638
Nephrops	£122,107	£238,459	£290,249	£368,557	£285,115	£271,758	£202,220	£237,139	£142,847	£93,542
Haddock	£192,109	£293,533	£220,835	£199,359	£133,640	£148,173	£202,623	£341,604	£224,954	£268,585
Squid	£34,105	£45,761	£115,611	£15,750	£38,068	£8,380	£566,765	£419,844	£486,305	£228,534
Monks or Anglers	£80,088	£47,589	£68,023	£263,013	£94,647	£192,126	£48,258	£25,797	£10,672	£36,976
Cod	£5,425	£15,387	£9,785	£18,272	£26,648	£23,041	£30,301	£9,787	£59,097	£18,602
Whiting	£3,558	£10,036	£5,680	£8,900	£6,580	£7,427	£9,000	£15,204	£14,405	£9,639
Herring	£0	£9,594	£0	£0	£54,870	£3,100	£0	£0	£697	£787
Megrim	£8,019	£19,475	£2,119	£4,306	£2,377	£3,113	£6,294	£2,430	£1,049	£3,516
Edible Crabs	£0	£0	£1,291	£4,170	£17,023	£432	£1,612	£0	£15,340	£1,152
Other Species	£23,119	£39,934	£26,617	£17,662	£13,732	£15,097	£22,810	£18,155	£37,746	£19,175

Figure 5.8: Annual Variation in Landings Values by Species in ICES Rectangle 45E7 (source: MMO)

Figures 5.9 and 5.10 show the average landings values (2008 to 2012) by seasonality in rectangles 44E7 and 45E7, respectively.

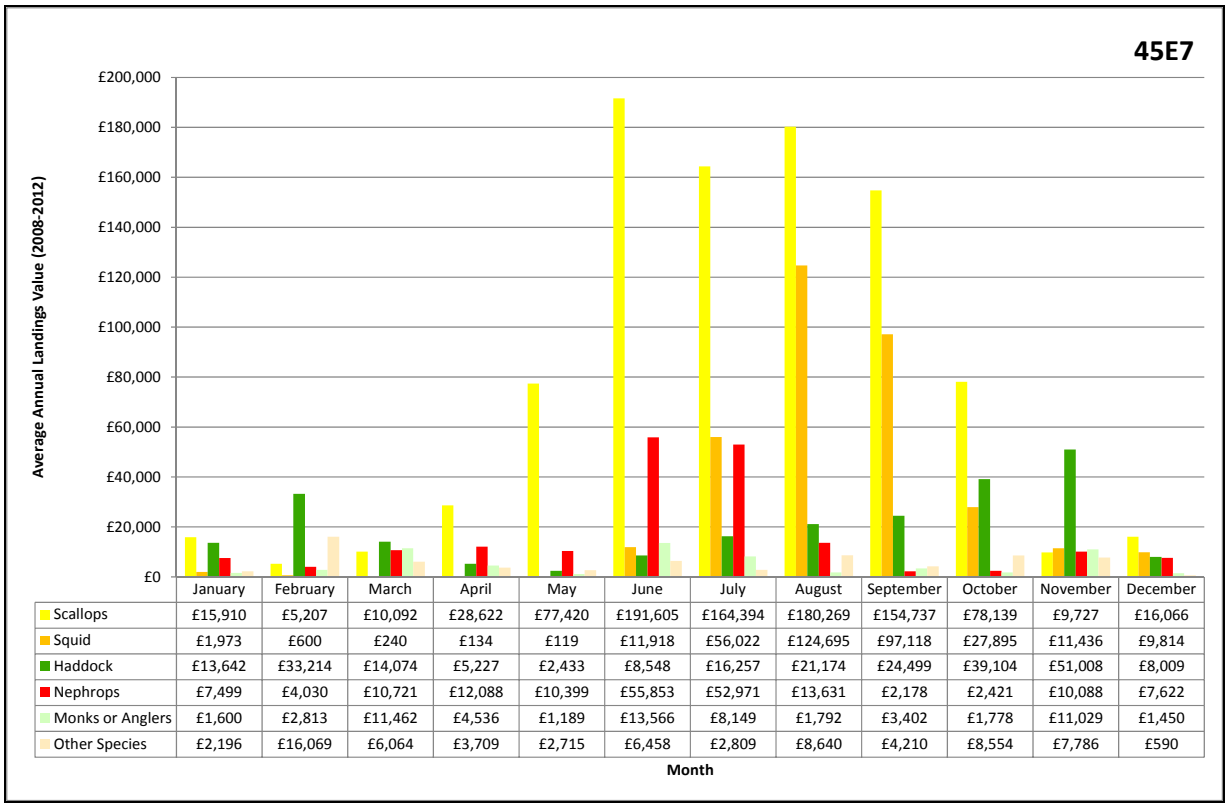
As can be seen in rectangle 44E7, *Nephrops* are targeted year round with the highest landings recorded in June and July. Squid are predominantly targeted between June and November, with low landings values recorded in the spring and winter months. Landings values recorded by vessels catching haddock remain constant throughout the year with peaks in November and July. Scallops are targeted year round with the highest landings recorded in July and September. The landings of monkfish/anglerfish generally remain constant year round.

In rectangle 45E7, scallops are caught throughout the year with the majority of landings recorded from late spring to autumn. As with 44E7, squid are targeted between June and November. Haddock are targeted year round with a peak in landings in October and November, although February also records notable landings of haddock. The highest landings of *Nephrops* are recorded in June and July. The landings values of monkfish/anglerfish are sporadic throughout the year with March, June, July and November recording the highest values.



	January	February	March	April	May	June	July	August	September	October	November	December
Nephrops	£68,691	£26,416	£71,728	£88,326	£128,173	£290,646	£515,468	£153,032	£43,903	£81,065	£88,407	£64,531
Squid	£7,615	£544	£468	£924	£15,514	£70,350	£184,702	£196,011	£152,328	£141,069	£94,840	£21,058
Haddock	£28,413	£13,908	£14,860	£4,768	£8,328	£16,074	£45,405	£21,206	£14,999	£33,419	£58,543	£23,950
Scallops	£16,582	£9,516	£3,961	£9,000	£17,747	£27,955	£73,809	£26,057	£47,715	£12,454	£14,516	£6,775
Monks or Anglers	£5,406	£1,196	£2,670	£4,544	£7,409	£13,137	£17,908	£9,150	£7,395	£11,774	£10,723	£9,450
Other Species	£16,478	£7,903	£10,659	£14,701	£15,040	£29,750	£53,691	£43,170	£33,176	£30,012	£25,764	£20,752

Figure 5.9: Average (2008 to 2012) Seasonal Variations in Landings Values by Species in ICES Rectangle 44E7 (source: MMO)



	January	February	March	April	May	June	July	August	September	October	November	December
Scallops	£15,910	£5,207	£10,092	£28,622	£77,420	£191,605	£164,394	£180,269	£154,737	£78,139	£9,727	£16,066
Squid	£1,973	£600	£240	£134	£119	£11,918	£56,022	£124,695	£97,118	£27,895	£11,436	£9,814
Haddock	£13,642	£33,214	£14,074	£5,227	£2,433	£8,548	£16,257	£21,174	£24,499	£39,104	£51,008	£8,009
Nephrops	£7,499	£4,030	£10,721	£12,088	£10,399	£55,853	£52,971	£13,631	£2,178	£2,421	£10,088	£7,622
Monks or Anglers	£1,600	£2,813	£11,462	£4,536	£1,189	£13,566	£8,149	£1,792	£3,402	£1,778	£11,029	£1,450
Other Species	£2,196	£16,069	£6,064	£3,709	£2,715	£6,458	£2,809	£8,640	£4,210	£8,554	£7,786	£590

Figure 5.10: Average (2008 to 2012) Seasonal Variations in Landings Values by Species in ICES Rectangle 45E7 (source: MMO)

5.3.2 Port Data Analysis

The main ports by landings values for rectangles 44E7 and 45E7, and the percentage of each ports total income that this represents are listed in Tables 3 and 4.

In rectangle 44E7, the highest percentage of landings values are recorded into the port at Fraserburgh (65.3%) which represents 5.1% of the ports' total annual average income. The ports of Buckie, Macduff and Banff record lower proportions of the total landings values from 44E7 (21.7%, 7.7% and 0.1%, respectively), however this represents 31.9%, 26.5% and 27.3% of each ports total average annual landings values.

In rectangle 45E7, the highest percentage of landings values are recorded into the port at Fraserburgh (42.8%) which represents 1.8% of the ports' total annual average income. The ports of Buckie and Wick record lower proportions of the total landings values from 45E7 (29.4% and 11.8%, respectively), however this represents 22.9% and 15.9% of each ports total average annual landings values.

Table 3: Top Ports by Landings Value from ICES Rectangle 44E7 (source: MMO)

Port	Average Annual Landings Values (£) in 44E7 (2008-2012)	% of Annual Value in 44E7	Total Average Annual Port Value (2008-2012)	% of Total Annual Port Value that 44E7 Represents
Fraserburgh	£2,258,915	65.3%	£44,550,372	5.1%
Buckie	£750,579	21.7%	£2,350,538	31.9%
Macduff	£266,963	7.7%	£1,007,739	26.5%
Peterhead	£110,254	3.2%	£112,801,781	0.1%
Portknockie	£13,068	0.4%	£15,064	86.8%
Burghead	£8,950	0.3%	£674,097	1.3%
Gardenstown	£7,405	0.2%	£29,747	24.9%
Ullapool	£5,045	0.1%	£10,443,473	0.0%
Scrabster	£4,934	0.1%	£21,940,641	0.0%
Whitehills	£4,797	0.1%	£38,301	12.5%
Aberdeen	£4,604	0.1%	£3,222,380	0.1%
Banff	£3,280	0.1%	£12,030	27.3%
Lossiemouth	£2,575	0.1%	£117,947	2.2%
Wick	£2,464	0.1%	£1,368,682	0.2%
Kinlochbervie	£2,307	0.1%	£11,769,852	0.0%
Lochinver	£2,222	0.1%	£6,209,857	0.0%
Portsoy	£2,070	0.1%	£9,729	21.3%
Mallaig	£1,373	0.0%	£8,995,289	0.0%
Eyemouth	£1,354	0.0%	£2,975,422	0.0%
Rosehearty	£1,150	0.0%	£13,629	8.4%

Table 4: Top Ports by Landings Value from ICES Rectangle 45E7 (source: MMO)

Port	Average Annual Landings Values (£) in 45E7 (2008-2012)	% of Annual Value in 45E7	Total Average Annual Port Value (2008-2012)	% of Total Annual Port Value that 45E7 Represents
Fraserburgh	£784,327	42.8%	£44,550,372	1.8%
Buckie	£538,505	29.4%	£2,350,538	22.9%
Wick	£217,197	11.8%	£1,368,682	15.9%
Peterhead	£139,359	7.6%	£112,801,781	0.1%
Macduff	£87,012	4.7%	£1,007,739	8.6%
Scrabster	£29,361	1.6%	£21,940,641	0.1%
Ullapool	£17,722	1.0%	£10,443,473	0.2%
Mallaig	£4,008	0.2%	£8,995,289	0.0%
Lochinver	£3,737	0.2%	£6,209,857	0.1%
Aberdeen	£3,435	0.2%	£3,222,380	0.1%
Kinlochbervie	£2,302	0.1%	£11,769,852	0.0%
Montrose	£1,349	0.1%	£365,173	0.4%
Burghead	£1,113	0.1%	£674,097	0.2%
Helmsdale	£1,022	0.1%	£234,225	0.4%
Inverness	£921	0.1%	£30,404	3.0%
Stromness	£593	0.0%	£1,983,667	0.0%
Lybster	£570	0.0%	£378,654	0.2%
Brora	£320	0.0%	£100,804	0.3%

Port	Average Annual Landings Values (£) in 45E7 (2008-2012)	% of Annual Value in 45E7	Total Average Annual Port Value (2008-2012)	% of Total Annual Port Value that 45E7 Represents
Lerwick	£215	0.0%	£50,515,944	0.0%
Kirkwall	£129	0.0%	£1,817,081	0.0%

5.4 VMS Data

The VMS density of all UK over-15 m vessels by average landings values (2008 to 2012) and effort (average days fished; 2008 to 2012) is shown in Figure 5.11 and 5.12, respectively.

The highest levels of fishing intensity and effort over the period are located in the south of the Moray Firth, including the area in which the modified OfTI is located.

Figures 5.13 to 5.18 were provided to BMM by MSS to assist in the establishment of a comprehensive commercial fisheries baseline. As with the MMO VMS data, there are limitations associated with the interpretation of the data set; principally that it is only representative of the over-15 m fleet. It should also be noted that dense areas of activity recorded around the ports of Peterhead and Fraserburgh are likely to be vessels steaming into the ports rather than fishing.

Figures 5.13 to 5.18 show the distribution of grounds by relative average value (2007 to 2011) of vessels targeting *Nephrops*, scallops, squid, demersal fish species, herring and pelagic species, respectively.

Figure 5.13 shows *Nephrops* are targeted in the south of the Moray Firth with the modified export cable route passing through moderate to high value grounds. An area of higher value is located to the north-east.

Scallop dredging activity occurs throughout the Moray Firth (Figure 5.14), with areas of high value located in the northern portion of the modified OfTI corridor (the majority of which is located within the three consented wind farm boundaries), and to the east and north of the consented sites. Moderate values are recorded in the southern section of the modified export cable route corridor, along the southern coastline.

Figure 5.15 shows the distribution of squid fishing grounds for the over-15 m fleet. Activity is limited with the highest values recorded to the east of the modified OfTI and very low values recorded within the modified export cable route corridor.

Demersal fishing activity is shown in Figure 5.16. The highest value areas are recorded off the coast at Peterhead and Fraserburgh, although as noted previously, it is likely that this is vessels steaming into port after fishing grounds further offshore. Low to moderate value fishing grounds are located in the northern section of the modified OfTI corridor, with moderate activity recorded to the north of the three consented wind farms.

Figure 5.17 and 5.18 show the landings values of herring and other pelagic species, respectively. Very high value areas are located offshore of the ports of Fraserburgh and Peterhead. As discussed previously, this is likely to be vessels steaming into the ports rather than fishing. Pelagic fishing grounds are often located much further offshore. Some low value herring grounds are located to the north and north-east of the three consented wind farms.

5.5 ScotMap

Figures 5.19 and 5.20 show the relative monetary value of fishing activity and number of vessels operating in the Moray Firth, respectively, for the under-15 m fleet.

The highest landings values of fishing activity by the under-15 m fleet in the Moray Firth occurs in inshore areas, with low landings values recorded in the central portion of the Moray Firth. The landings values in the vicinity of the modified OfTI are moderate compared to those in the south-east and north-west of the Moray Firth.

Moderate to high numbers of under-15 m vessels operate throughout the majority of the Moray Firth, with lower numbers recorded in the outer Moray Firth. The inshore portion of the modified export cable route corridor records high numbers of vessels, with the numbers decreasing further offshore.

Figures 5.21 and 5.22 show landings values and number of over-15 m vessels in the Moray Firth targeting *Nephrops*, respectively. Low to moderate landings values of *Nephrops* are recorded in the Moray Firth and this is reflected in the number of vessels fishing in the area. The majority of these landings and vessels are recorded in the inner Moray Firth, with low landing values and number of vessels recorded within the modified export cable route corridor.

The landings values and number of trawlers (targeting species other than *Nephrops*) are shown in Figures 5.23 and 5.24, respectively. It should be noted that these figures contain information relating to vessels targeting squid and whitefish. As can be seen in the figures, the highest landings values and number of vessels are recorded along the southern Moray Firth coast. Records show moderate landings values and vessel numbers for the area of the modified OfTI.

Figures 5.25 and 5.26 show the landings values and number of vessels creeling in the Moray Firth, respectively. Moderate to high landings values are recorded along the north and south Moray Firth coastlines, with no landings recorded in offshore areas. Despite moderate to high landings values being recorded in the area, low numbers of vessels are recorded as deploying creels. Records show low to moderate landings values and low numbers of vessels in the area of the modified export cable route corridor.

The landings values of the mackerel fishery and number of vessels targeting mackerel in the Moray Firth is shown in Figures 5.27 and 5.28, respectively. As can be seen in the figures, mackerel is targeted off the north-east Aberdeenshire coast between Gardenstown and Peterhead. Moderate to high landings values and number of vessels are recorded in this area. Within the vicinity of the modified export cable route corridor, low to moderate landings values and number of vessels are recorded.

5.6 Fishing Vessels, Patterns and Practices

Commercial fisheries in the Moray Firth are targeted by both local and visiting vessels. For the purposes of this report, local vessels are considered to be those based at home ports within the Moray Firth, which are often under-15 m in length and as a result are limited in their operational range. Visiting vessels are generally considered to target grounds elsewhere but will be seasonally present in the Moray Firth. Although not exclusively so, these vessels are generally over-15 m in length.

The modified OfTI is located in the vicinity of grounds targeted by vessels described below; it should however be noted that the modified OfTI constitutes only a small percentage of the total area fished by these vessels and even less in the case of visiting vessels.

A description of each gear type can be found in the Technical Appendix 5.1 A (Commercial Fisheries Technical Report) of the MORL ES (MORL, 2012).

5.6.1 Nephrops

The majority of vessels targeting *Nephrops* in the Moray Firth have home ports in the area, although it is possible that visiting vessels may occasionally target the fishery. Vessels reported to target *Nephrops* in the Moray Firth are listed in Table 5 below. All of the vessels below are also able to reconfigure their gear to target the squid fishery.

The specifications and operating practices of a sample of these vessels can be found in the Technical Appendix 5.1 A (Commercial Fisheries Technical Report) of the MORL ES (MORL, 2012).

Table 5: Vessels reported to target *Nephrops* in the Moray Firth

Vessel Name	Reg. No.	Home Port	Length
Boy Bryan	B 756	Burghead	11.35 m
Carona	WY 786	Buckie	9.80 m
Charisma	BF 296	Macduff	14.10 m
Freeward	IH 264	Burghead	9.95 m
Incentive	BCK 41	Buckie	8.10 m
Jenna Maree	BCK 621	Burghead	9.90 m
Just Reward	BF 64	Macduff	13.90 m

Figure 5.29 shows the location of *Nephrops* grounds targeted by the under-15 m fleet, identified by a sample of *Nephrops* fishermen, relative to the modified OfTI. It can be seen that grounds are, for the most part, located in the southern Moray Firth particularly in areas in the inner Firth. One of the vessels sampled has identified *Nephrops* fishing grounds through which the modified export cable route corridor passes, with another fishing ground within the MacColl consented wind farm boundary.

Consultation with the SFF confirmed that over-15 m vessels will fish grounds through which the modified export cable route corridor passes. Under-15 m vessels will also fish these grounds in favourable weather conditions (Marine Scotland VMS); however the majority of their grounds are located within the inner Firth (ScotMap).

5.6.2 Scallops

Vessels targeting scallops in the Moray Firth fall into two categories: smaller vessels with home ports based within the Moray Firth and larger, nomadic vessels which will variously target scallop grounds around the UK. Table 6 lists scallop dredge vessels reported to fish grounds in the Moray Firth.

The specifications and operating practices of a sample of these vessels can be found in the Technical Appendix 5.1 A (Commercial Fisheries Technical Report) of the MORL ES (MORL, 2012).

Table 6: Vessels Reported to Target Scallops in the Moray Firth

Vessel Name	Reg. No.	Home Port	Length	Grounds Targeted
Academus	BA 817	Kirkcudbright	16.11 m	Around the UK
Albion	DS10	Kirkcudbright	34.90 m	Around the UK
Aquinis	BA 500	Kirkcudbright	18.27 m	Around the UK
Argonaut	BA 858	Kirkcudbright	23.96 m	Around the UK
Argosy	BA 804	Kirkcudbright	18.25 m	Around the UK
Atlantic Belle	N 80	Kirkcudbright	18.27 m	Around the UK

Vessel Name	Reg. No.	Home Port	Length	Grounds Targeted
Aztec	BA 224	Kirkcudbright	16.15 m	Around the UK
Azula	BA 70	Kirkcudbright	17.13 m	Around the UK
Clasina	DS 15	Kirkcudbright	28.04 m	Around the UK
Charity & Liberty	DS 4	Kirkcudbright	14.95 m	Around the UK
Cordelia K	INS 151	Avoch	40.27 m	Around the UK
Cornelis Gert Jan	GY 98	Kirkcudbright	12.00 m	Around the UK
Crimson Arrow	OB 128	Oban	16.96 m	Around the UK
Crystal Dawn	CN 20	Islay	14.95 m	Around the UK
Emerald Dawn	BCK 303	Islay	23.00 m	Around the UK
Evening Star	PD 1022	Peterhead	21.00 m	Scottish east coast
Fredwood	BA 338	Annan	19.35 m	Around the UK
Geertruida	OB 99	Oban	18.99 m	Around the UK
George Lou-n	TN 38	Kirkcudbright	25.50 m	Around the UK
Georgelou-N	TN 38	Annan	25.50 m	Around the UK
Georgia Dawn	INS 140	Avoch	18.00 m	Around the UK
Honeybourne	PD 905	Kirkcudbright	29.16 m	Around the UK
Isla S	DS 1	Kirkcudbright	40.11 m	Around the UK
Jann Denise	FR 80	Oban	16.51 m	Around the UK
Kayleigh M	K 970	Islay	13.10 m	Around the UK
Kelly	BCK 625	Buckie	18.17 m	Around the UK
Kestrel	BCK 81	Buckie	30.20 m	Around the UK
Kilwarlin	B 910	Burntisland	20.29 m	Scottish east coast
King Challenger	BA 87	Kirkcudbright	21.30 m	Around the UK
King Explorer	BA 829	Kirkcudbright	23.66 m	Around the UK
Kingfisher	BA 810	Kirkcudbright	22.94 m	Around the UK
Maggie Ann	FR 110	Fraserburgh	26.60 m	Around the UK
Mary Manson	OB 19	Oban	17.80 m	Around the UK
Mattanja	TN 36	Annan	32.50 m	Around the UK
Natalie B	H 1074	Fleetwood	26.36 m	Around the UK
Noordzee	TN 30	Annan	31.10 m	Around the UK
Olivia Jean	TN 35	Annan	33.86 m	Around the UK
Our Heritage	FR 237	Fleetwood	16.89 m	Around the UK
Philomena	TN 37	Annan	30.57 m	Around the UK
Queensberry	BA 156	Annan	15.90 m	Around the UK
Rois Mhalri	OB 45	Oban	18.90 m	Around the UK
Sardonyx II	WK 350	Wick	11.45 m	Moray Firth
Saturnus	KY 43	Kirkcudbright	24.00 m	Around the UK
Sea Lady	TN 20	Annan	32.80 m	Around the UK
Silvia Bowers	DS 8	Kirkcudbright	36.75 m	Around the UK
Southards	WK 913	Wick	16.40 m	Around the UK
St Amant	BA 101	Kirkcudbright	17.83 m	Around the UK
St Apollo	BA 359	Girvan	18.00 m	Around the UK
Star of Annan	OB 50	Oban	18.29 m	Around the UK

Vessel Name	Reg. No.	Home Port	Length	Grounds Targeted
Star of Jura	OB 278	Oban	19.00 m	Around the UK
Susan Bird	FD 357	Kirkcudbright	24.80 m	Around the UK
Tjeerd Jacoba	BS 186	Kirkcudbright	25.30 m	Around the UK
Torbach-N	TN 2	Annan	23.07 m	Around the UK
Vertrouwen	DS 11	Kirkcudbright	26.24 m	Around the UK

Figure 5.30 shows the location of scallop grounds relative to the modified OfTI, identified by a sample of fishermen. Scallop grounds have been identified in areas throughout the three consented wind farm boundaries, with the modified export cable route corridor passing through grounds identified by one vessel along the southern coast.

5.6.3 Squid

A number of demersal trawl vessels will reconfigure gear to target squid on a seasonal basis in the Moray Firth. Depending upon the productivity of the fishery and the availability of other, restricted stocks, the fishery may be the focus of a number of visiting vessels, some of which are of the larger category of vessel, up to 26 m in length. Table 7 lists vessels which are reported to target squid in the Moray Firth.

The specifications and operating practices of a sample of these vessels can be found in the Technical Appendix 5.1 A (Commercial Fisheries Technical Report) of the MORL ES (MORL, 2012).

Table 7: Vessels reported to target Squid in the Moray Firth

Vessel Name	Reg. No.	Home Port	Length	Target Species	Local or Visiting Vessel
Boy Bryan	B 756	Burghead	11.35 m	Nephrops	Local
Boy Paul	BM 477	Peterhead	9.70 m	Whitefish	Visiting Vessel
Carona	WY 786	Buckie	9.80 m	Nephrops	Local
Charisma	BF 296	Macduff	14.10 m	Nephrops	Local
Deeside	BCK 595	Buckie	24.00 m	Whitefish	Local
Freeward	IH 264	Burghead	9.95 m	Nephrops	Local
Incentive	BCK 41	Buckie	8.10 m	Nephrops	Local
Jenna Maree	BCK 621	Burghead	9.90 m	Nephrops	Local
Just Reward	BF 64	Macduff	13.90 m	Nephrops	Local
Norlantean II	K 508	Kirkwall	27.80 m	Whitefish	Visiting Vessel
Ocean Venture	PD 340	Peterhead	30.50 m	Whitefish	Visiting Vessel
Prospect	BF 573	Macduff	20.60 m	Whitefish	Local
Shalimar	BCK 598	Buckie	21.72 m	Whitefish	Local

As has been previously stated, squid fishing grounds are reported to vary each year. Figure 5.31 illustrates the squid fishing grounds in the Moray Firth, identified by a sample of squid fishermen. Squid fishing grounds are located throughout the Firth, in both inshore and offshore areas.

5.6.4 Whitefish

There are five vessels reported to target whitefish in the vicinity of the Moray Firth, as well as in other areas around the UK (Table 8). It should be noted that whitefish activity in the vicinity of the modified OfTI is very low relative to fishing grounds elsewhere.

Table 8: Vessels reported to target Whitefish in the Moray Firth

Vessel Name	Reg. No.	Home Port	Length
Boy Andrew	WK 170	Wick	26.00 m
Deeside	BCK 595	Buckie	24.00 m
Opportune	WK 171	Wick	25.90 m
Prospect	BF 573	Macduff	20.60 m
Shalimar	BCK 598	Buckie	21.72 m

Figure 5.32 shows whitefish fishing grounds. Grounds are located to the north of the Moray Firth and in coastal areas to the south-east. None of the vessels sampled have identified whitefish fishing grounds through which the modified export cable route corridor passes.

5.6.5 Crab and Lobster

Crab and lobster fishing grounds are in the main located in inshore areas in the Moray Firth. There are seven full time creel vessels reported to target crab and lobsters in the area around the modified export cable route landfall (Table 9). The vessel specifications and fishing practices of two local creel vessels are given in Table 10. There are also a number of part time vessels who will set a small number of creels in inshore areas during the summer months.

Table 9: Vessels reported to target Crab and Lobster Grounds in the vicinity of the Modified Export Cable Route Corridor

Vessel	Reg. No.	Vessel Length
Helena	BF 2	7.90 m
Halcyon II	BF 500	7.32 m
Sea Shell	BF 23	6.92 m
Confidence	BF 600	5.96 m

Table 10: Vessel Specifications and Fishing Practices of two Local Creel Vessels

Vessel	Halcyon II	Helena
Reg. No	BF 500	BF 2
Home Port	Whitehills	Whitehills
Principal fishing method	Creels	Creels
Other fishing methods	Hand lining	N/A
Fishing Association	Moray Firth Inshore	Moray Firth Inshore
Length (m)	7.32	7.90
Beam (m)	2.9	3.2
Draft (m)	0.9	0.6
Main engine (HP)	60	212
Gear box reduction	3:1	2:1
Average days fishing/yr	300	200+
Typical fishing trip duration (days)	1	0.4
Typical distance steamed/trip (n.miles)	10	N/A
Avg steaming speed (knots)	7	N/A
Seasonality of fishing methods (months)	Creels - 10 months, hand lines - 3 months	N/A
Main species targeted	Brown crab, lobster, velvet crab, mackerel	Brown crab, lobster, velvet crab

Vessel	Halcyon II	Helena
Seasonality of fisheries (months)	Creels - 10 month, mackerel - 3 months	N/A
Pot/creel type	Parlour and D-type	Steel and wood

Figure5.33 shows the creel fishing grounds in the Moray Firth, identified by a sample of creel fishermen. The insert shows the fishing grounds identified by local fishermen fishing grounds in the vicinity of the modified export cable route landfall. Two fishermen have been identified as fishing a larger area, with the remaining five fishermen fishing the smaller area. It was noted during consultation, however, that at least one fisherman will be upgrading his vessel and fishing a wider area later in the year (2014).

It should be noted some of the creel vessels identified as operating in the area of the modified export cable route landfall, will also seasonally hand-line for mackerel in the same area.

5.7 Future Fisheries

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

5.7.1 Nephrops Fishery

Nephrops stocks in the Moray Firth are currently considered to be sustainably exploited (Keltz & Bailey, 2010). It is however considered that active vessels may in the future 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.

5.7.2 Scallop Fishery

The Moray Firth scallop fishery is reported to be fished at lower levels than grounds elsewhere, such as the English Channel. The number of vessels in the national scallop fleet has however increased over the last ten years. Although scallop landings values are currently considered to be stable in the Moray Firth, this does not necessarily indicate durable stock levels and may instead indicate an overall decline in population levels (Beukers-Stewart & Beukers-Stewart, 2009).

The scallop fishery could face stricter management in the future with MSS(2010) advising that restrictions are placed on the number of vessels entering the scallop fleet and increases in landing size are recommended for future management of the fishery (Keltz & Bailey, 2010). In addition, it is possible that restrictions may be imposed in the future as a result of conservation management measures, such as the closures enforced in Cardigan Bay and the Isle of Man. Environmental conditions have also affected scallop landings, with the warmer sea temperatures altering the distribution of scallop species (Shephard *et al*., 2010).

5.7.3 Whitefish and Flatfish Fishery

A number of fish species in the Moray Firth have been commercially targeted in the past. These included a flatfish fishery for plaice and sole, a whitefish fishery for species including cod and haddock and a pelagic fishery for herring, mackerel and bass. Recent years have seen a return of the haddock and mackerel fisheries to the area (pers. comm., retired whitefish fisherman, December 2010) and therefore it is possible that other whitefish or flatfish species could once again become commercially targeted species if stocks were to return to sustainable levels. Ability to target the species would however depend upon available quota, which is currently only allocated on the basis of recorded landings and hence would not be available to fishermen with no track record.

5.7.4 Squid Fishery

Restrictions on other fisheries have increased fishing effort on the squid fishery, both for local and visiting vessels. 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 pressure 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 stocks due to increases in fishing pressure and expansion of the fishing season. Increases in sea temperature could lead to the squid population moving north (Hastie *et al*., 2009).

As the Moray Firth is a potential spawning area (squid move to inshore, coastal areas to spawn and squid eggs have been found on creels in the area), it is considered that these grounds need to be identified and effectively managed in order to protect future stocks (Young *et al*., 2006). A number of inshore squid fishermen would also like to see measures implemented in the future to effectively manage the fishery and protect it from overfishing (pers. comm. squid fisherman, December 2010), which could limit activity by larger category, visiting vessels.

5.7.5 Crab and Losbter Fisheries

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 and furthermore, vessels configured to target other species are additionally employing gear to seasonally target crustaceans. 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.

5.7.6 Bivalve Fishery

Within the Moray Firth, there are fisheries for razor clams on the Navity Bank (The Moray Firth Partnership, 2007), mussels in the Dornoch Firth (The Moray Firth Partnership, 2003) and cockles in Inver Bay in the Dornoch Firth and in Culbin Sands in the Inner Moray Firth (The Moray Firth Partnership, 2006). All of the bivalve fisheries are currently targeted at low levels, in inshore areas away from the modified export cable route corridor although there is considered to be scope for expansion in the future (see the Technical Appendix 5.1A (Commercial Fisheries Technical Report) of the MORL ES (MORL, 2012) for further information).

5.7.7 Sandeel Fishery

There is currently no fishing for sandeels in the Moray Firth, although there has historically been a fishery, concentrated on the Smith Bank and targeted predominantly by the Danish fleet. The North Sea sandeel fishery was closed in 2000 as a result of concerns about marine top predators, particularly seabirds. The fishery was reopened in 2009 with a quota of 200,000 tonnes (MMO statistics), although there still remains a moratorium on the fishery along the Scottish east coast and grounds such as the Dogger Bank are targeted.

It has been reported that recent years have seen an increase in sandeel populations in harbours and bays of the Moray Firth and subsequently an increase in the number of species that prey on sandeels (in particular herring and mackerel; pers. comm. retired whitefish fisherman, December 2010). Furthermore, sandeel populations on the Smith Bank are reported to support a number of top predators, including birds, marine mammals and other fish species. It is possible that a fishery may recommence in the future, although it should be noted that the Danish fleet (to whom the vast majority of quota is allocated) only have access to grounds outside of 12 nm and possible activity in the area of the modified OfTI will be limited.

6 References

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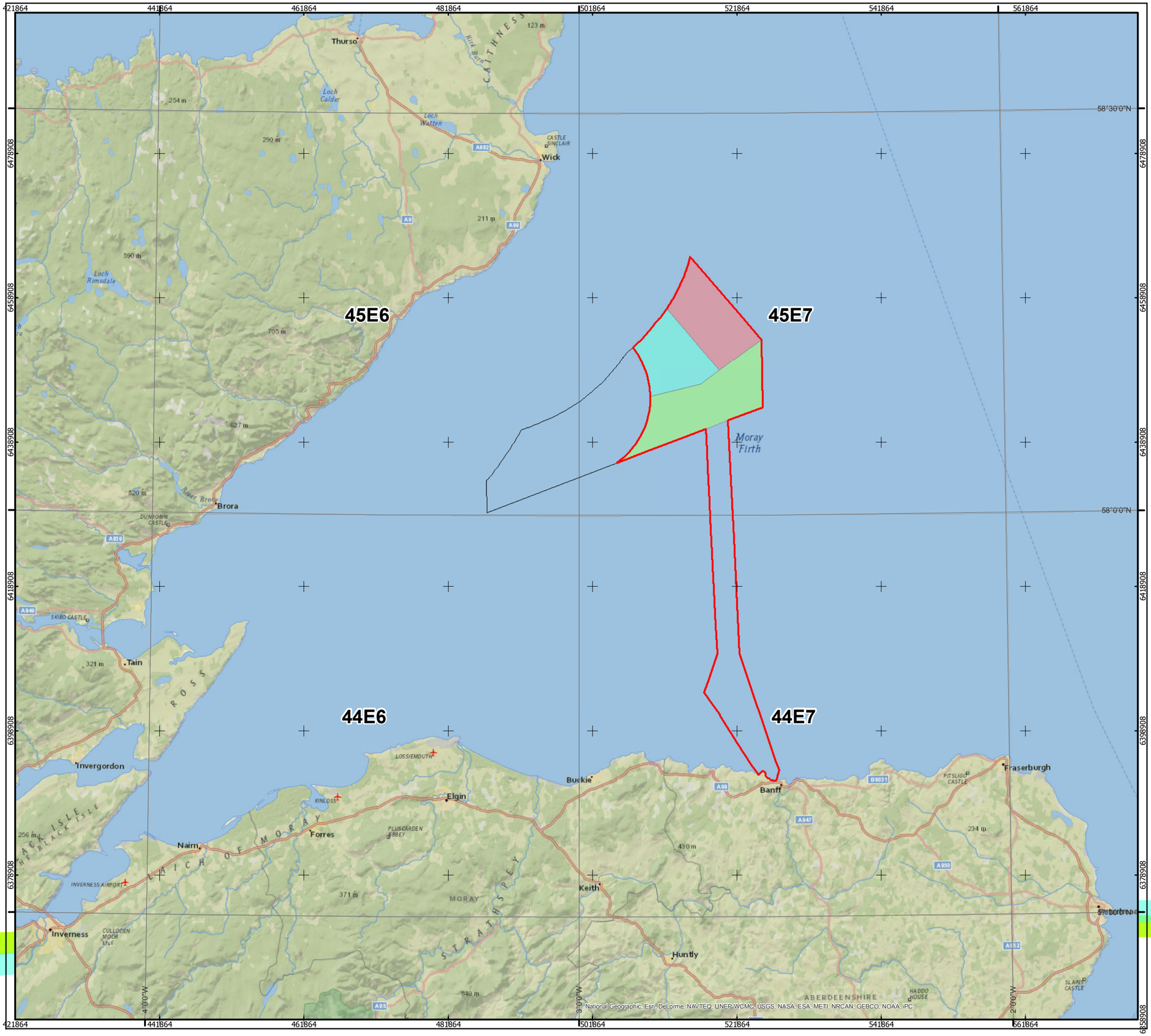


edp renewables

REPSOL

Moray Offshore Renewables Ltd

KEY

- Modified Offshore Transmission Infrastructure
- MacColl
- Stevenson
- Telford
- Western Development Area
- ICES Rectangles

Horizontal Scale: 1:500,000 A3 Chart

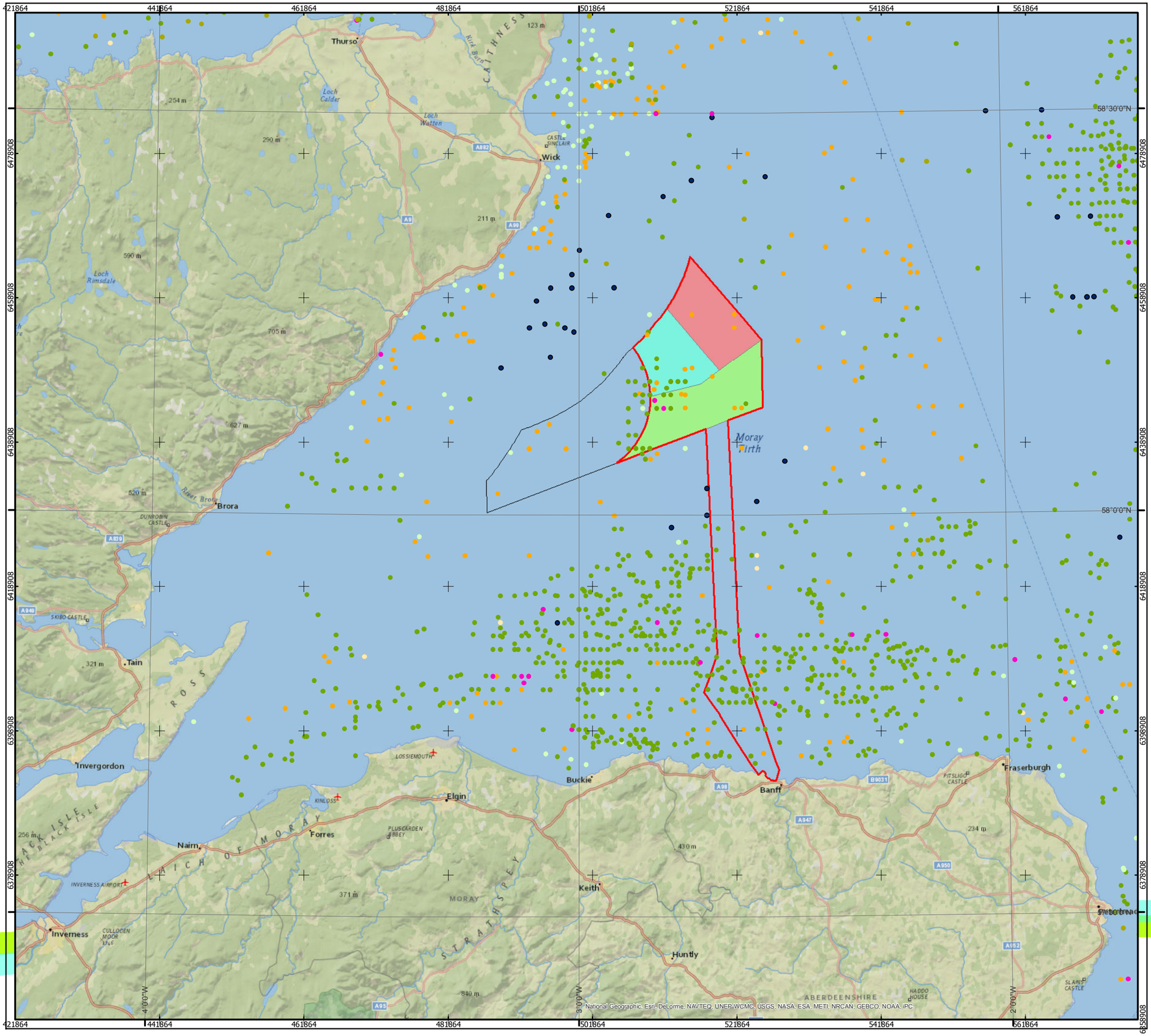
0 12,000 24,000 Meters

N

Geodetic Parameters:	WGS84 UTM Zone 30N
Produced: RP Reviewed: ES Approved: PM	
Date: 18/06/2014	Revision: C
REF: 8460001-PSO0162-BMM-MAP-001	

Figure 2.1
Study Area

Moray Offshore Renewables Ltd



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REPSOL

Moray Offshore Renewables Ltd

KEY

- Modified Offshore Transmission Infrastructure
- MacColl
- Stevenson
- Telford
- Western Development Area

Method

- Demersal Trawler
- Scallop Dredger
- Creeler
- Trawler (Unspecified)
- Seine Netter
- Pelagic Trawler
- Other Method

Horizontal Scale: 1:500,000 A3 Chart

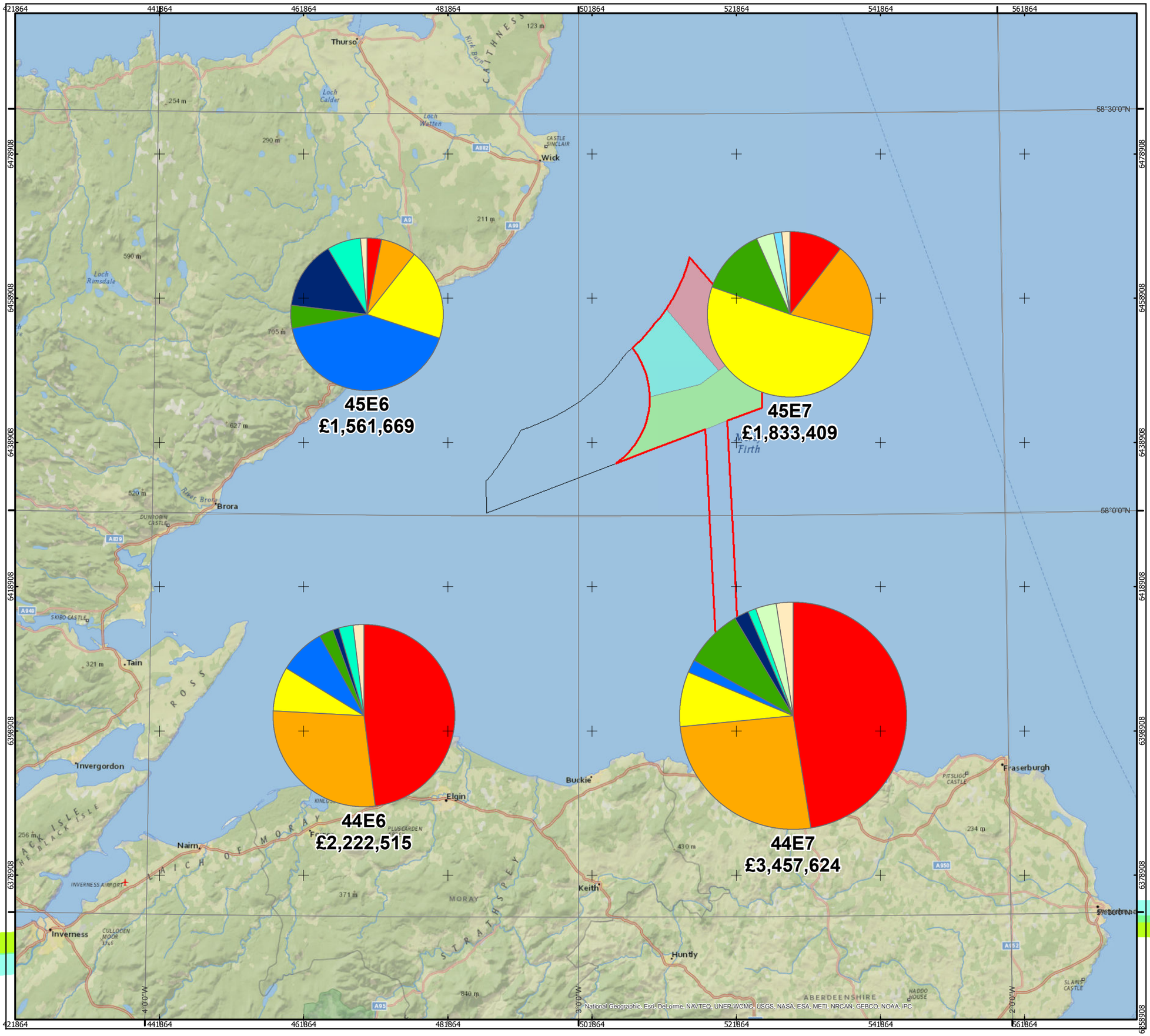
0 12,000 24,000 Meters

N

Geodetic Parameters:	WGS84 UTM Zone 30N
Produced: RP Reviewed: ES Approved: PM	
Date: 18/06/2014	Revision: C
REF: 8460001-PSO0162-BMM-MAP-002	

Figure 5.2
Surveillance Sightings by Method, UK Only 2008 - 2012

Moray Offshore Renewables Ltd



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REPSOL

Moray Offshore Renewables Ltd

KEY

- Modified Offshore Transmission Infrastructure
- MacColl
- Stevenson
- Telford
- Western Development Area
- ICES Rectangles

Species

- Nephrops
- Squid
- Scallops
- Lobsters
- Haddock
- Edible Crabs
- Velvet Crabs
- Monks or Anglers
- Cod
- Mackerel
- Other Species

Horizontal Scale: 1:500,000 A3 Chart

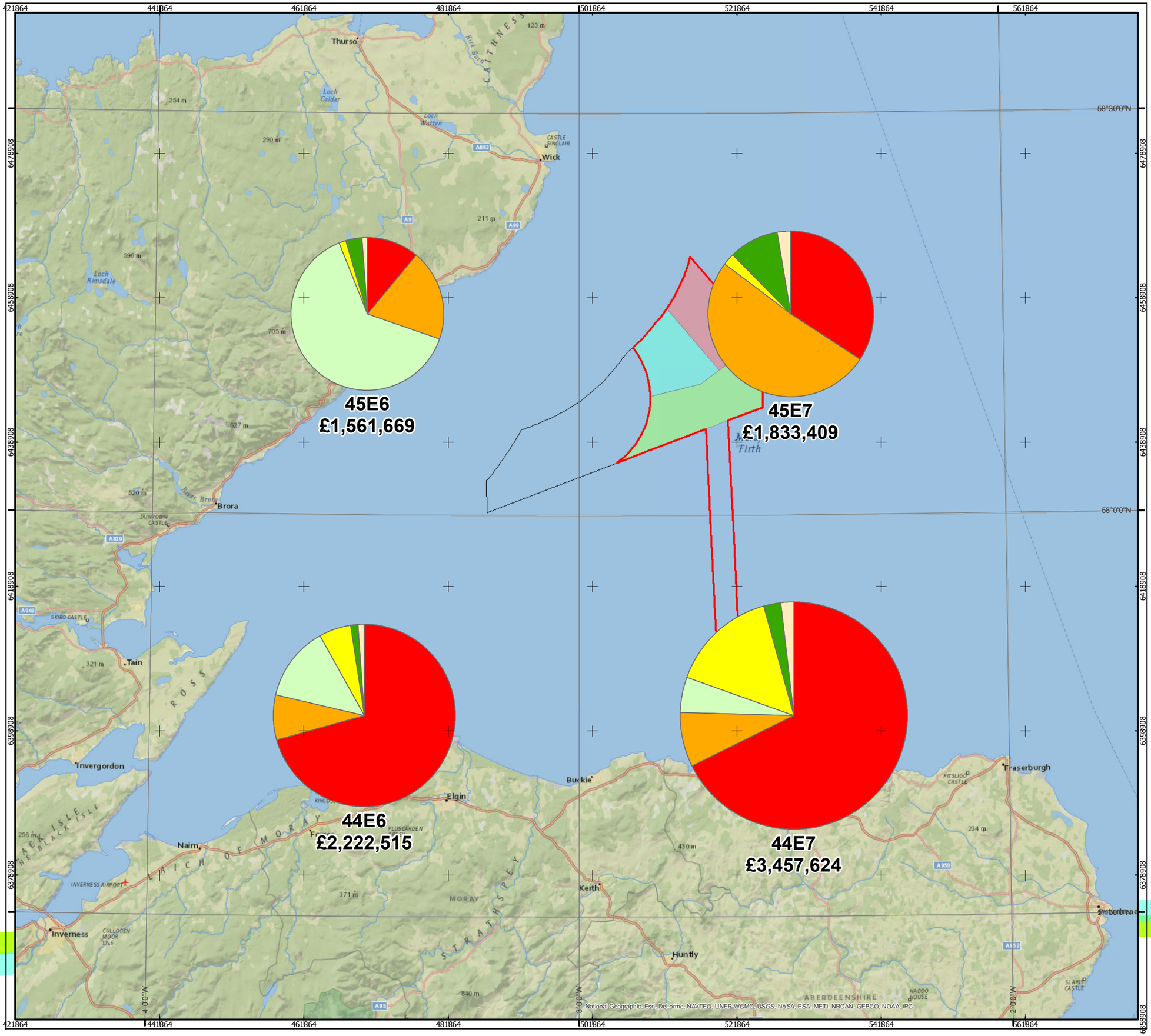
0 12,000 24,000 Meters

N

Geodetic Parameters:	WGS84 UTM Zone 30N
Produced: RP Reviewed: ES Approved: PM	
Date: 18/06/2014	Revision: C
REF: 8460001-PSO0162-BMM-MAP-003	

Figure 5.3
Value by Species, UK Only
(Average 2008 - 2012)

Moray Offshore Renewables Ltd



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REPSOL

Moray Offshore Renewables Ltd

KEY

- Modified Offshore Transmission Infrastructure
- MacColl
- Stevenson
- Telford
- Western Development Area
- ICES Rectangles

Method

- Bottom otter trawls
- Boat dredges
- Pots
- Otter twin trawls
- Scottish seines
- Other Method

Horizontal Scale: 1:500,000 A3 Chart

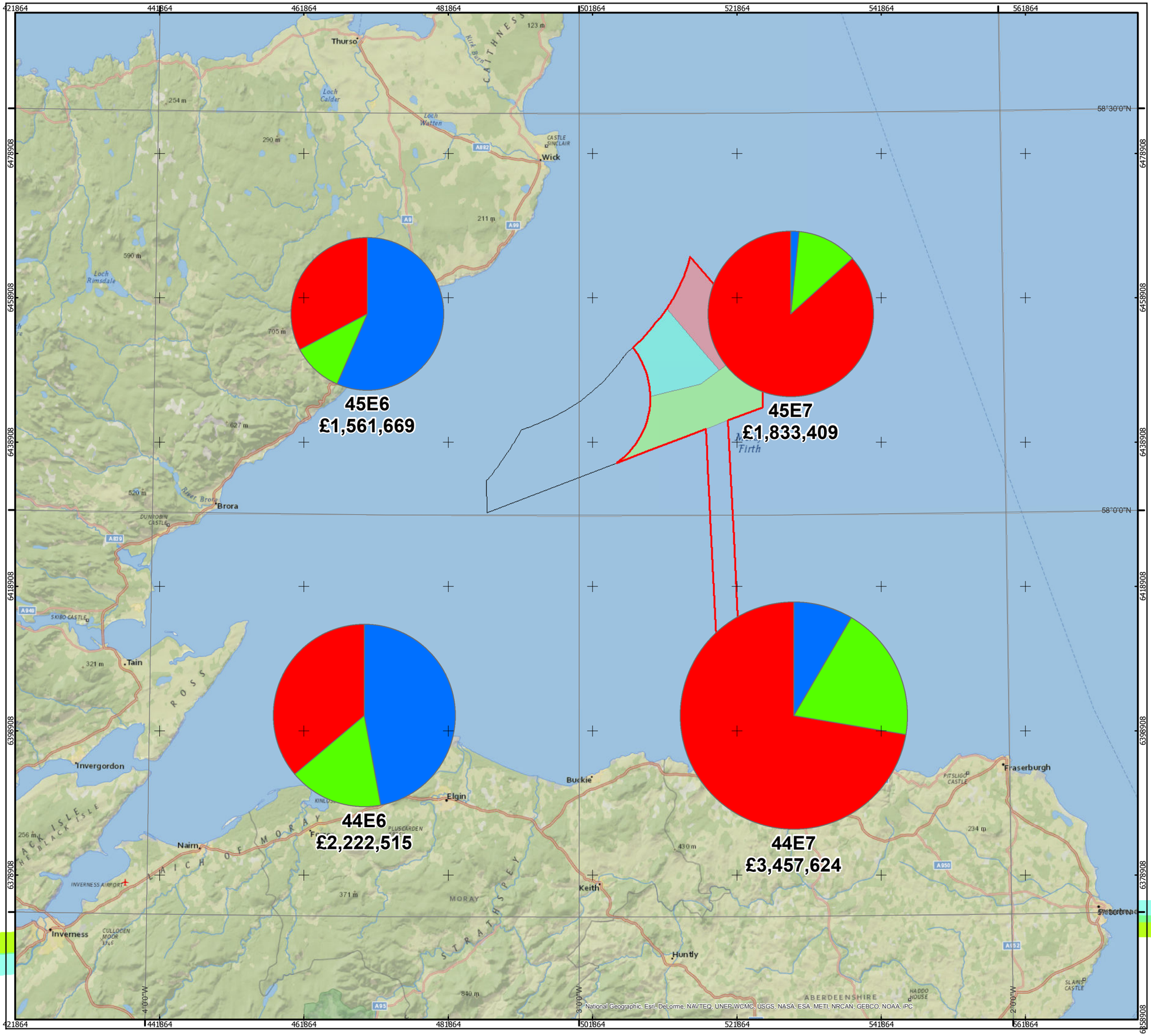
0 12,000 24,000 Meters

N

Geodetic Parameters:	WGS84 UTM Zone 30N
Produced: RP Reviewed: ES Approved: PM	
Date: 18/06/2014	Revision: C
REF: 8460001-PSO0162-BMM-MAP-004	

Figure 5.4
Value by Method, UK Only
(Average 2008 - 2012)

Moray Offshore Renewables Ltd



Moray Offshore Renewables Ltd

KEY

- Modified Offshore Transmission Infrastructure
- MacColl
- Stevenson
- Telford
- Western Development Area
- ICES Rectangles

Vessel Size

- Under-10m
- 10m to 15m
- Over-15m

Horizontal Scale: 1:500,000 A3 Chart

0 12,000 24,000 Meters

N

Geodetic Parameters: WGS84 UTM Zone 30N

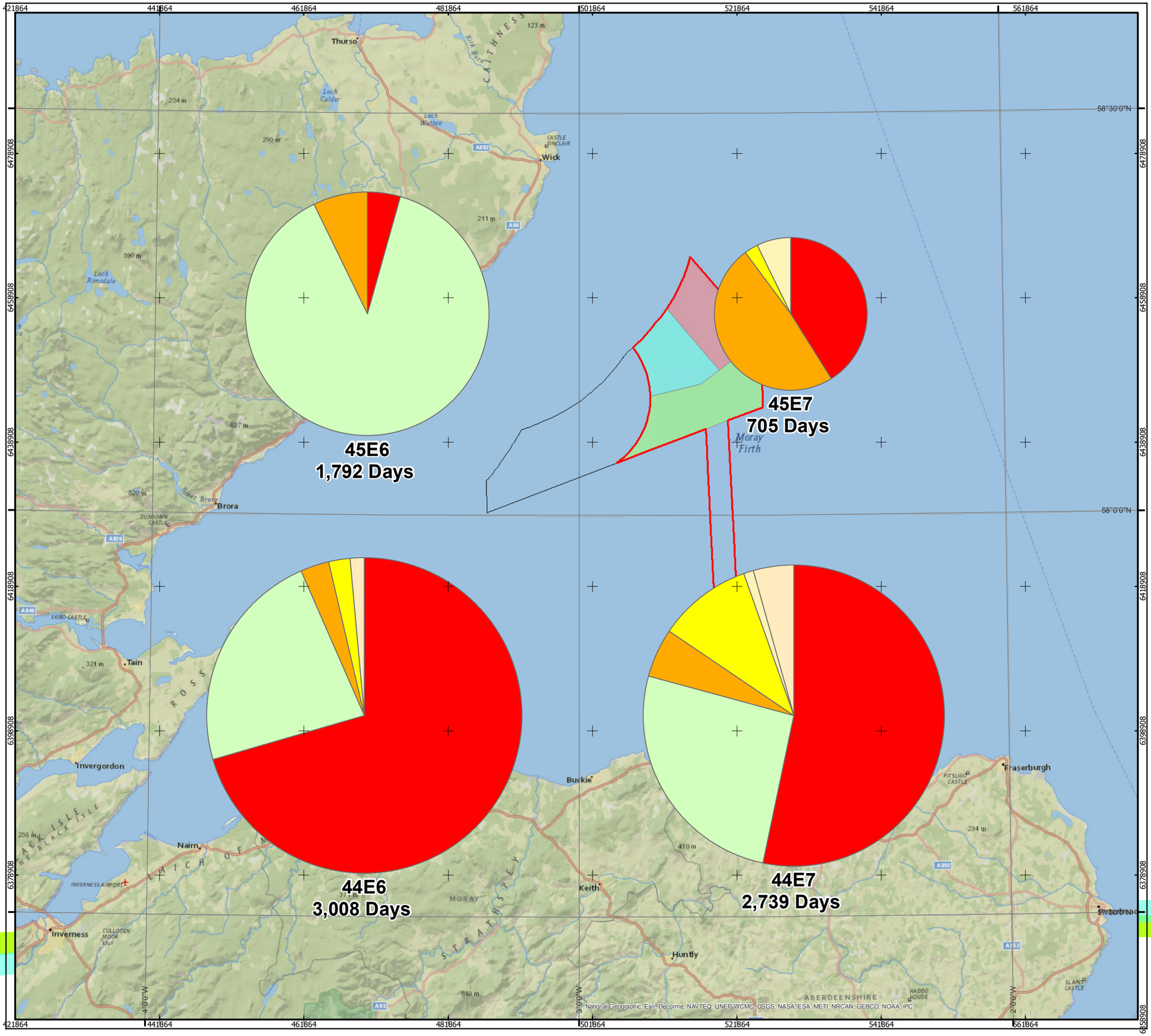
Produced: RP
Reviewed: ES
Approved: PM

Date: 18/06/2014 | Revision: C

REF: 8460001-PSO0162-BMM-MAP-005

Figure 5.5
Value by Vessel Size, UK Only
(Average 2008 - 2012)

Moray Offshore Renewables Ltd



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REPSOL

Moray Offshore Renewables Ltd

KEY

- Modified Offshore Transmission Infrastructure
- MacColl
- Stevenson
- Telford
- Western Development Area
- ICES Rectangles

Method

- Bottom otter trawls
- Boat dredges
- Pots
- Otter twin trawls
- Scottish seines
- Other Method

Horizontal Scale: 1:500,000 A3 Chart

0 12,000 24,000 Meters

N

Geodetic Parameters: WGS84 UTM Zone 30N

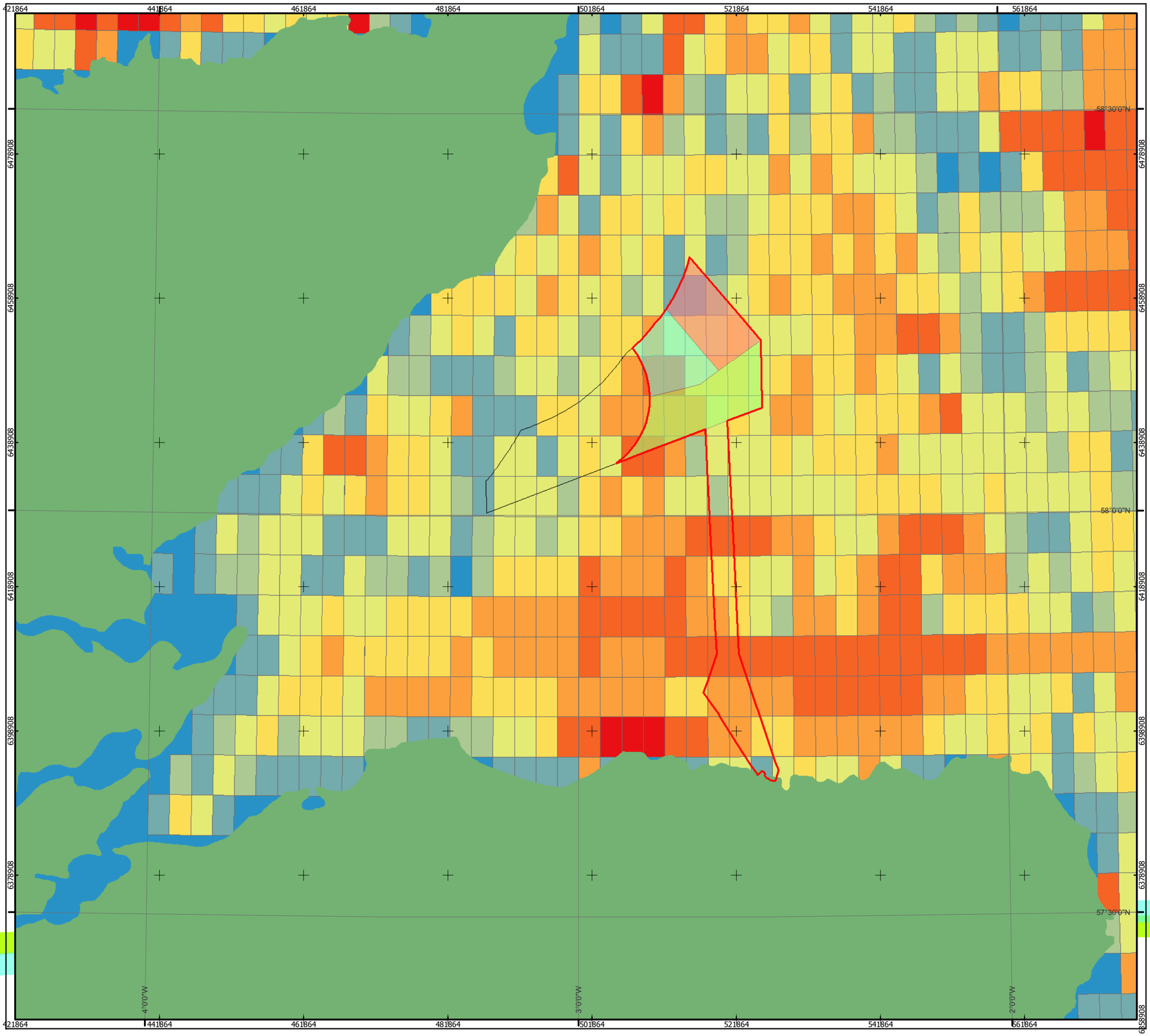
Produced: RP
Reviewed: ES
Approved: PM

Date: 18/06/2014 | Revision: C

REF: 8460001-PSO0162-BMM-MAP-006

Figure 5.6
Effort by Method, UK Only
(Average 2008 - 2012)

Moray Offshore Renewables Ltd



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REPSOL

Moray Offshore Renewables Ltd

KEY

- Modified Offshore Transmission Infrastructure
- MacColl
- Stevenson
- Telford
- Western Development Area

Average Value 2008 - 2012

- No Value
- Less than £1,000
- £1,000 to £2,000
- £2,000 to £5,000
- £5,000 to £10,000
- £10,000 to £20,000
- £20,000 to £50,000
- Over £50,000

Horizontal Scale: 1:500,000 A3 Chart

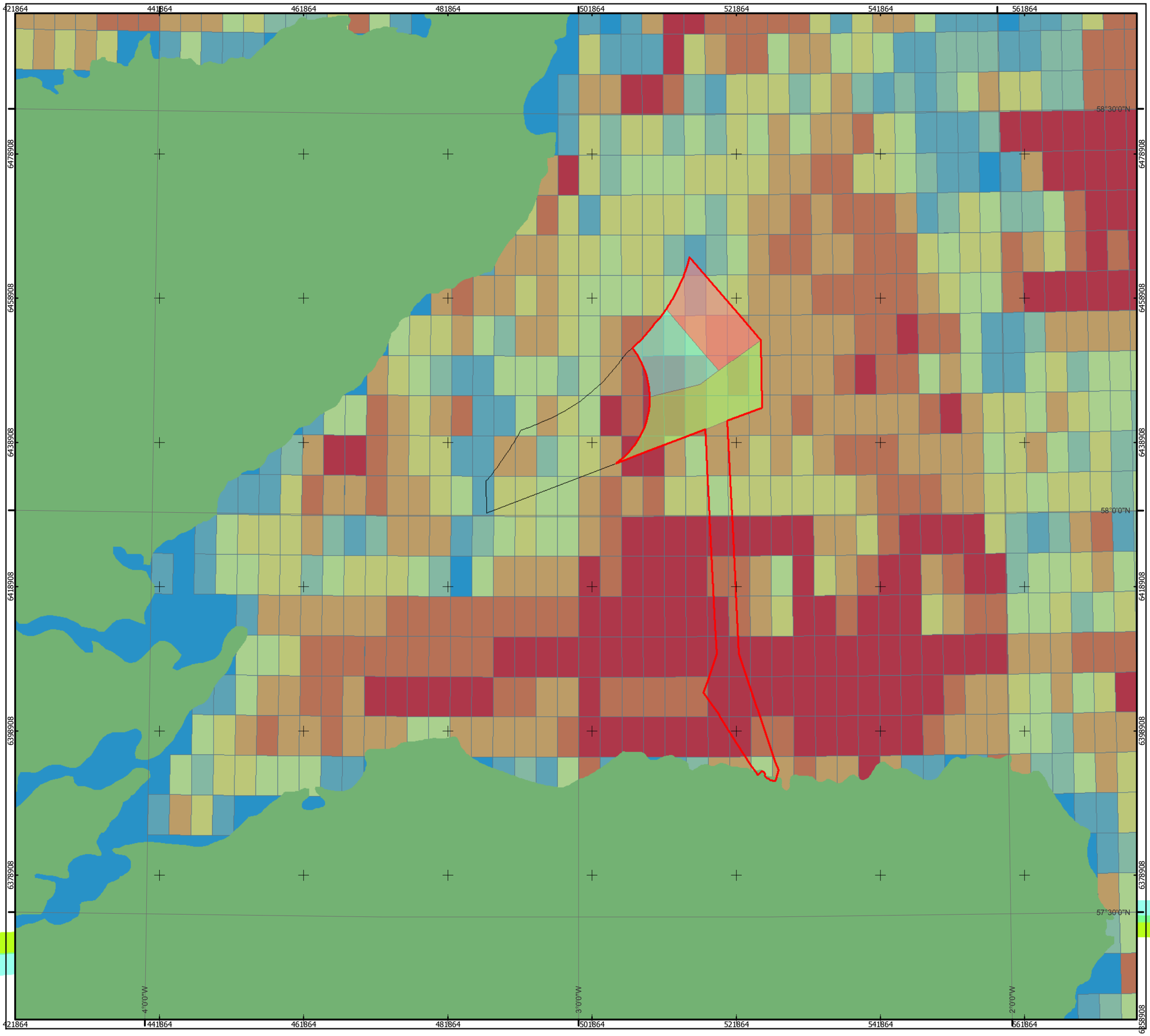
0 12,000 24,000 Meters

N

Geodetic Parameters:	WGS84 UTM Zone 30N
Produced: RP Reviewed: ES Approved: PM	
Date: 18/06/2014	Revision: C
REF: 8460001-PSO0162-BMM-MAP-007	

Figure 5.11
VMS Density by Value
(Average 2008 - 2012)

Moray Offshore Renewables Ltd



Moray Offshore Renewables Ltd

KEY

- Modified Offshore Transmission Infrastructure
- MacColl
- Stevenson
- Telford
- Western Development Area

Average Effort 2008 - 2012

- No Value
- Less than 100 hours
- 100 to 250 hours
- 250 to 500 hours
- 500 to 1,000 hours
- 1,000 to 2,500 hours
- 2,500 to 5,000 hours
- More than 5,000 hours

Horizontal Scale: 1:500,000 A3 Chart

0 12,000 24,000 Meters

N

Geodetic Parameters: WGS84 UTM Zone 30N

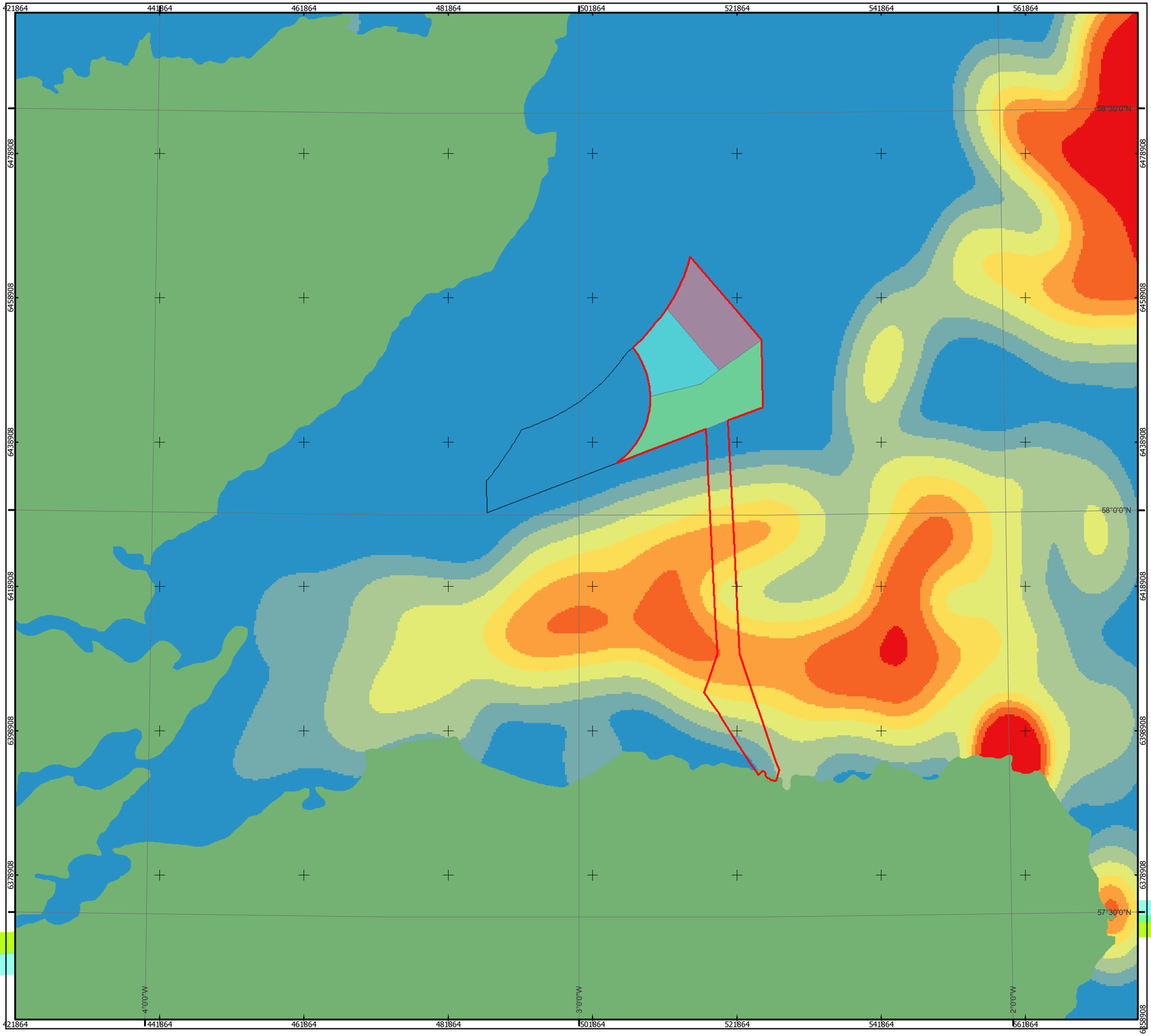
Produced: RP
Reviewed: ES
Approved: PM

Date: 18/06/2014 | Revision: C

REF: 8460001-PSO0162-BMM-MAP-008

Figure 5.12
VMS Density by Effort
(Average 2008 - 2012)

Moray Offshore Renewables Ltd



Moray Offshore Renewables Ltd

KEY

- Modified Offshore Transmission Infrastructure
- MacColl
- Stevenson
- Telford
- Western Development Area

Nephrops Relative Value

- Low
- High

Horizontal Scale: 1:500,000 A3 Chart

0 12,000 24,000 Meters

N

Geodetic Parameters: WGS84 UTM Zone 30N

Produced: RP
Reviewed: ES
Approved: PM

Date: 18/06/2014 | Revision: C

REF: 8460001-PSO0162-BMM-MAP-009

Figure 5.13 Commercial Fisheries Distribution by Value, Nephrops, 2007 to 2011, Kafas et al. 2012

Moray Offshore Renewables Ltd

421864 441864 461864 481864 501864 521864 541864 561864

58°30'0"N

58°0'0"N

57°30'0"N

6478908 6458908 6438908 6418908 6398908 6378908 6358908

4°0'0"W 3°0'0"W 2°0'0"W

Moray Offshore Renewables Ltd

REPSOL

KEY

- Modified Offshore Transmission Infrastructure
- MacColl
- Stevenson
- Telford
- Western Development Area

Scallop Relative Value

- Low
- High

Horizontal Scale: 1:500,000 A3 Chart

0 12,000 24,000 Meters

N

Geodetic Parameters: WGS84 UTM Zone 30N

Produced: RP
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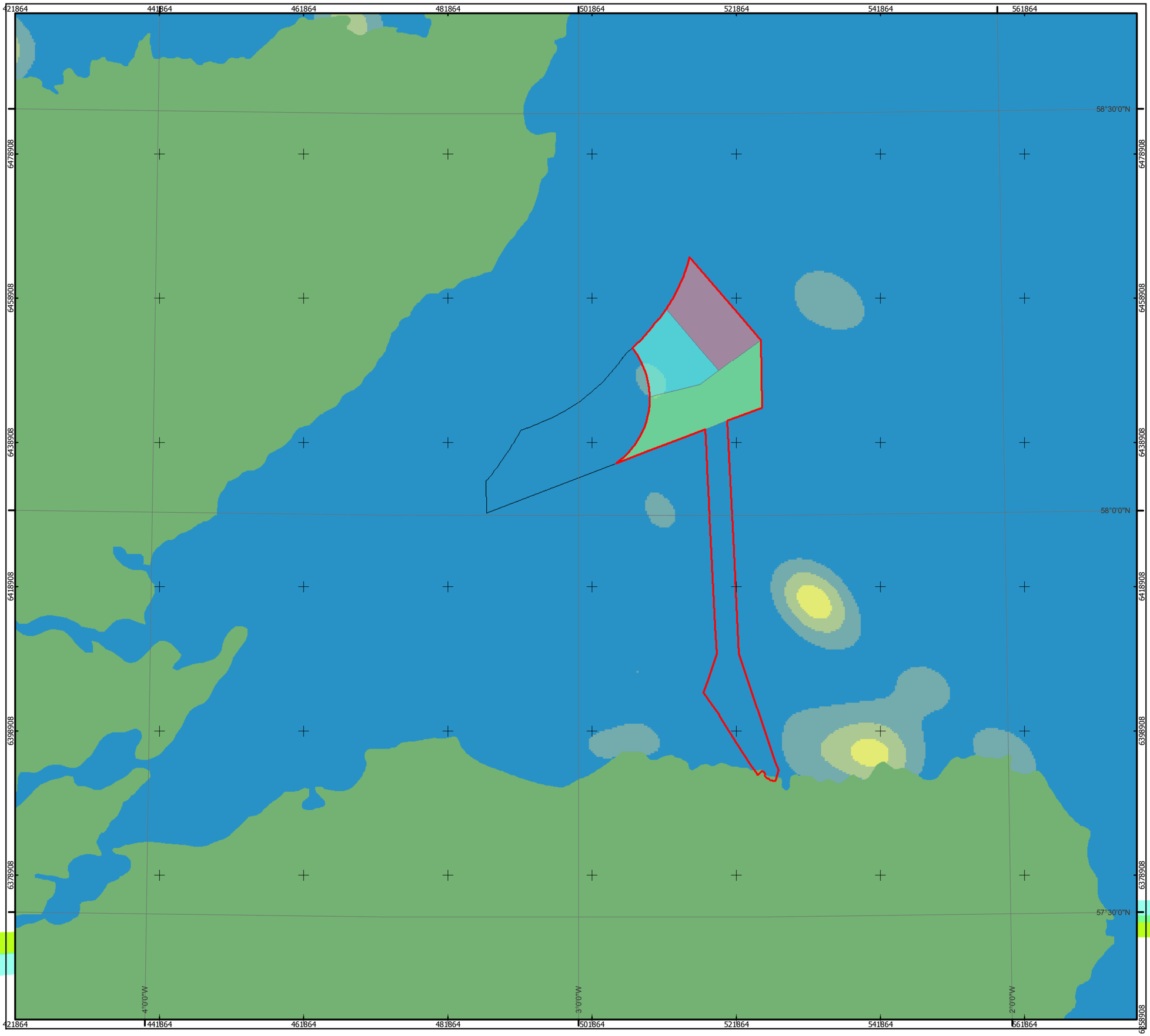
Approved: PM

Date: 18/06/2014 | Revision: C

REF: 8460001-PSO0162-BMM-MAP-010

Figure 5.14 Commercial Fisheries Distribution by Value, Scallop, 2007 to 2011, Kafas et al. 2012

Moray Offshore Renewables Ltd



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REPSOL

Moray Offshore Renewables Ltd

KEY

- Modified Offshore Transmission Infrastructure
- MacColl
- Stevenson
- Telford
- Western Development Area

Squid Relative Value

- Low
- High

Horizontal Scale: 1:500,000 A3 Chart

0 12,000 24,000 Meters

N

Geodetic Parameters: WGS84 UTM Zone 30N

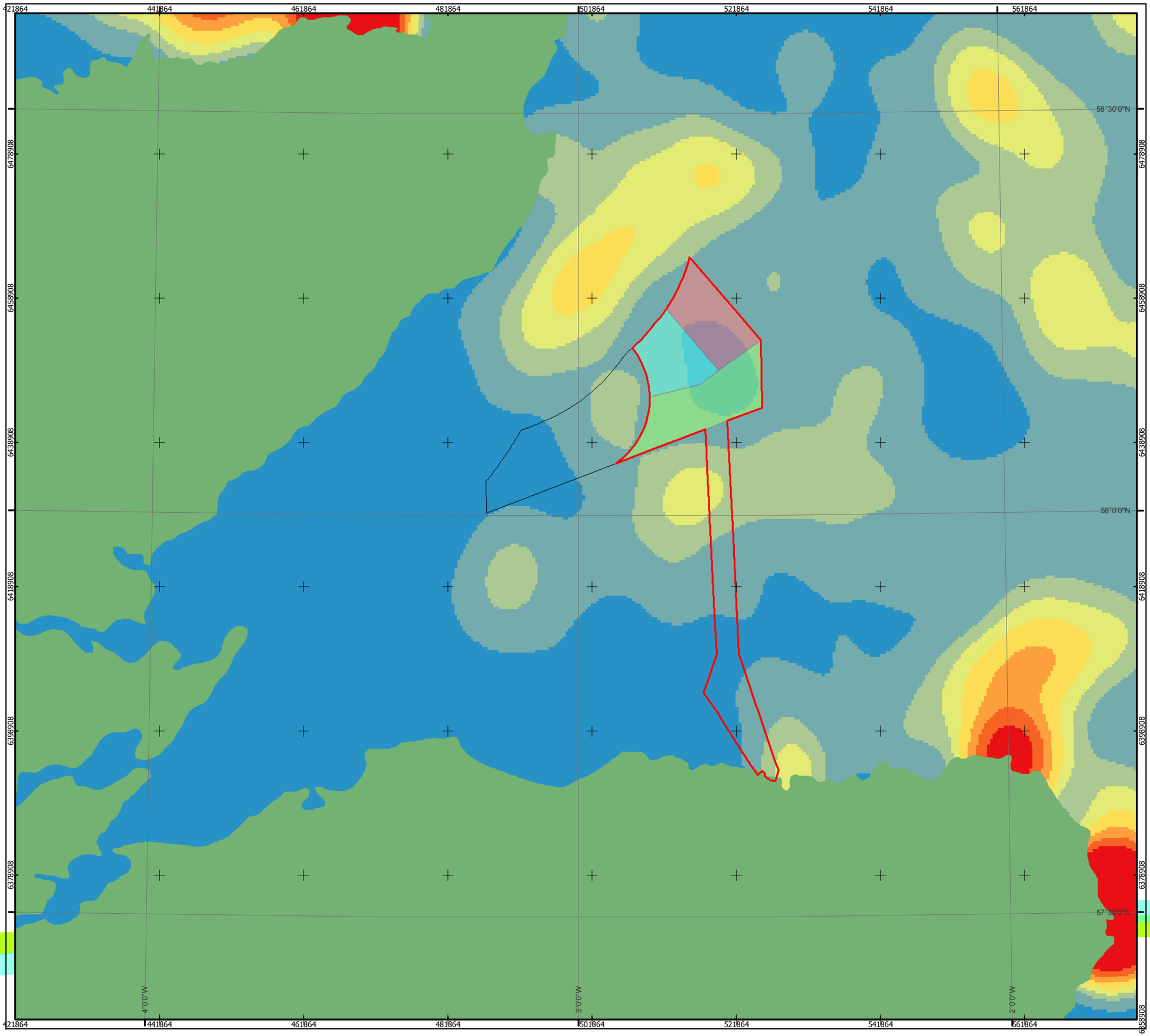
Produced: RP
Reviewed: ES
Approved: PM

Date: 18/06/2014 | Revision: C

REF: 8460001-PSO0162-BMM-MAP-011

Figure 5.15 Commercial Fisheries Distribution by Value, Squid, 2007 to 2011, Kafas et al. 2012

Moray Offshore Renewables Ltd



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REPSOL

Moray Offshore Renewables Ltd

KEY

- Modified Offshore Transmission Infrastructure
- MacColl
- Stevenson
- Telford
- Western Development Area

Demersal Relative Value

- Low
- High

Horizontal Scale: 1:500,000 A3 Chart

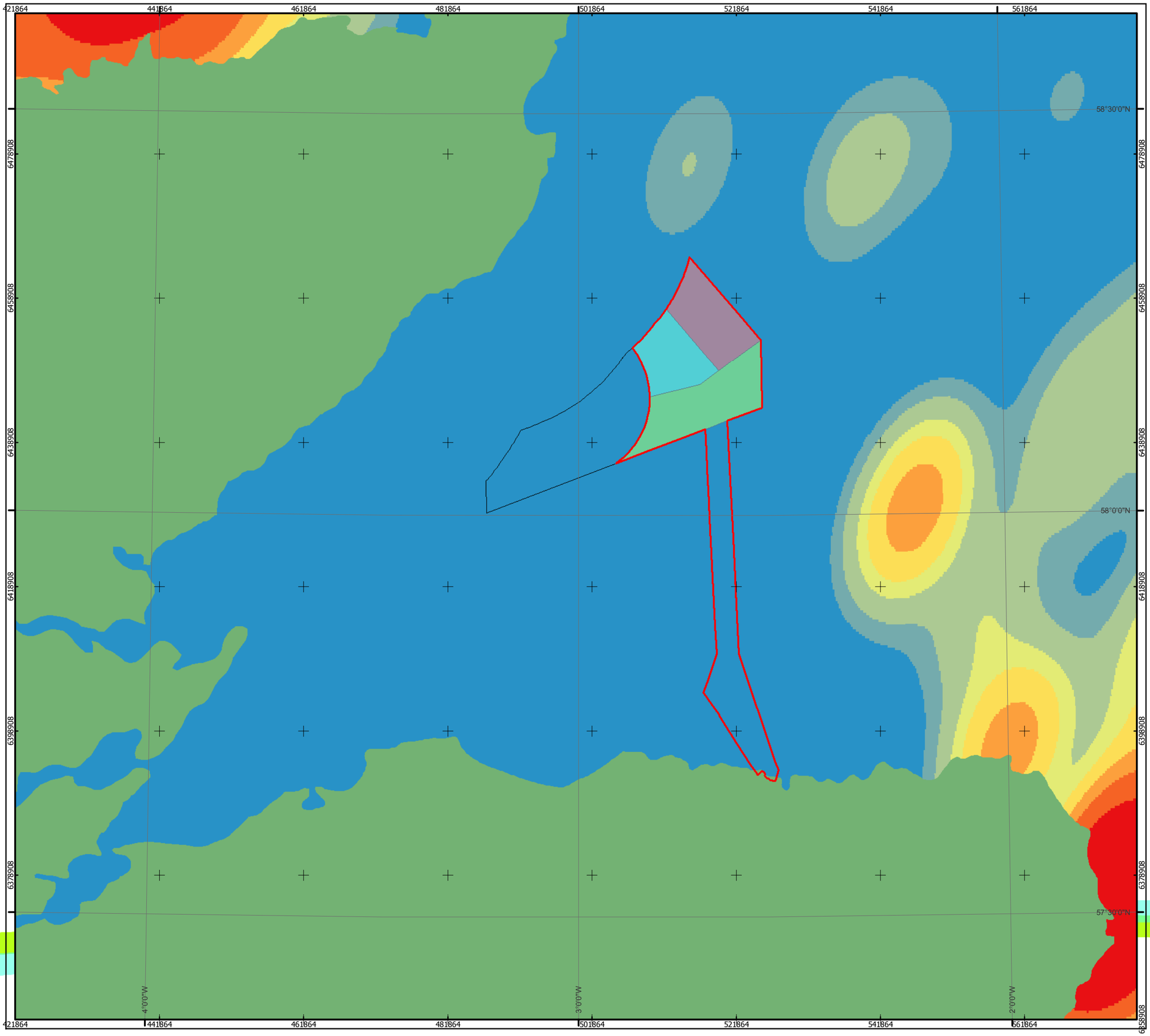
0 12,000 24,000 Meters

N

Geodetic Parameters:	WGS84 UTM Zone 30N
Produced: RP Reviewed: ES Approved: PM	
Date: 18/06/2014	Revision: C
REF: 8460001-PSO0162-BMM-MAP-012	

Figure 5.16 Commercial Fisheries Distribution by Value, Demersal, 2007 to 2011, Kafas et al. 2012

Moray Offshore Renewables Ltd



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REPSOL

Moray Offshore Renewables Ltd

KEY

- Modified Offshore Transmission Infrastructure
- MacColl
- Stevenson
- Telford
- Western Development Area

Herring Relative Value

- Low
- High

Horizontal Scale: 1:500,000 A3 Chart

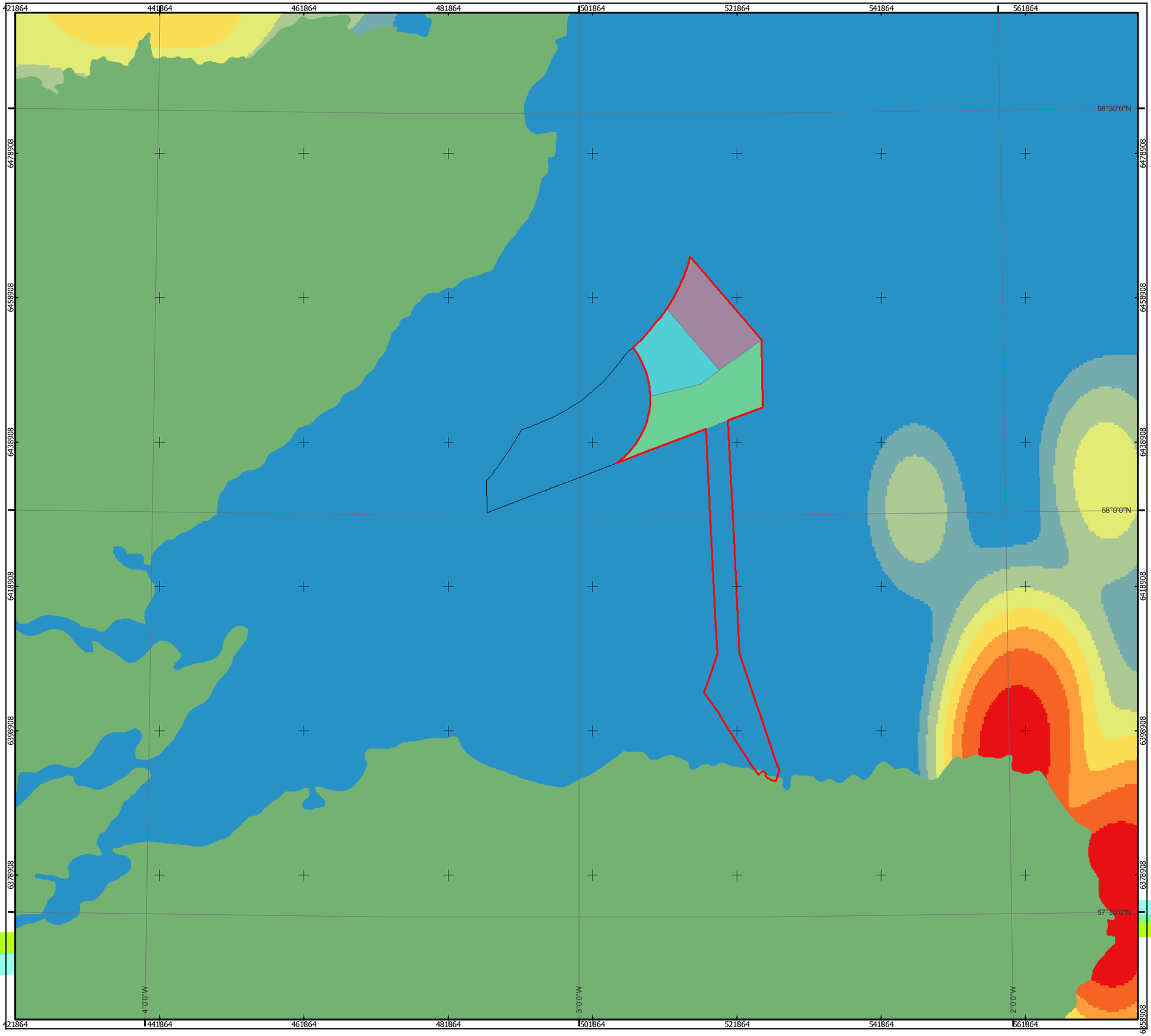
0 12,000 24,000 Meters

N

Geodetic Parameters:	WGS84 UTM Zone 30N
Produced: RP Reviewed: ES Approved: PM	
Date: 18/06/2014	Revision: C
REF: 8460001-PSO0162-BMM-MAP-013	

Figure 5.17 Commercial Fisheries Distribution by Value, Herring, 2007 to 2011, Kafas et al. 2012

Moray Offshore Renewables Ltd



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REPSOL

Moray Offshore Renewables Ltd

KEY

- Modified Offshore Transmission Infrastructure
- MacColl
- Stevenson
- Telford
- Western Development Area

Pelagic Relative Value

- Low
- High

Horizontal Scale: 1:500,000 A3 Chart

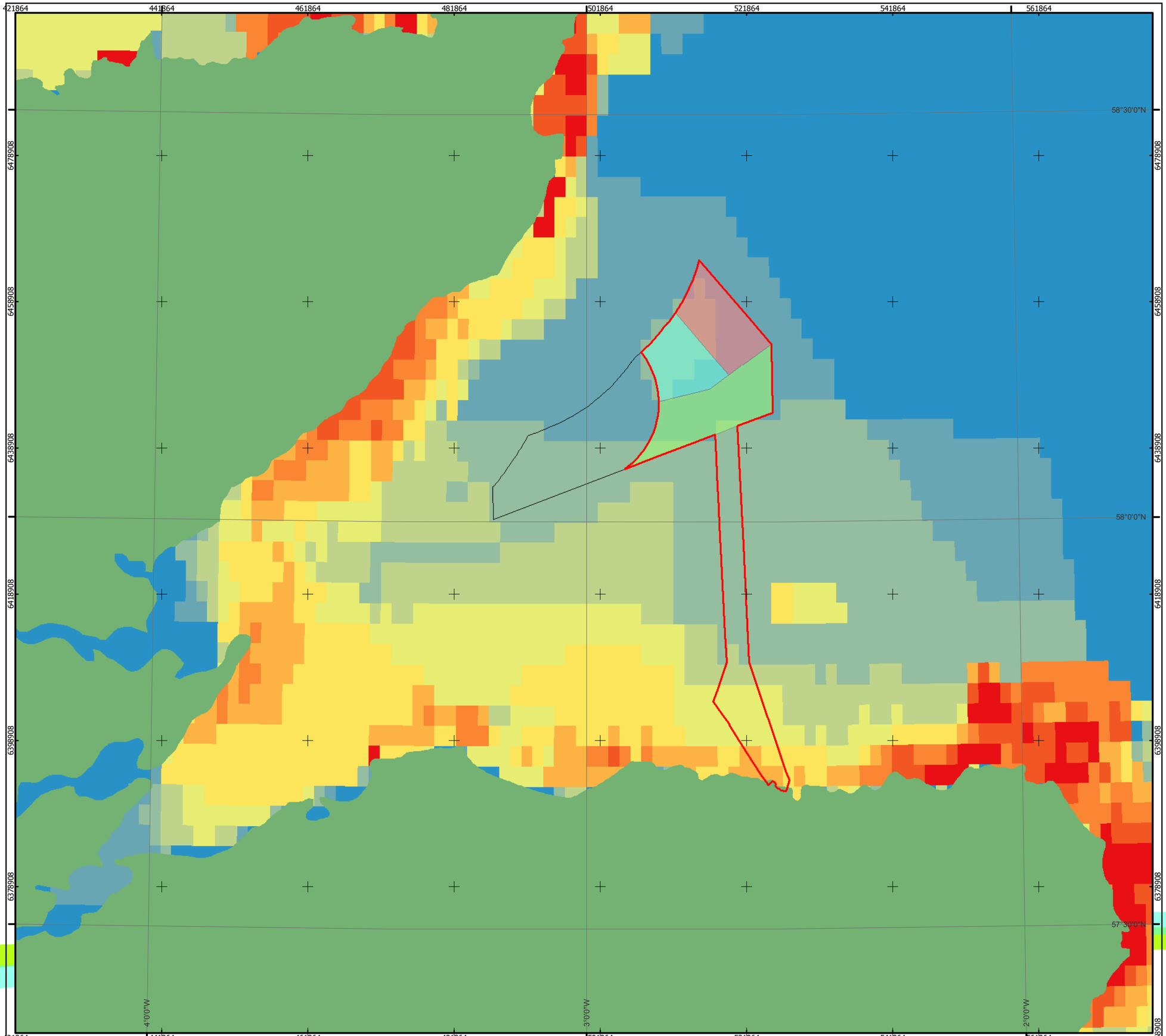
0 12,000 24,000 Meters

N

Geodetic Parameters:	WGS84 UTM Zone 30N
Produced: RP Reviewed: ES Approved: PM	
Date: 18/06/2014	Revision: C
REF: 8460001-PSO0162-BMM-MAP-014	

Figure 5.18 Commercial Fisheries Distribution by Value, Pelagic, 2007 to 2011, Kafas et al. 2012

Moray Offshore Renewables Ltd



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REPSOL

Moray Offshore Renewables Ltd

KEY

- Modified Offshore Transmission Infrastructure
- MacColl
- Stevenson
- Telford
- Western Development Area

Monetary Value (£)

- 221
- 222 - 442
- 443 - 884
- 885 - 1,326
- 1,327 - 1,989
- 1,990 - 2,873
- 2,874 - 3,978
- 3,979 - 5,747
- 5,748 - 9,062
- 9,063 - 56,361

Horizontal Scale: 1:500,000 A3 Chart

N

0 12,000 24,000 Meters

Geodetic Parameters: WGS84 UTM Zone 30N

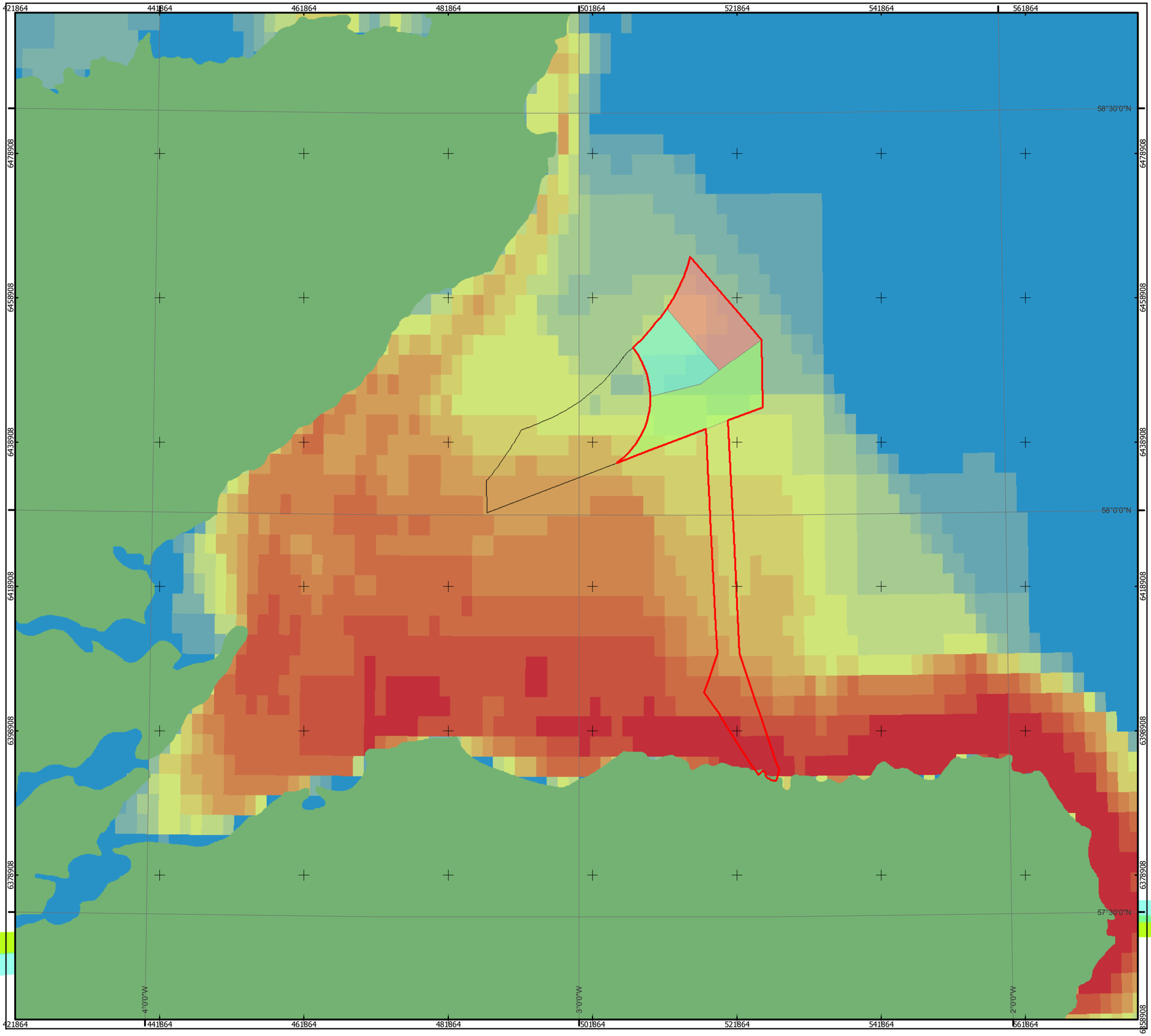
Produced: RP
Reviewed: ES
Approved: PM

Date: 18/06/2014 | Revision: C

REF: 8460001-PSO0162-BMM-MAP-015

Figure 5.19
ScotMap - Monetary Value
(2007 - 2011)

Moray Offshore
Renewables Ltd



renewables

REPSOL

Moray Offshore Renewables Ltd

KEY

- Modified Offshore Transmission Infrastructure
- MacColl
- Stevenson
- Telford
- Western Development Area

Number of Vessels

- 3
- 4
- 5
- 6 - 7
- 8
- 9
- 10 - 11
- 12 - 13
- 14 - 15
- 16 - 17
- 18 - 20
- 21 - 23
- 24 - 28
- 29 - 34
- 35 - 94

Horizontal Scale: 1:500,000 A3 Chart

N

0 12,000 24,000 Meters

Geodetic Parameters: WGS84 UTM Zone 30N

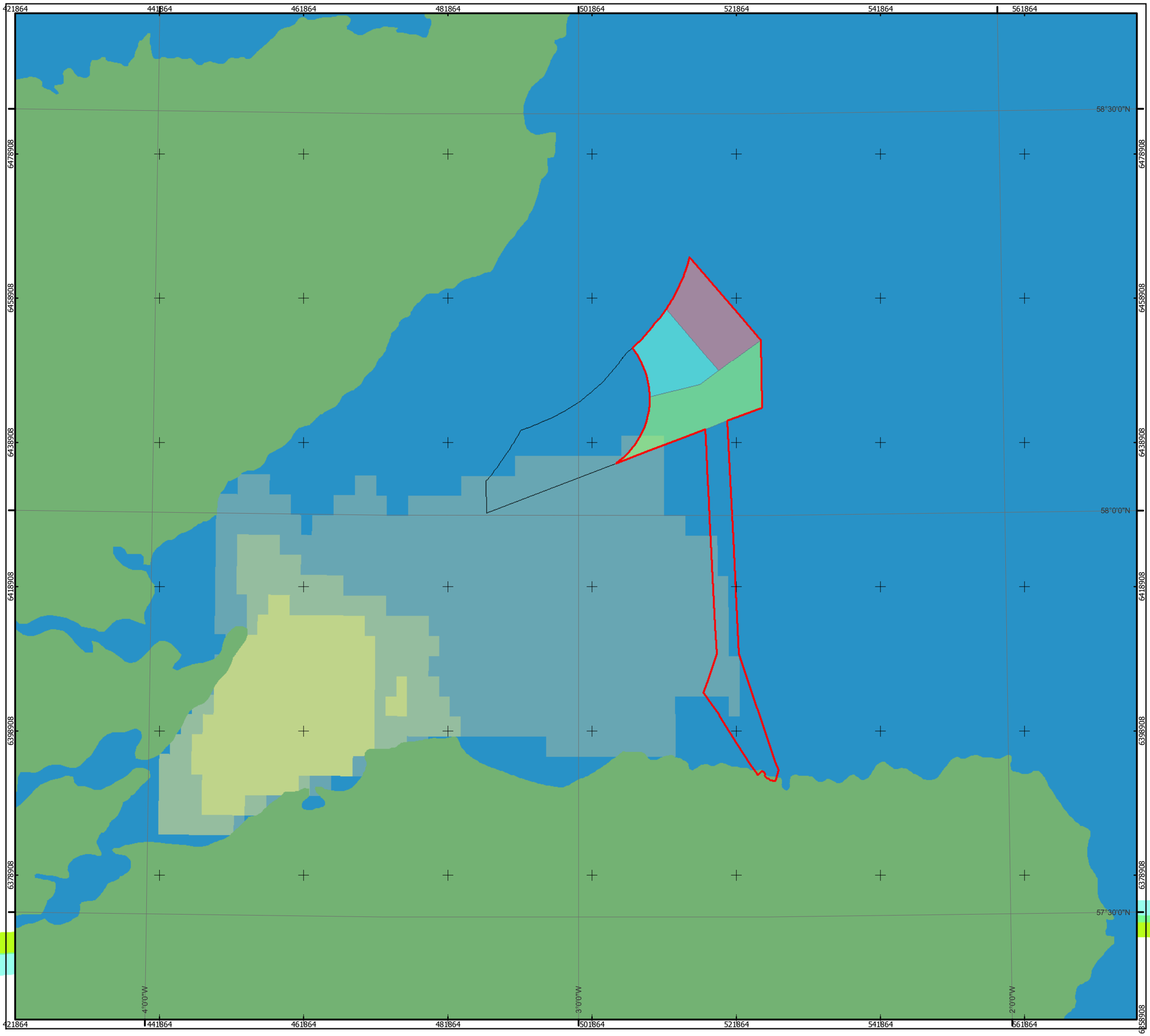
Produced: RP
Reviewed: ES
Approved: PM

Date: 18/06/2014 | Revision: C

REF: 8460001-PSO0162-BMM-MAP-016

Figure 5.20
ScotMap - Number of Vessels
(2007 - 2011)

Moray Offshore Renewables Ltd



Moray Offshore Renewables Ltd

KEY

- Modified Offshore Transmission Infrastructure
- MacColl
- Stevenson
- Telford
- Western Development Area

Monetary Value (£)

- Low
- High

Horizontal Scale: 1:500,000 A3 Chart

0 12,000 24,000 Meters

N

Geodetic Parameters: WGS84 UTM Zone 30N

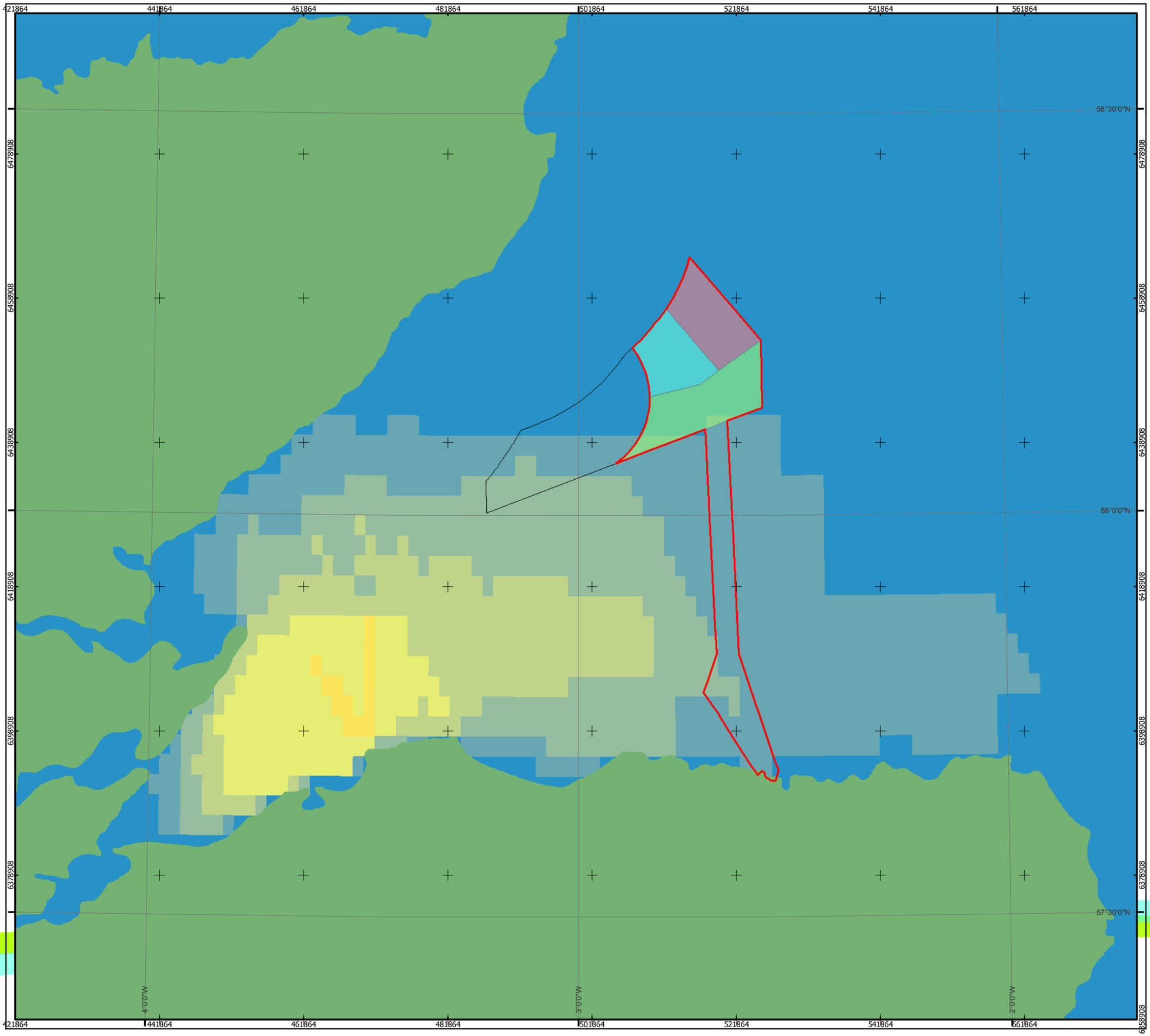
Produced: RP
Reviewed: ES
Approved: PM

Date: 18/06/2014 | Revision: C

REF: 8460001-PSO0162-BMM-MAP-017

Figure 5.21
ScotMap - Nephrops, Monetary Value

Moray Offshore Renewables Ltd



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REPSOL

Moray Offshore Renewables Ltd

KEY

- Modified Offshore Transmission Infrastructure
- MacColl
- Stevenson
- Telford
- Western Development Area

Number of Vessels

- Low
- High

Horizontal Scale: 1:500,000 A3 Chart

0 12,000 24,000 Meters

N

Geodetic Parameters: WGS84 UTM Zone 30N

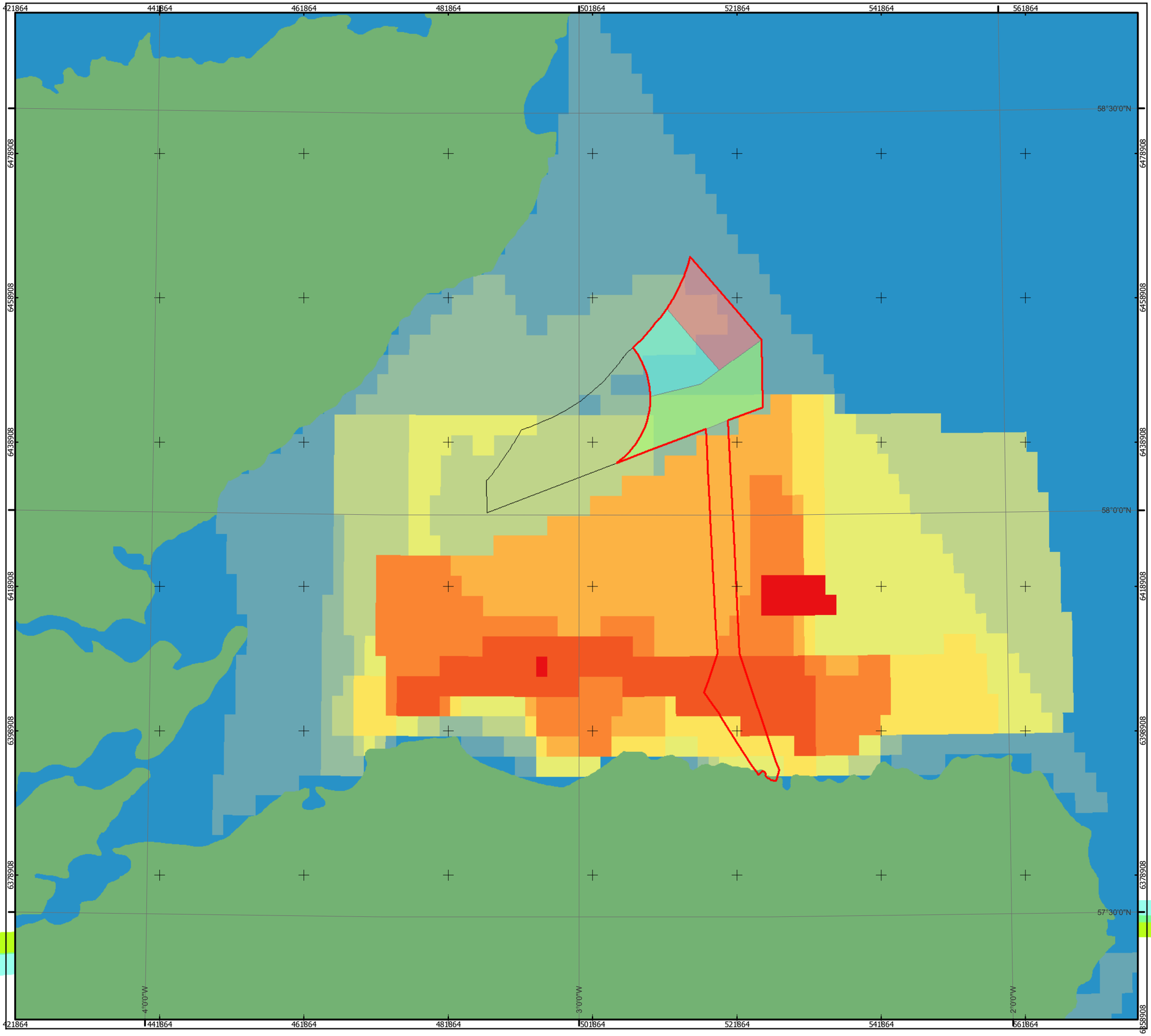
Produced: RP
Reviewed: ES
Approved: PM

Date: 18/06/2014 | Revision: C

REF: 8460001-PSO0162-BMM-MAP-018

Figure 5.22
ScotMap - Nephrops Trawls, Number of Vessels (2007 - 2011)

Moray Offshore Renewables Ltd



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REPSOL

Moray Offshore Renewables Ltd

KEY

- Modified Offshore Transmission Infrastructure
- MacColl
- Stevenson
- Telford
- Western Development Area

Monetary Value (£)

- Low
- High

Horizontal Scale: 1:500,000 A3 Chart

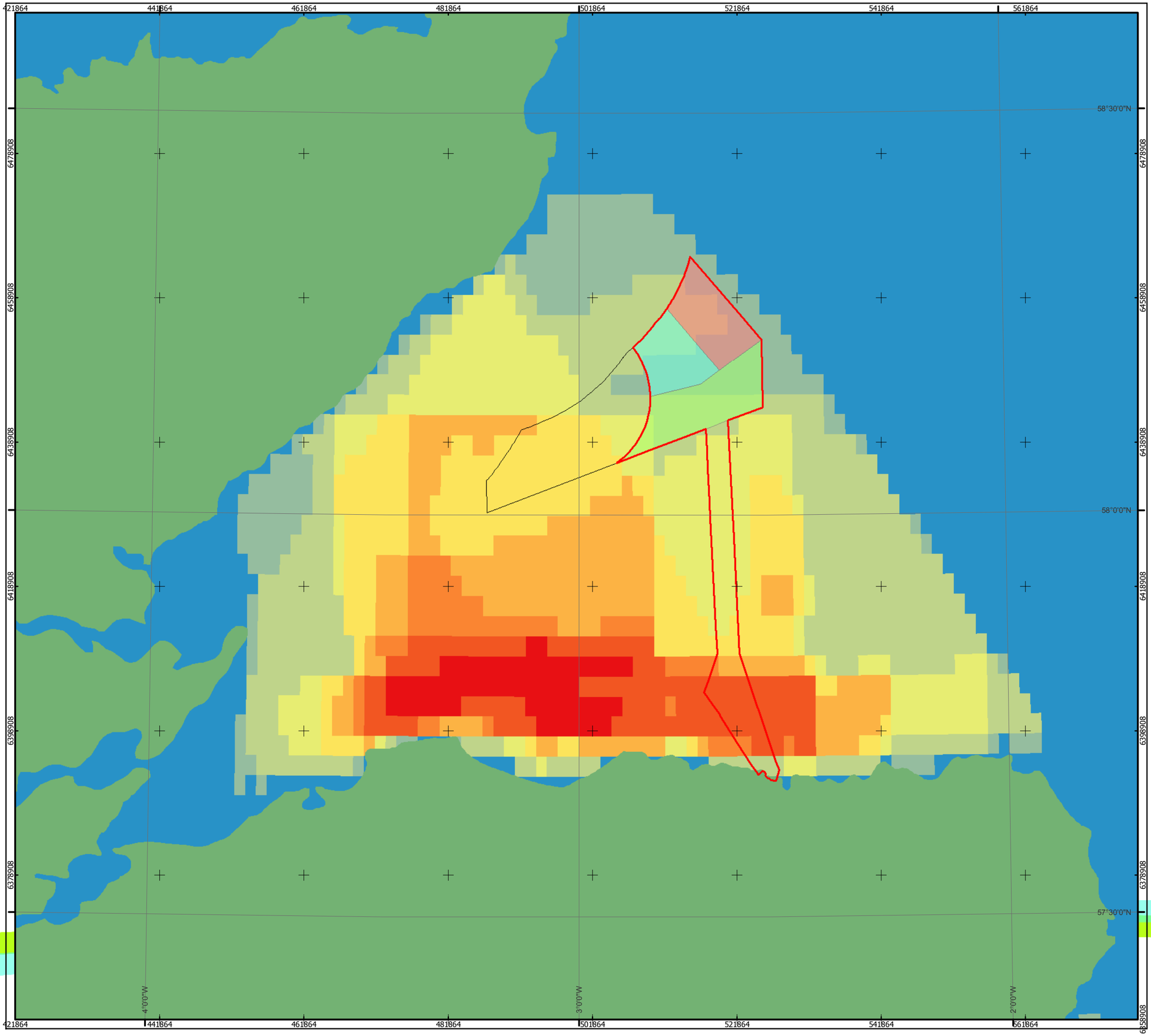
0 12,000 24,000 Meters

N

Geodetic Parameters:	WGS84 UTM Zone 30N
Produced: RP Reviewed: ES Approved: PM	
Date: 09/06/2014	Revision: B
REF: 8460001-PSO0162-BMM-MAP-019	

Figure 5.23 - ScotMap Trawls (Squid and Whitefish), Monetary Value (2007 - 2011)

Moray Offshore Renewables Ltd



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REPSOL

Moray Offshore Renewables Ltd

KEY

- Modified Offshore Transmission Infrastructure
- MacColl
- Stevenson
- Telford
- Western Development Area

Number of Vessels

- Low
- High

Horizontal Scale: 1:500,000 A3 Chart

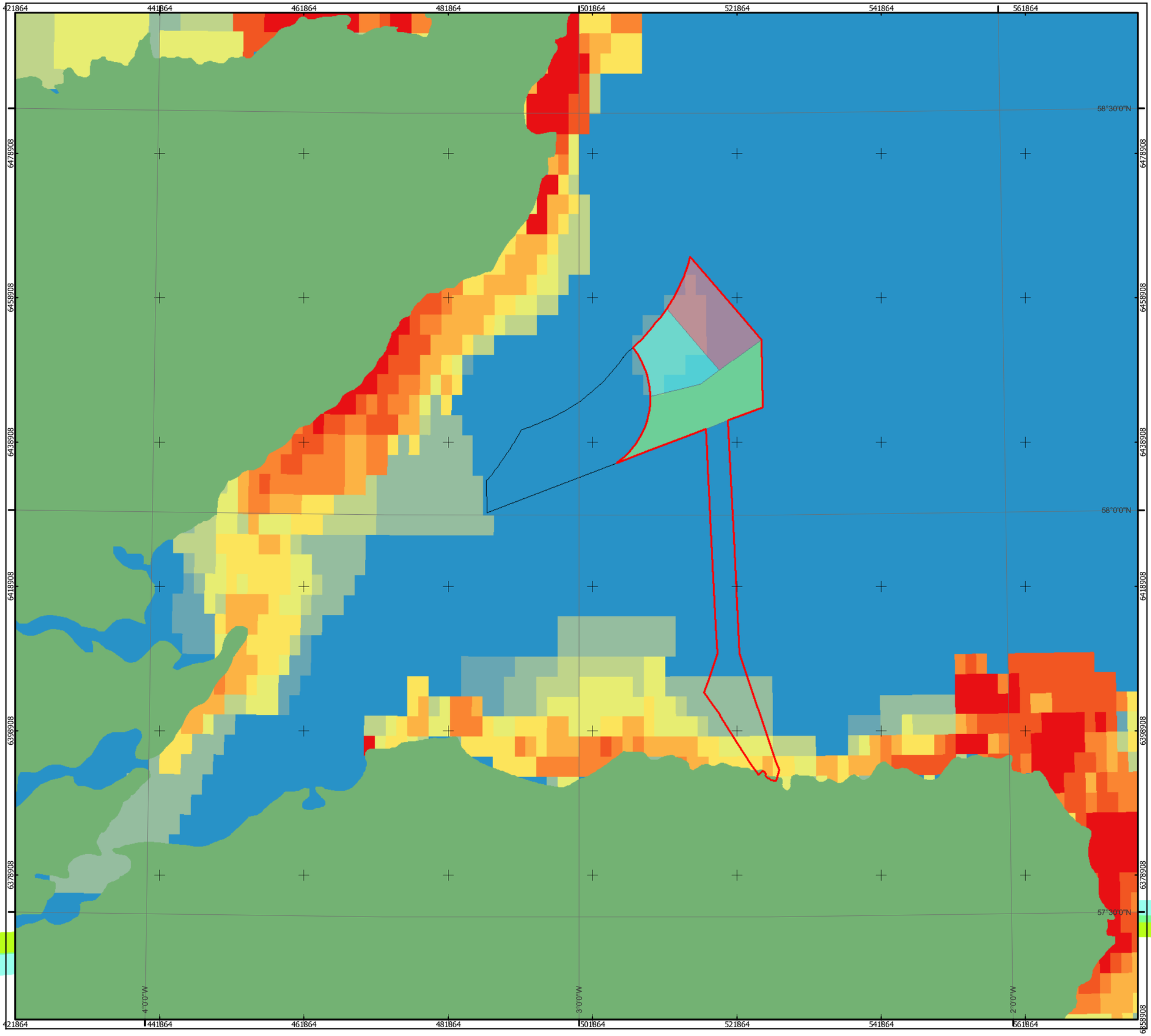
0 12,000 24,000 Meters

N

Geodetic Parameters:	WGS84 UTM Zone 30N
Produced: RP Reviewed: ES Approved: PM	
Date: 18/06/2014	Revision: C
REF: 8460001-PSO0162-BMM-MAP-020	

Figure 5.24 ScotMap - Trawls (Squid and Whitefish), Number of Vessels (2007 - 2011)

Moray Offshore Renewables Ltd



Moray Offshore Renewables Ltd

KEY

Monetary Value (£)

- Low
- High

Horizontal Scale: 1:500,000 A3 Chart

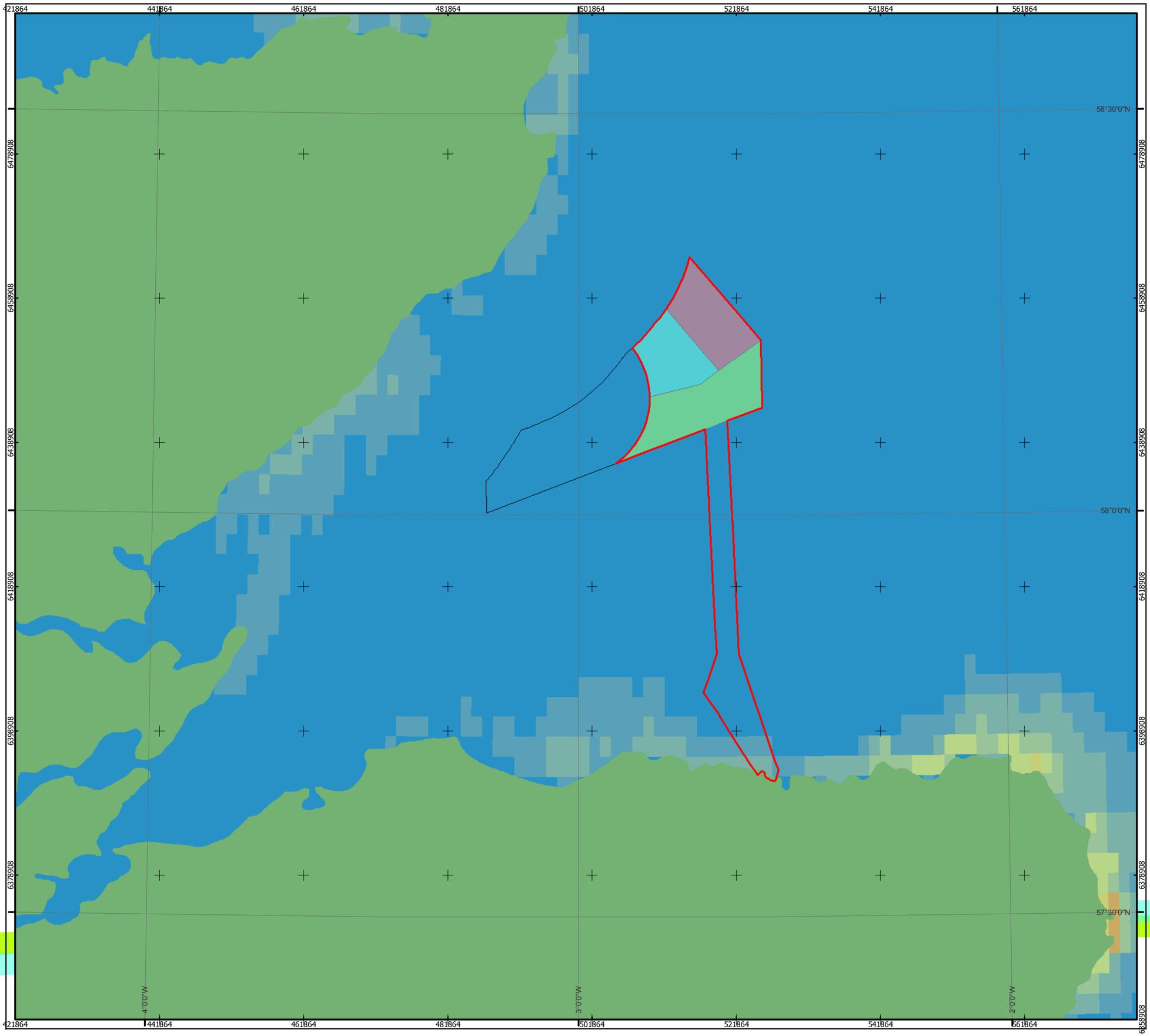
0 12,000 24,000 Meters

N

Geodetic Parameters:	WGS84 UTM Zone 30N
Produced: RP Reviewed: ES Approved: PM	
Date: 18/06/2014	Revision: C
REF: 8460001-PSO0162-BMM-MAP-021	

Figure 5.25
ScotMap - Creels, Monetary Value
(2007 - 2011)

Moray Offshore
Renewables Ltd



Moray Offshore Renewables Ltd

KEY

- Modified Offshore Transmission Infrastructure
- MacColl
- Stevenson
- Telford
- Western Development Area

Number of Vessels

- Low
- High

Horizontal Scale: 1:500,000 A3 Chart

0 12,000 24,000 Meters

N

Geodetic Parameters: WGS84 UTM Zone 30N

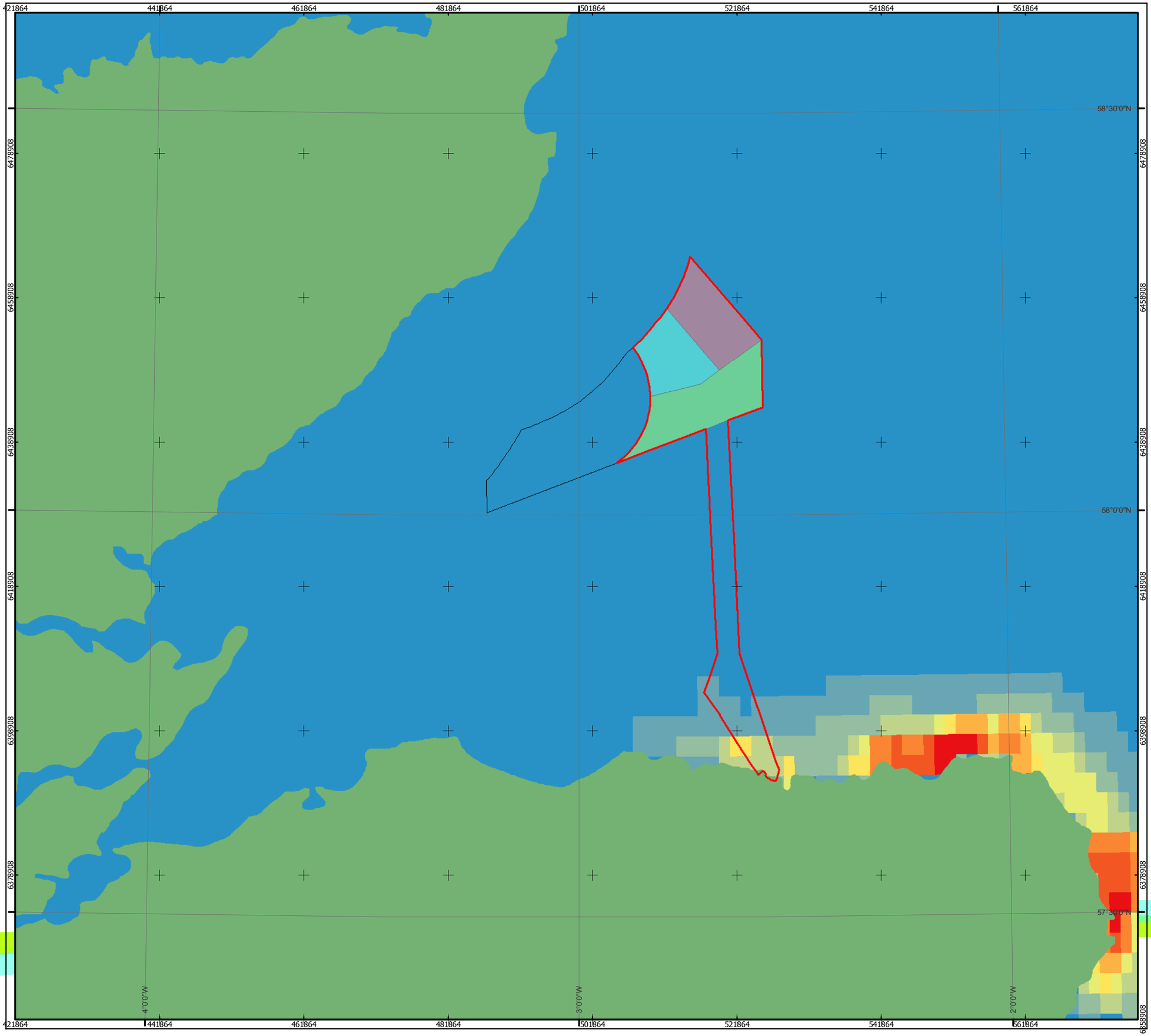
Produced: RP
Reviewed: ES
Approved: PM

Date: 18/06/2014 | Revision: C

REF: 8460001-PSO0162-BMM-MAP-022

Figure 5.26
ScotMap - Creels,
Number of Vessels (2007 - 2011)

Moray Offshore
Renewables Ltd



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REPSOL

Moray Offshore Renewables Ltd

KEY

- Modified Offshore Transmission Infrastructure
- MacColl
- Stevenson
- Telford
- Western Development Area

Monentary Value (£)

- Low
- High

Horizontal Scale: 1:500,000 A3 Chart

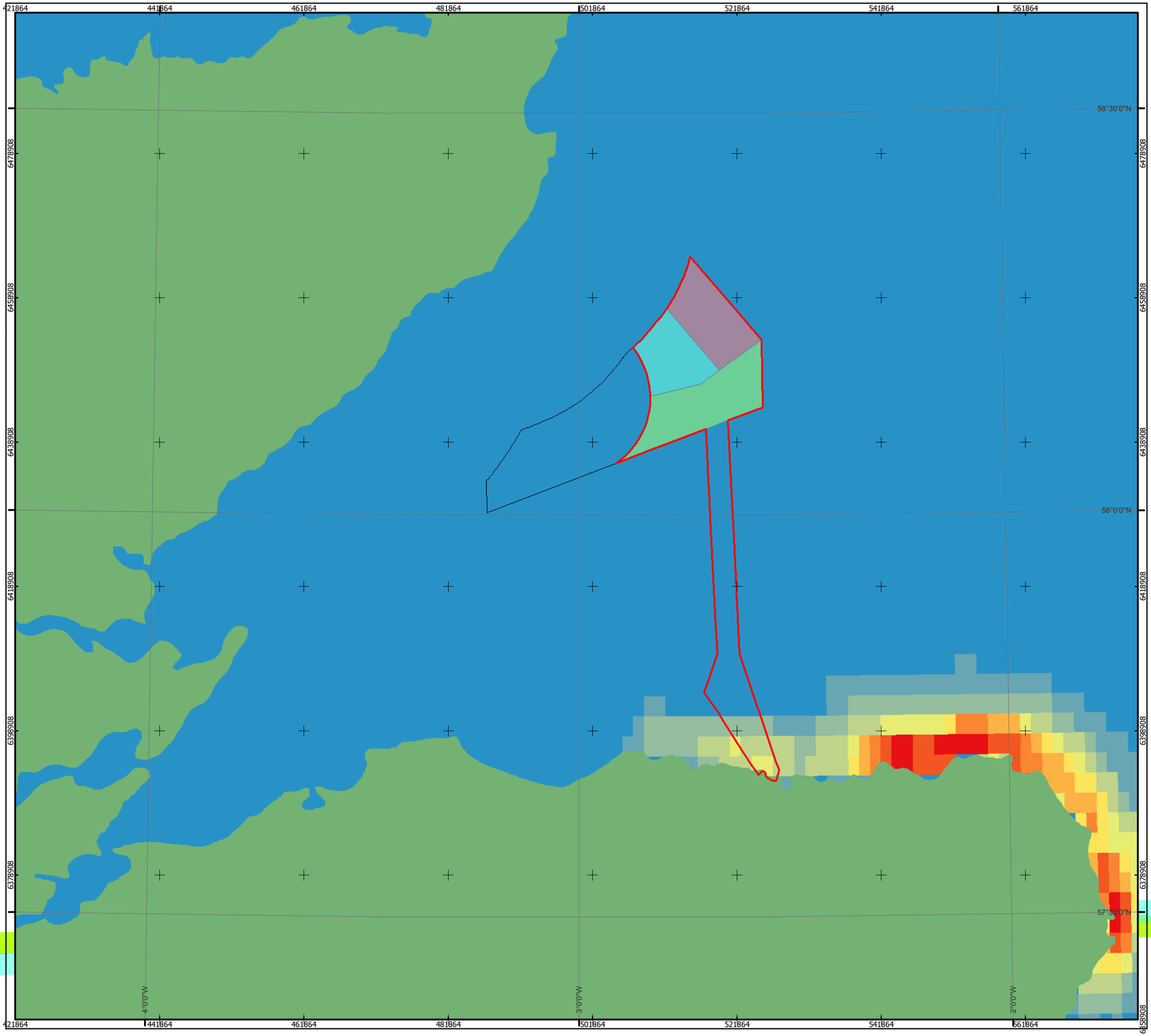
0 12,000 24,000 Meters

N

Geodetic Parameters:	WGS84 UTM Zone 30N
Produced: RP Reviewed: ES Approved: PM	
Date: 18/06/2014	Revision: C
REF: 8460001-PSO0162-BMM-MAP-023	

Figure 5.27
ScotMap - Mackerel Lines, Monetary Value (2007 - 2011)

Moray Offshore Renewables Ltd



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REPSOL

Moray Offshore Renewables Ltd

KEY

- Modified Offshore Transmission Infrastructure
- MacColl
- Stevenson
- Telford
- Western Development Area

Number of Vessels

- Low
- High

Horizontal Scale: 1:500,000 A3 Chart

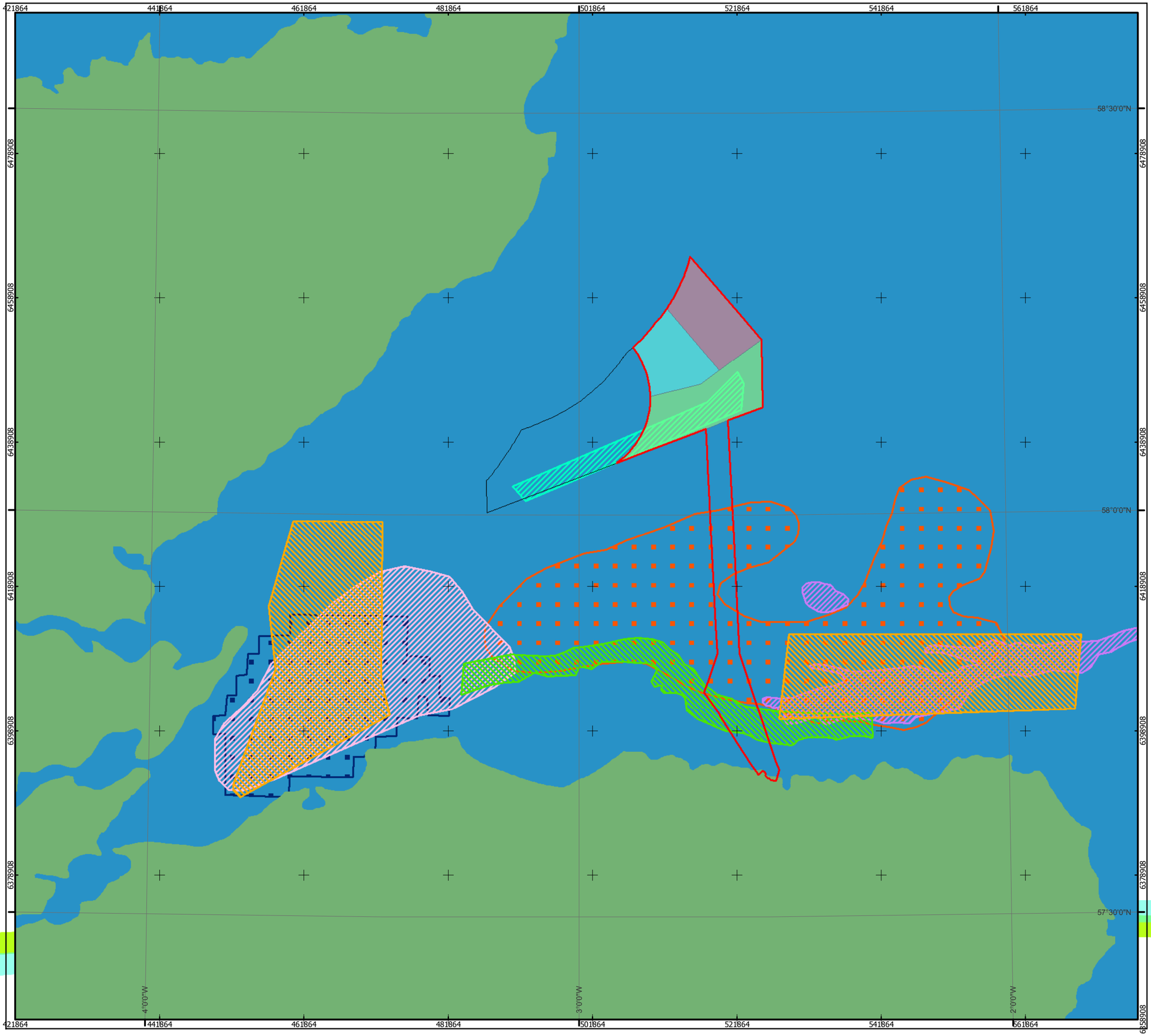
0 12,000 24,000 Meters

N

Geodetic Parameters:	WGS84 UTM Zone 30N
Produced: RP Reviewed: ES Approved: PM	
Date: 18/06/2014	Revision: C
REF: 8460001-PSO0162-BMM-MAP-024	

Figure 5.28
ScotMap - Mackerel Lines, Number of Vessels (2007 - 2011)

Moray Offshore Renewables Ltd



Moray Offshore Renewables Ltd

KEY

- Modified Offshore Transmission Infrastructure
- MacColl
- Stevenson
- Telford
- Western Development Area
- Predominantly Over-15m Scallop Grounds (Note 1)
- Predominantly Under-15m Scallop Grounds (Note 2)

Previously Collected Nephrops Grounds (2011)

- Vessel 1
- Vessel 2
- Vessel 3
- Vessel 4
- Vessel 5

Note 1 - Data collected from MSS VMS of Nephrops grounds
Note 2 - Data collected from MSS ScotMap of Nephrops vessels
Both data sources have been discussed and approved by the SFF during consultation

Horizontal Scale: 1:500,000 A3 Chart

0 12,000 24,000 Meters

N

Geodetic Parameters: WGS84 UTM Zone 30N

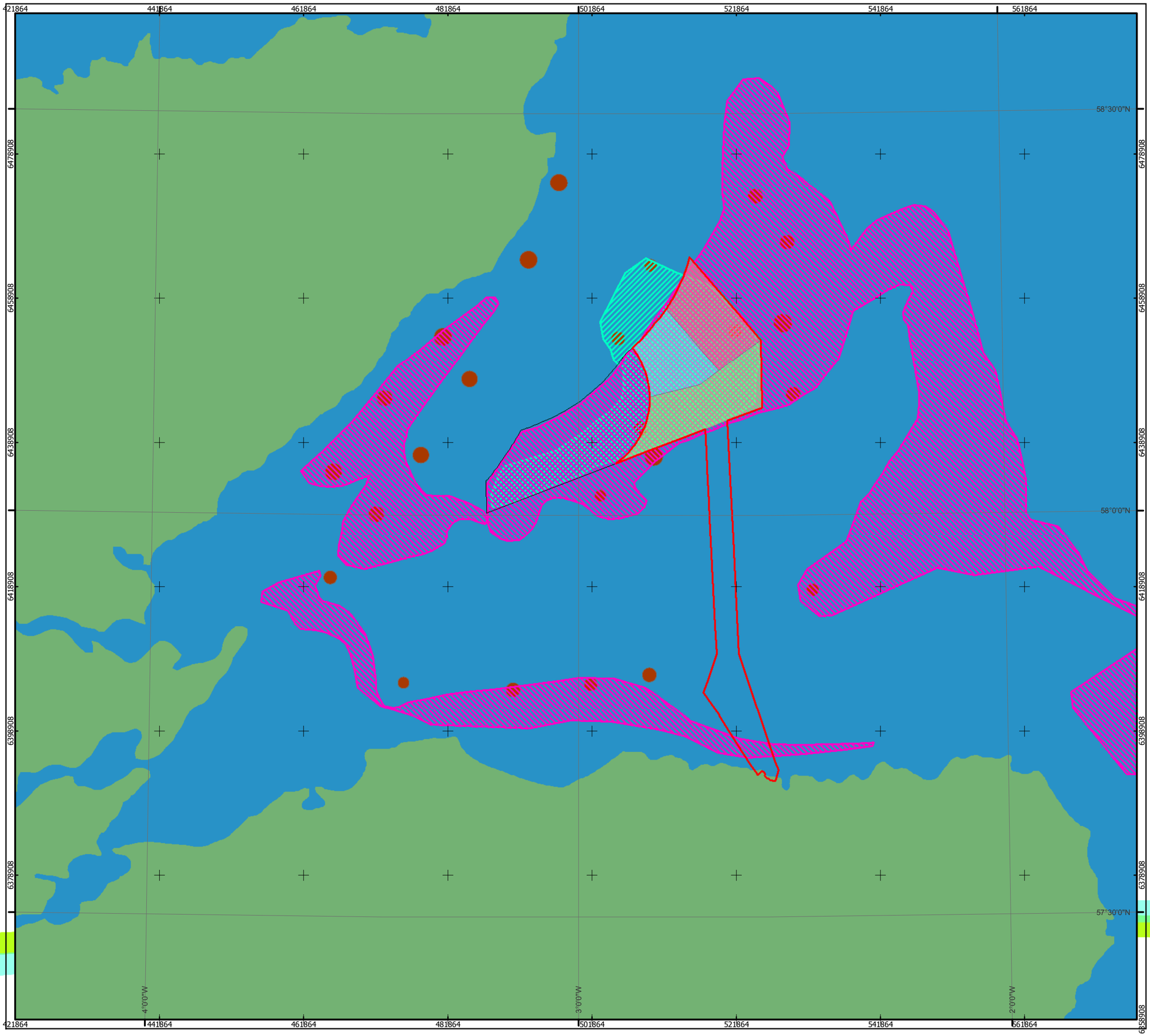
Produced: RP
Reviewed: ES
Approved: PM

Date: 18/06/2014 | Revision: C

REF: 8460001-PSO0162-BMM-MAP-025

Figure 5.29
Nephrops Fishing Grounds

Moray Offshore Renewables Ltd



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REPSOL

Moray Offshore Renewables Ltd

KEY

- Modified Offshore Transmission Infrastructure
- MacColl
- Stevenson
- Telford
- Western Development Area

Previously Collected Scallop Grounds (2011)

- Vessel 1
- Vessel 2
- Vessel 3

Horizontal Scale: 1:500,000 A3 Chart

0 12,000 24,000 Meters

N

Geodetic Parameters: WGS84 UTM Zone 30N

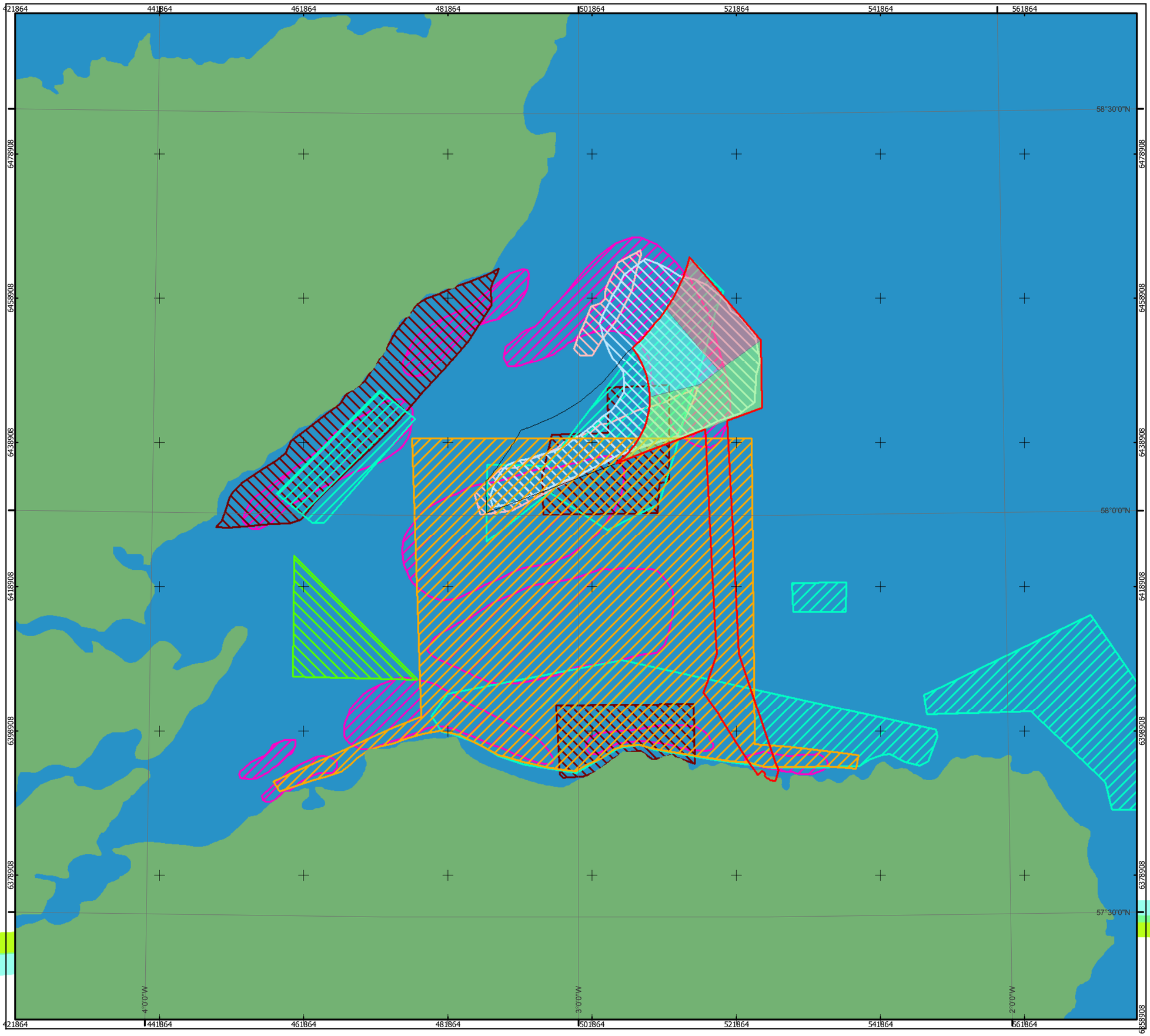
Produced: RP
Reviewed: ES
Approved: PM

Date: 18/06/2014 | Revision: C

REF: 8460001-PSO0162-BMM-MAP-026

Figure 5.30
Scallop Fishing Grounds

Moray Offshore Renewables Ltd



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REPSOL

Moray Offshore Renewables Ltd

KEY

- Modified Offshore Transmission Infrastructure
- MacColl
- Stevenson
- Telford
- Western Development Area

Previously Collected Squid Grounds (2011)

- Vessel 1
- Vessel 2
- Vessel 3
- Vessel 4
- Vessel 5
- Vessel 6
- Vessel 7

Horizontal Scale: 1:500,000 A3 Chart

0 12,000 24,000 Meters

N

Geodetic Parameters: WGS84 UTM Zone 30N

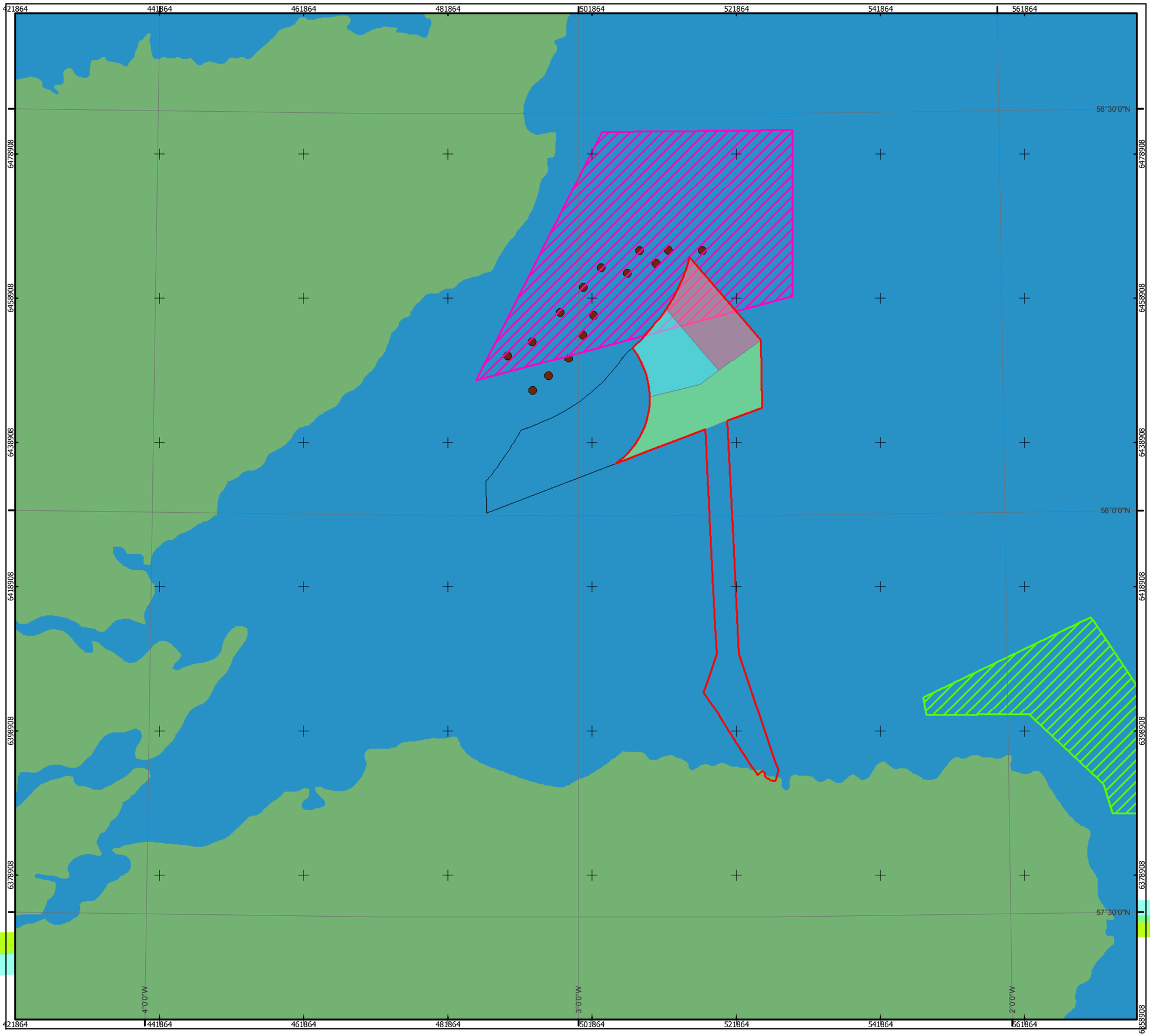
Produced: RP
Reviewed: ES
Approved: PM

Date: 18/06/2014 | Revision: C

REF: 8460001-PSO0162-BMM-MAP-027

Figure 5.31
Squid Fishing Grounds

Moray Offshore Renewables Ltd



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REPSOL

Moray Offshore Renewables Ltd

KEY

- Modified Offshore Transmission Infrastructure
- MacColl
- Stevenson
- Telford
- Western Development Area

Previously Collected Whitefish Grounds (2011)

- Vessel 1
- Vessel 2
- Vessel 3

Horizontal Scale: 1:500,000 A3 Chart

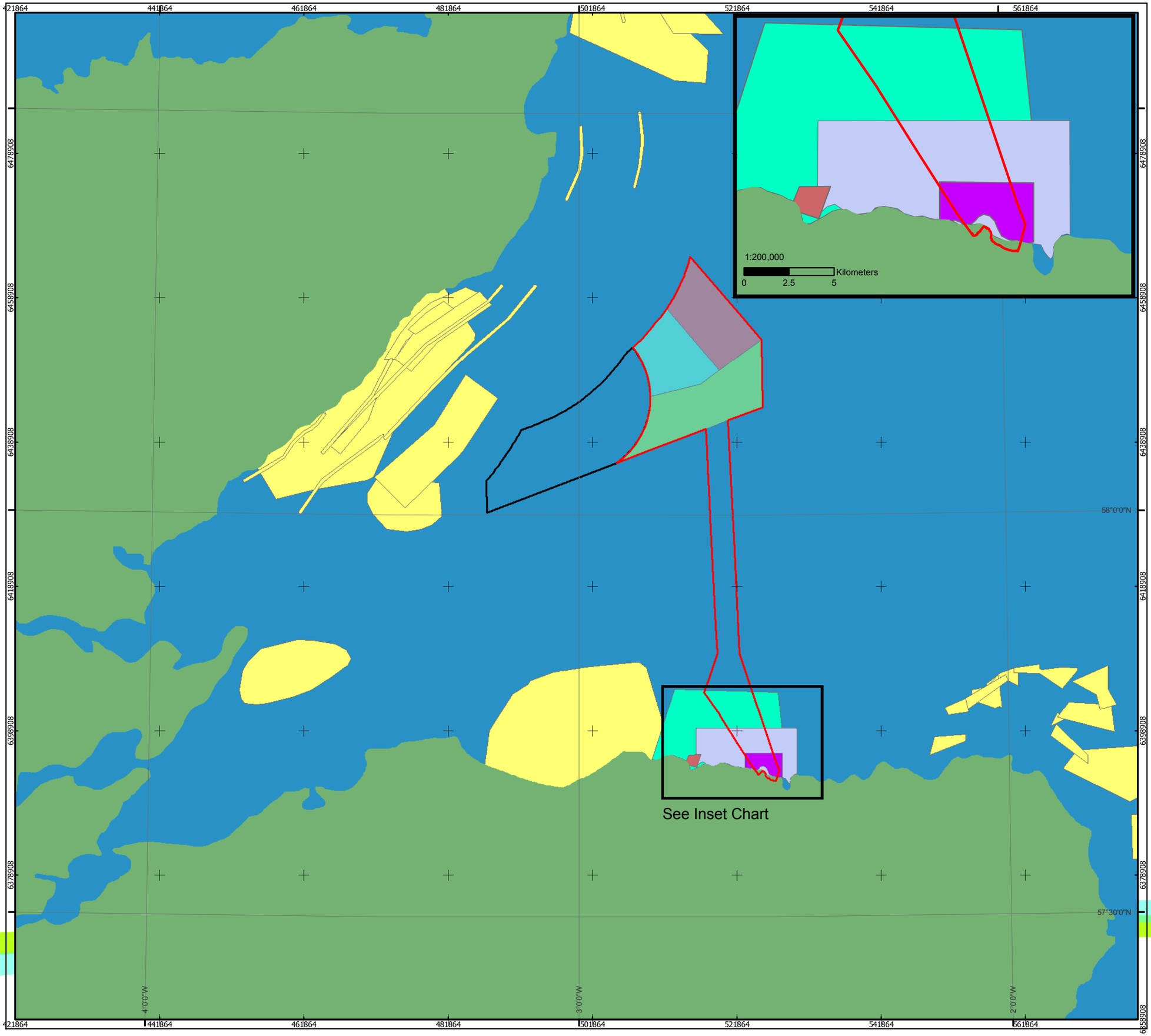
0 12,000 24,000 Meters

N

Geodetic Parameters:	WGS84 UTM Zone 30N
Produced: RP Reviewed: ES Approved: PM	
Date: 18/06/2014	Revision: C
REF: 8460001-PSO0162-BMM-MAP-028	

Figure 5.32
Whitefish Fishing Grounds

Moray Offshore Renewables Ltd



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REPSOL

Moray Offshore Renewables Ltd

KEY

- Modified Offshore Transmission Infrastructure
- MacColl
- Stevenson
- Telford
- Western Development Area
- Inverboyndie Landfall Site (5 vessel)

Creel Grounds

- Sandend Landfall Site (1 vessels)
- Inverboyndie Landfall Site (1 vessel)
- Inverboyndie Landfall Site (1 vessel)
- Previously Collected Creel Grounds (2011)

Horizontal Scale: 1:500,000 A3 Chart

0 12,000 24,000 Meters

N

Geodetic Parameters:	WGS84 UTM Zone 30N
Produced: RP Reviewed: ES Approved: PM	
Date: 18/06/2014	Revision: C
REF: 8460001-PSO0162-BMM-MAP-029	

Figure 5.33
Creel Fishing Grounds

Moray Offshore Renewables Ltd