



## **Rampion Offshore Wind Farm**



### **ES Section 18 – Commercial Fisheries**

**RSK Environmental Ltd**

**Document 6.1.18**

**December 2012**

**APFP Regulation 5(2)(a)**

**Revision A**

**E.ON Climate & Renewables UK Rampion Offshore Wind Limited**

**CONTENTS**

|           |                                       |             |
|-----------|---------------------------------------|-------------|
| <b>18</b> | <b>COMMERCIAL FISHERIES.....</b>      | <b>18-1</b> |
| 18.1      | Introduction .....                    | 18-1        |
| 18.2      | Legislation and Policy Context .....  | 18-1        |
| 18.3      | Assessment Methodology.....           | 18-6        |
| 18.4      | Environmental Baseline .....          | 18-11       |
| 18.5      | Predicted Impacts .....               | 18-23       |
| 18.6      | Mitigation Measures.....              | 18-55       |
| 18.7      | Significance of Residual Effects..... | 18-57       |
| 18.8      | Cumulative Impacts .....              | 18-57       |
| 18.9      | References .....                      | 18-67       |

**Tables**

|              |                                                                                                                                                                                                                            |       |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| Table 18.1:  | Scoping and consultation responses.....                                                                                                                                                                                    | 18-3  |
| Table 18.2:  | Draft ES responses .....                                                                                                                                                                                                   | 18-5  |
| Table 18.3:  | Sensitivity of commercial fishery receptors.....                                                                                                                                                                           | 18-9  |
| Table 18.4:  | Magnitude of impact.....                                                                                                                                                                                                   | 18-10 |
| Table 18.5:  | Significance of impact .....                                                                                                                                                                                               | 18-10 |
| Table 18.6:  | Wind farm design features and their influence on the Rochdale envelope for commercial fisheries .....                                                                                                                      | 18-23 |
| Table 18.7:  | Average landings values (2006-2010) of the top 10 Species (29E9, 29F0, 30E9 & 30F0 combined) and other hearing specialists by vessel length (Source: MMO, 2011) .....                                                      | 18-49 |
| Table 18.8:  | Average landings values (2006-2010) of the top 10 Species (29E9, 29F0, 30E9 & 30F0 combined) and other hearing specialists as a percentage of the total in each rectangle and by vessel category (Source: MMO, 2011) ..... | 18-50 |
| Table 18.9:  | Fishing gear seabed penetrations depths (Linnane <i>et al.</i> , 2000).....                                                                                                                                                | 18-52 |
| Table 18.10: | Proposed developments assessed for cumulative impacts on commercial fisheries.....                                                                                                                                         | 18-59 |
| Table 18.11: | Summary of residual effects and mitigation measures .....                                                                                                                                                                  | 18-64 |

**Figures**

|              |                                                                                                                                   |       |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------|-------|
| Figure 18.1: | The offshore project site in relation to ICES statistical rectangles.....                                                         | 18-7  |
| Figure 18.2: | Surveillance sightings of all fishing vessels (2001-2010) by nationality in the study area (Source: MMO, 2011).....               | 18-12 |
| Figure 18.3: | Historic fishing rights of non-UK vessels in the area relevant to the offshore project site (Source: Admiralty Chart Q6385) ..... | 18-13 |
| Figure 18.4: | Annual landings values (average 2001-2010) by method in the study area (Source: MMO, 2011).....                                   | 18-14 |
| Figure 18.5: | Annual landings values (average 2001-2010) by species in the regional area (Source: MMO, 2011).....                               | 18-15 |

|                                                                                                                            |       |
|----------------------------------------------------------------------------------------------------------------------------|-------|
| Figure 18.6: Annual landings values (average 2001-2010) by vessel category in the regional area (Source: MMO, 2011) .....  | 18-16 |
| Figure 18.7: Shoreham-based under-10m vessel engaged in cuttlefish trapping (source: BMM) .....                            | 18-18 |
| Figure 18.8: Belgian beam trawl VMS data (2009) (Source: ILVO) .....                                                       | 18-21 |
| Figure 18.9: Surveillance sightings of French vessels by method (2001-2010) in the regional area (Source: MMO, 2011) ..... | 18-22 |
| Figure 18.10: Fixed netting activity observed by SIFCA between 2004 and 2011 (Source: SIFCA, 2012) .....                   | 18-26 |
| Figure 18.11: Principal fixed net grounds as defined through consultation 2010-2011 (Source: BMM) .....                    | 18-27 |
| Figure 18.12: Principal drift net fishing grounds as defined through consultation 2010-2011 (Source: BMM) .....            | 18-28 |
| Figure 18.13: Drift netting activity observed by SIFCA between 2004 and 2011 (Source: SIFCA, 2012) .....                   | 18-29 |
| Figure 18.14: Crab and lobster potting grounds as defined from consultation 2010-2011 (Source: BMM) .....                  | 18-31 |
| Figure 18.15: Potting activity observed by SIFCA between 2004 and 2010 (Source: SIFCA, 2012) .....                         | 18-32 |
| Figure 18.16: Whelk fishing grounds as defined from consultation 2010-2011 (Source: BMM) .....                             | 18-33 |
| Figure 18.17: Whelk potting activity observed by Sussex IFCA between 2004 and 2011 (Source; SIFCA, 2012) .....             | 18-34 |
| Figure 18.18: Cuttlefish trapping grounds as defined from consultation 2010-2011 (Source: BMM) .....                       | 18-35 |
| Figure 18.19: Cuttlefish trapping activity observed by Sussex IFCA between 2004 and 2011 (Source: SIFCA, 2012) .....       | 18-36 |
| Figure 18.20: Otter trawling fishing grounds as defined through consultation 2010-2011 (Source: BMM) .....                 | 18-38 |
| Figure 18.21: Pair trawling fishing grounds as defined through consultation 2010-2011 (Source: BMM) .....                  | 18-39 |
| Figure 18.22: Beam trawl fishing ground as defined through consultation 2010-2011 (Source: BMM) .....                      | 18-41 |
| Figure 18.23: Local scallop dredging grounds as defined through consultation 2010-2011 (Source; BMM) .....                 | 18-42 |
| Figure 18.24: Location of the “9-Miler” scallop dredging ground (Source: Leech Fishing Ltd, 2012) .....                    | 18-43 |
| Figure 18.25: Scallop landings values by ICES rectangle (average (2001-2010)) (Source: MMO) .....                          | 18-45 |
| Figure 18.26: Belgian beam trawl VMS data (2009) (Source: ILVO) .....                                                      | 18-46 |

---

## 18 COMMERCIAL FISHERIES

---

### 18.1 Introduction

---

18.1.1 This section of the Environmental Statement (ES) presents an assessment of the potential impacts on commercial fisheries which might arise from construction, operation and decommissioning of the proposed Rampion Offshore Wind Farm (The Project). This assessment has been made using data gathered from desk-based studies and consultations.

18.1.2 This section addresses the following topics:

- Assessment methodology;
- An overview of the baseline;
- Assessment of the potential impacts on commercial fisheries, together with discussion of appropriate mitigation, and
- A summary of residual impacts in tabular form.

18.1.3 Commercial fishing for the purposes of this assessment is defined as the activity undertaken by licensed fishing vessels for the legitimate capture and sale of finfish and shellfish. The ecological aspects of all fish and shellfish species are covered in Section 8 - Fish and Shellfish. Aspects relating to safety of fishing vessels and their crews are covered in Section 14 - Navigation and Shipping.

18.1.4 This section uses a number of terms to describe fisheries. Key terms are:

- Demersal: fish found on or near the seabed, and/or fisheries that catch them;
- Pelagic: fish found in the water column, and/or fisheries that catch them;
- Gear: the type of equipment used by fisheries (e.g. crab pots, trawl nets).

### 18.2 Legislation and Policy Context

---

#### National Policy Statements

18.2.1 National Policy Statements (NPS) (DECC, 2011) are the principal policy documents for Nationally Significant Infrastructure Projects (NSIP). The following paragraphs provide detail from sections of the NPSs considered relevant to the assessment of impacts on commercial fisheries as a result of the Project.

18.2.2 Paragraphs 2.6.121 to 2.6.136 of EN-3 sets out offshore wind-specific commercial fisheries and fishing policy.

18.2.3 Paragraph 2.6.129 of EN-3 states that:

- 18.2.4 “The assessment by the applicant should include detailed surveys of the effects on fish stocks of commercial interest and any potential reduction in such stocks, as well as any likely constraints on fishing activity within the project’s boundaries. Robust baseline data should have been collected and studies conducted as part of the assessment”.
- 18.2.5 Paragraph 2.6.130 and 2.6.131 of EN-3 state that:
- 18.2.6 “Where there is a possibility that safety zones will be sought around offshore infrastructure, potential effects should be included in the assessment on commercial fishing” and
- 18.2.7 “Where the precise extents of potential safety zones are unknown, a realistic worst case scenario should be assessed. Applicants should consult the Maritime and Coastguard Agency (MCA). Exclusion of certain types of fishing may make an area more productive for other types of fishing. The assessment by the applicant should include detailed surveys of the effects on fish stocks of commercial interest and the potential reduction or increase in such stocks that will result from the presence of the wind farm development and of any safety zones.”

#### **Other Legislation & Guidance**

- 18.2.8 The additional legislation and guidance used for the undertaking of this assessment are as follows:
- British Wind Energy Association (BWEA). 2004. BWEA Recommendations for Fisheries Liaison;
  - Centre for Environment, Fisheries and Aquaculture Science (Cefas), Marine Consents and Environment Unit (MCEU), Department for Environment, Food and Rural Affairs (Defra) and Department of trade and Industry (DTI) 2004. Offshore Wind Farms – Guidance note for Environmental Impact Assessment in Respect of FEPA and CPA requirements – Version 2;
  - Department for Energy & Climate Change (DECC) 2009. UK Offshore Energy – Strategic Environmental Assessment;
  - Department for Business Enterprise & Regulatory Reform (BERR). 2008. Recommendations for Fisheries Liaison: FLOWW (Fishing Liaison with Offshore Wind and Wet Renewables Group);
  - UK Oil and Gas 2008. Fisheries Liaison Guidelines – Issue 5;
  - International Cable Protection Committee. 2006. Fishing and Submarine Cables – Working Together; and
  - Infrastructure Planning Commission (IPC) Scoping responses. 2010.

## Scoping

- 18.2.9 Initial consultation on the Project was carried out via the Rampion Offshore Wind Farm Scoping Document (E.ON/RSK, September 2010). Responses received are presented in the Infrastructure Planning Commission (IPC) Scoping Opinion report (IPC, October 2010). Further consultation exercises were also undertaken in 2012.
- 18.2.10 The information, advice and comments received during the scoping process with regard to commercial fisheries are summarised in Table 18.1, together with a list of the locations in the ES where these comments are addressed.

**Table 18.1: Scoping and consultation responses**

| Date         | Consultee                                | Summary of issues                                                                                                                                  | Sections where addressed                                                                                                                                                                                                         |
|--------------|------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| October 2010 | Infrastructure Planning Commission (IPC) | Confirmation is needed of consultation undertaken with appropriate UK and non-UK commercial fisheries                                              | Detailed consultation has been undertaken with local and regional UK fishermen and those from Belgium, France and the Netherlands. Details are presented in Appendix 18.1.                                                       |
|              |                                          | Detailed and helpful advice from the Marine Management Organisation (MMO) regarding additional data sources should be noted.                       | MMO data sources were used to inform the commercial fisheries baseline. Extensive consultation with the fishing industry, MMO local offices and Sussex Inshore Fisheries and Conservation Authority (IFCA) has also taken place. |
|              |                                          | All stages of the proposal should be assessed - construction, operation and decommissioning. Appropriate mitigation measures should be identified. | All stages of the proposal have been assessed and discussed within this ES. Mitigation options have been suggested within the ES, which will require agreement via the Rampion commercial fisheries working group.               |
|              |                                          | IPC does not agree that the assessment of the impact of the potential development on marine aggregate extraction can be scoped out of the ES       | Confirmation of the status of the proposed dredging area within the Offshore Project Area is addressed in Chapter 2a - Offshore Project Description.                                                                             |
| 11/10/10     | Natural England                          | Sussex Sea Fisheries District Committee (SSFC) (and partners) should be consulted for information.                                                 | E.ON & RSK met with SSFC in February 2011.                                                                                                                                                                                       |

| Date     | Consultee                            | Summary of issues                                                                                               | Sections where addressed                                                                                                                                                                                                                                                     |
|----------|--------------------------------------|-----------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 12/10/10 | Marine Management Organisation (MMO) | Strongly advise early consultation with fishing industry, MMO local offices and local sea fisheries committees. | Early and extensive consultation has occurred with local UK fishermen, their representatives, non-UK vessels and the Sussex IFCA. Information gathered has been used to compile the commercial fisheries baseline.                                                           |
|          |                                      | Locations of crab, lobster and whelk fisheries are not known                                                    | Charts of crab, lobster and whelk fishing grounds have been produced following consultation with the local UK fishing industry. Sussex IFCA data on gear type observations (2004 to 2007) have also be used. These charts are included in the commercial fisheries baseline. |
| 11/10/10 | East Sussex County Council           | SSFC should be consulted and their data sources utilised.                                                       | Consultation with the Sussex IFCA has been undertaken and their survey and annual report data have been utilised within the commercial fisheries baseline.                                                                                                                   |
|          |                                      | Little mention of displacement of activity                                                                      | Displacement of fishing activity is assessed as part of the loss of fishing grounds in this assessment.                                                                                                                                                                      |
|          |                                      | Data from Marine Conservation Zones (MCZ) / Balanced Seas should be used.                                       | This has been requested from committee members and included within the commercial fisheries baseline. The MCZs have also been included in determining the cumulative impacts of the offshore Project.                                                                        |

18.2.11 The scope of the assessment was modified accordingly to take account of the above consultee responses and the opinions of the IPC, the findings of which were reported in the Draft ES and subject to stakeholder consultation.

18.2.12 Key consultees provided responses to the Draft ES on commercial fisheries. These responses, and the modifications subsequently made to the final ES, are summarised in Table 18.2.

**Table 18.2: Draft ES responses**

| Date       | Consultee       | Summary of Issues                                                                                                                                                                                             | Action taken to address the Issue                                                                                                                                                                                                                                                                                                          |
|------------|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 30/07/2012 | Ifremer         | Updated information given on the levels of French fishing activity in 2008-2009 near the Rampion zone                                                                                                         | Ifremer data have been assessed and included in the baseline. However the data relate to the original zone 6 outline, and due to recent changes in the Offshore Project boundary, an updated assessment has been requested from Comité National des Pêche Maritimes et des Elevages Marins (CNPMM).                                        |
| 01/08/2012 | Monteum Limited | The Rampion zone is an area of high density / high value scallop dredging and beam trawling. During construction and operation large areas will be unfishable. What mitigation measures are being considered? | It is currently planned that during the construction phase there will be rolling exclusion zones around construction activities. Through the established fisheries working group appropriate and feasible mitigation measures are to be discussed and agreed for the construction and operational phases with fishermen's representatives. |
| 07/08/2012 | Sussex IFCA     | There is more up to date IFCA sightings data which should be used. Mitigation measures need to be developed further for the residual effects associated with construction and operation.                      | The IFCA sightings data (2004-2011) have been used in this ES chapter. Mitigation measures will be developed with fishermen's representatives through the fisheries working group.                                                                                                                                                         |
|            |                 | Would like to see costed commercial fisheries impact scenarios for noise avoidance, using Vanstaen <i>et al.</i> (2010)                                                                                       | Vanstaen <i>et al.</i> (2010) has been assessed and used during the assessment. The Commercial Fisheries Baseline includes the method specific SIFCA observations and VMS data as well as consultation charts which highlight the range, location, and fishing intensity of key grounds in relation to the wind farm and the cable route.  |

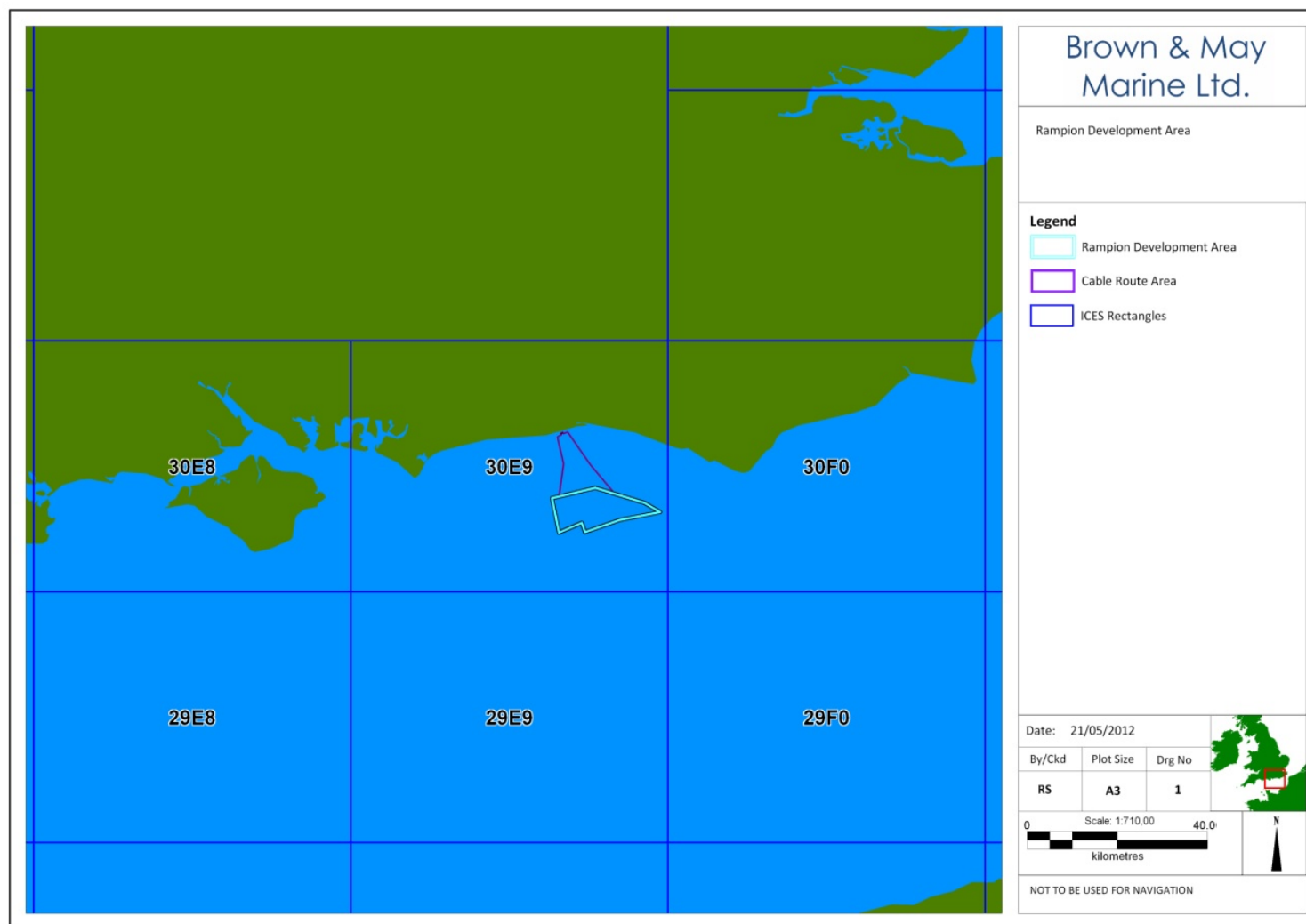


|            |                                                                  |                                                                                                                        |                                                                                                                                                                                                                                                                                                                                            |
|------------|------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|            |                                                                  |                                                                                                                        |                                                                                                                                                                                                                                                                                                                                            |
|            |                                                                  | Need to address the cumulative impact of the loss of fishing associated with appropriate MCZ implementation scenarios. | The report lists Defra's current position on the MCZs. It is impossible to state which sites will be implemented, delayed or rejected in 2013. The management measures of fishing methods within the MCZs have not yet been formulated and cannot be assessed.                                                                             |
| 07/08/2012 | French National Committee of Fisheries and Sea Farming (CNP MEM) | Lack of consultation with Haute Normandie Fishermen.                                                                   | Brown and May Marine (BMM) consulted with fishermen and local fishing organisations from Haute-Normandie including the president of the Comite Regional des Peches Maritimes et des Elevages Marins (CRPMEM), regional Producer Organisations (POs) and fishermen from Dieppe at a meeting held on 19th November 2011 in Boulogne-sur-Mer. |

### 18.3 Assessment Methodology

#### Establishment of Baseline Environment

- 18.3.1 The baseline has been compiled from both desk-based studies and consultation. However, commercial fishing is a diverse and constantly evolving industry, with fishing activity, target species, operating costs, market forces, legislation and regulation frequently changing. It should be noted, however, that this assessment can only be based on the current data available.
- 18.3.2 A detailed baseline study of commercial fisheries in the Project area was commissioned by E.ON, and is presented as Appendix 18.1. This section of the ES summarises the main findings of that detailed report. The local study area is based on data from one International Council for the Exploration of the Sea (ICES) reporting rectangle. ICES rectangles are blocks of sea of approximately 900nm<sup>2</sup>, and are a standard method of reporting fisheries landings. The Offshore Project and the export cable corridor fall entirely within ICES statistical rectangle 30E9 (Figure 18.1).



**Figure 18.1: The offshore project site in relation to ICES statistical rectangles**

18.3.3 There is currently no single data set or pre-defined model for establishing commercial fisheries baselines within small discrete sea areas such as wind farm sites. As such, in order to determine the levels of commercial fishing, a range of information and data sources were used. Emphasis has been placed upon undertaking direct consultation with the relevant national fishermen's federations, regional producer organisations, local associations and skippers fishing the project site. Data on landings, values, effort, surveillance and fishery types were collected from a number of sources (see Appendix 18.1 for details) and include but are not limited to the following:

- Marine Management Organisation (MMO);
- Data from Belgium, including the Institute for Agricultural and Fisheries Research (ILVO) and Rederscentrale – Ostende;
- Data from France, including Direction Départementale des Affaires Maritimes (France);
- Centre for Environment, Fisheries, and Aquaculture Science (Cefas);
- Sussex IFCA; and
- Consultation undertaken with Fisheries Officers, Fishermen's representative organisations, skippers, vessel owners and landing agents in the UK, Belgium and France.

#### Uncertainty and Technical difficulties encountered

18.3.4 It should be noted that there are limitations to some of the baseline data presented. For example, satellite tracking data relating to the density of fishing vessel activity is currently only available for vessels over 15m. In the case of the MMO fisheries statistics, for fishing vessels under-10m in length there is no requirement for the completion and submission of EU daily log book declarations on landings. Furthermore, as a consequence of its interpretation of the Data Protection Act, the fisheries statistics which the MMO is prepared to release for years since 2010 are incompatible with those of previous years and classify the majority of the data as confidential. MMO fisheries data for 2011 have therefore not been used. Surveillance data (e.g. by boat-based fisheries patrols, or aerial overflights) are also subject to limitations in their spatial and temporal coverage. A detailed description of limitations associated with each data source can be found in Appendix 18.1.

#### Identification and Assessment of Impacts and Mitigation Measures

18.3.5 The potential impacts to be assessed are as detailed in the Guidance Note for Environmental Impact Assessment in respect of FEPA and CPA requirements (Cefas, 2004). These are as follows:

- Complete loss or restricted access to traditional fishing grounds;
- Safety issues for fishing vessels (see Section 14 – Navigation and Shipping);
- Increased steaming times to fishing grounds;
- Interference with fisheries activities;
- Presence of seabed obstacles post construction; and
- Adverse impacts on commercially exploited species (see Section 8 – Fish and Shellfish Ecology). This includes consideration of the potential effect of underwater noise from piling during construction on commercially exploited species. Details of the methodology and impact assessment for noise are presented in Section 8 – Fish and Shellfish Ecology.

18.3.6 The potential impacts listed above are separately assessed for the construction, operational and decommissioning phases of the development. In the absence of detailed decommissioning plans, the impacts of decommissioning upon fishing activities are considered as no greater than those incurred during the construction phase.

18.3.7 To assess the potential impacts on commercial fisheries, consideration has been given to the following factors: importance and sensitivity of the receptor, magnitude of the impact; and the temporal nature of the impact.

18.3.8 The main characteristics used for defining the sensitivity of each of the receptor groups in terms of adaptability, tolerance, recoverability and value (dependence) are summarised in Table 18.3.

**Table 18.3: Sensitivity of commercial fishery receptors**

| Receptor sensitivity | Example                                                                                                                                                                                                                                                                                                                                                                                    |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| High                 | <ul style="list-style-type: none"> <li>• Low adaptability due to limited range and ability to deploy only one gear type</li> <li>• Limited spatial tolerance due to dependence upon a single fishing ground</li> <li>• Low recoverability due to inability to mitigate loss of fishing area by operating in alternative areas or using alternative methods</li> </ul>                      |
| Medium               | <ul style="list-style-type: none"> <li>• Some spatial adaptability due to extent of operational range and/or ability to deploy an alternative gear type</li> <li>• Moderate spatial tolerance due to dependence upon a limited number of fishing grounds</li> <li>• Limited recoverability with some ability to mitigate loss of fishing area by operating in alternative areas</li> </ul> |
| Low                  | <ul style="list-style-type: none"> <li>• High spatial adaptability due to extensive operational range and / or ability to deploy a number of gear types</li> <li>• High spatial tolerance due to ability to fish a moderate</li> </ul>                                                                                                                                                     |

| Receptor sensitivity | Example                                                                                                                                                                                           |
|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                      | <p>number of fishing grounds</p> <ul style="list-style-type: none"> <li>High recoverability due to ability to mitigate loss of fishing area by operating in range of alternative areas</li> </ul> |

**Table 18.4: Magnitude of impact**

| Magnitude  | Definitions                                                                                                      |
|------------|------------------------------------------------------------------------------------------------------------------|
| Large      | A high proportion of traditional fishing grounds occupied by the infrastructure or construction activities       |
| Medium     | A moderate proportion of traditional fishing grounds occupied by the infrastructure or construction activities   |
| Small      | A small proportion of traditional fishing grounds occupied by the infrastructure or construction activities      |
| Negligible | A negligible proportion of traditional fishing grounds occupied by the infrastructure or construction activities |
| Beneficial | Change is likely to benefit the integrity/value of the receptor                                                  |

18.3.9 Assessments have also taken into account the temporal nature of effects, with duration categorised as:

- Long term - Greater than 5 years;
- Medium term - 3 to 5 years; and
- Short term – less than 3 years

### Significance of Residual Impacts

18.3.10 The overall significance of residual impacts (those impacts remaining after the implementation of mitigation measures) has been determined by combining sensitivity of the receptor (Table 18.3) and the magnitude of the impact (Table 18.4), as presented in Table 18.5.

**Table 18.5: Significance of impact**

| Magnitude  | Sensitivity     |                |            |
|------------|-----------------|----------------|------------|
|            | High            | Medium         | Low        |
| Large      | Major           | Major/Moderate | Moderate   |
| Medium     | Major/ Moderate | Moderate       | Minor      |
| Small      | Moderate        | Minor          | Minor      |
| Negligible | Minor           | Negligible     | Negligible |

18.3.11 It should be noted that significance criteria cannot be applied in respect of the health and safety risks to fishing vessels and crews. In such instances, risks are assessed to be within or outside of acceptable limits. Further details can be found in Section 14 - Navigation and Shipping.

---

## 18.4 Environmental Baseline

---

### Nationality of Activity

- 18.4.1 Data from fisheries patrol aircraft, and satellite tracking, provide an indication of the nationality of vessels fishing in the project area. Within the export cable route corridor (all of which is inside the 6Nm boundary and therefore only legally fished by UK vessels), only UK vessels are recorded. However within the wind farm site, UK vessels and those from France and Belgium have been recorded (Figure 18.2). Belgian and French registered vessels are legally entitled to fish between the 6 and 12Nm limits, between which the Offshore Project is located (Figure 18.3).

### Fishing methods and species targeted

- 18.4.2 The area in which the offshore project site is located is identified by MMO statistics as being fished by vessels deploying a number of gear types, which in terms of landings values, are predominantly pots, mechanised dredges (for scallops), gill nets, beam, otter and pair trawls and traps (Figure 18.4).
- 18.4.3 Figure 18.5 illustrates the relative importance of target species within the regional area. As is apparent, in rectangle 30E9, covering the immediate offshore project site, sole, whelks, scallops, bass, lobsters and cuttlefish are the principal target species.
- 18.4.4 A feature of the fishery in the region in which the offshore project area is located is the versatility of the local vessels, a significant proportion of which are multipurpose, utilising a number of fishing gear types and targeting a range of species. For example, local under-10m vessels deploy traps for cuttlefish, pots for crabs, lobsters and whelks, fixed or drift nets for fish species such as sole, as well as hook and lining for bass. Similarly, local trawlers operate dredges for scallops, beam trawls for flatfish species, otter trawls for round fish species, as well as pair trawling for bass and black bream.

### Landings value by vessel size

- 18.4.5 Figure 18.6 shows the relative landings values and fishing effort for the regional area. Within 30E9, the highest proportions of values were recorded by under 10m vessels.
- 18.4.6 For under-10m vessels the highest values from potting are for whelks, lobsters, cuttlefish and crabs. Sole and bass account for the majority of netting landings. The landings values for traps are confined almost exclusively to cuttlefish. Otter trawling by under-10m vessels is generally of lower value than the other main methods with most of the value being derived from bass and sole. These vessels also undertake hook and line fishing for bass.

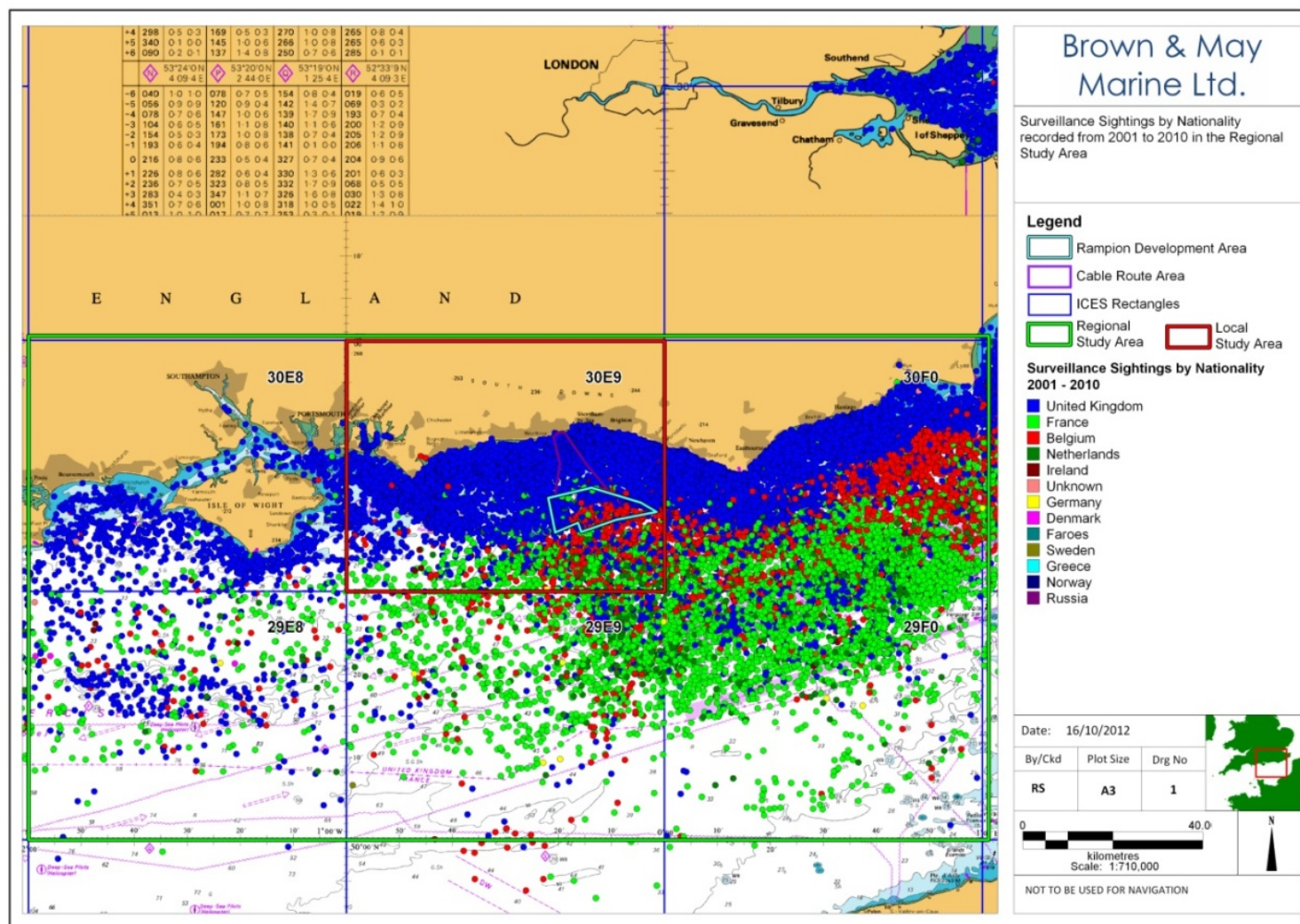
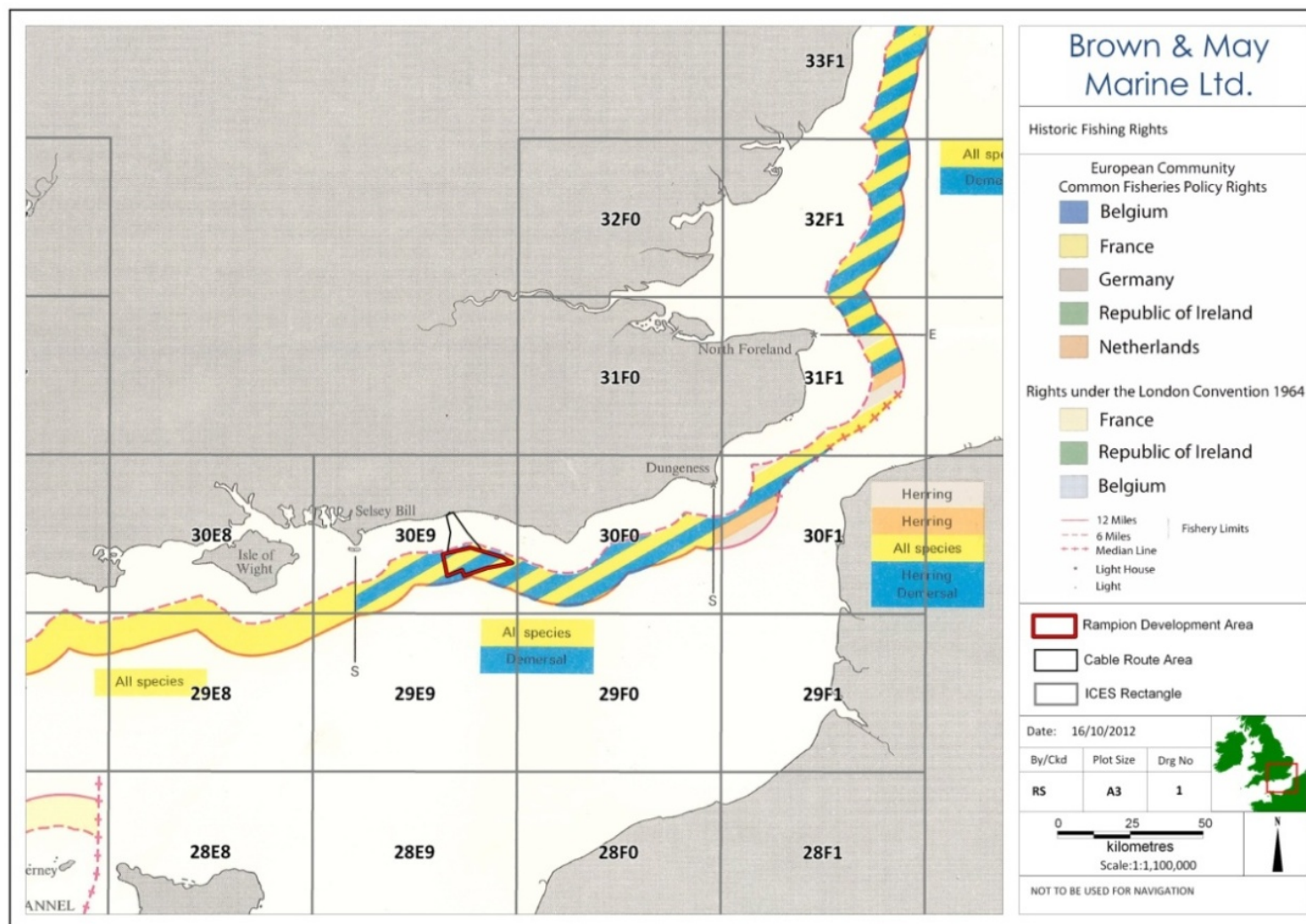


Figure 18.2: Surveillance sightings of all fishing vessels (2001-2010) by nationality in the study area (Source: MMO, 2011)





**Figure 18.3: Historic fishing rights of non-UK vessels in the area relevant to the offshore project site (Source: Admiralty Chart Q6385)**



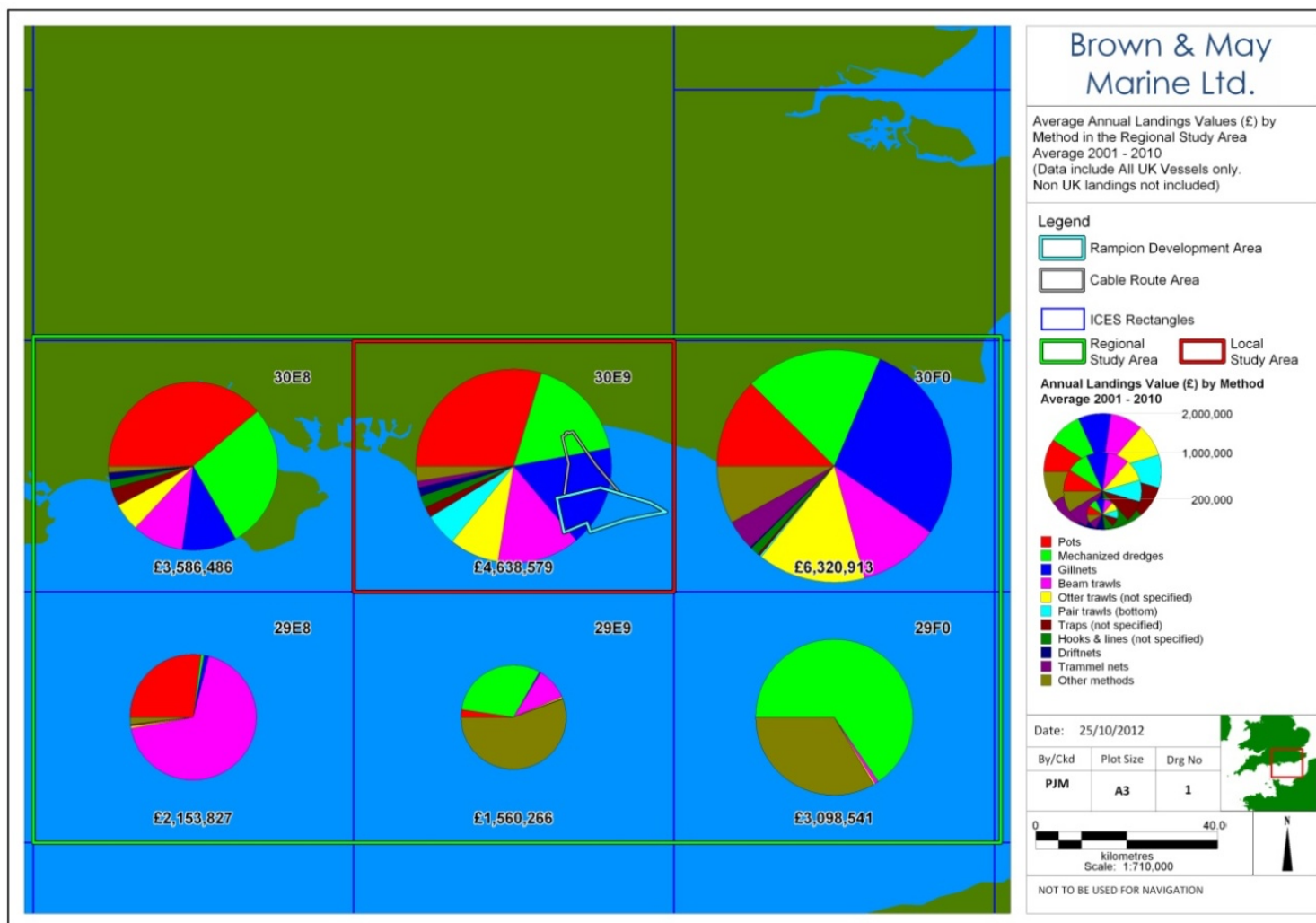
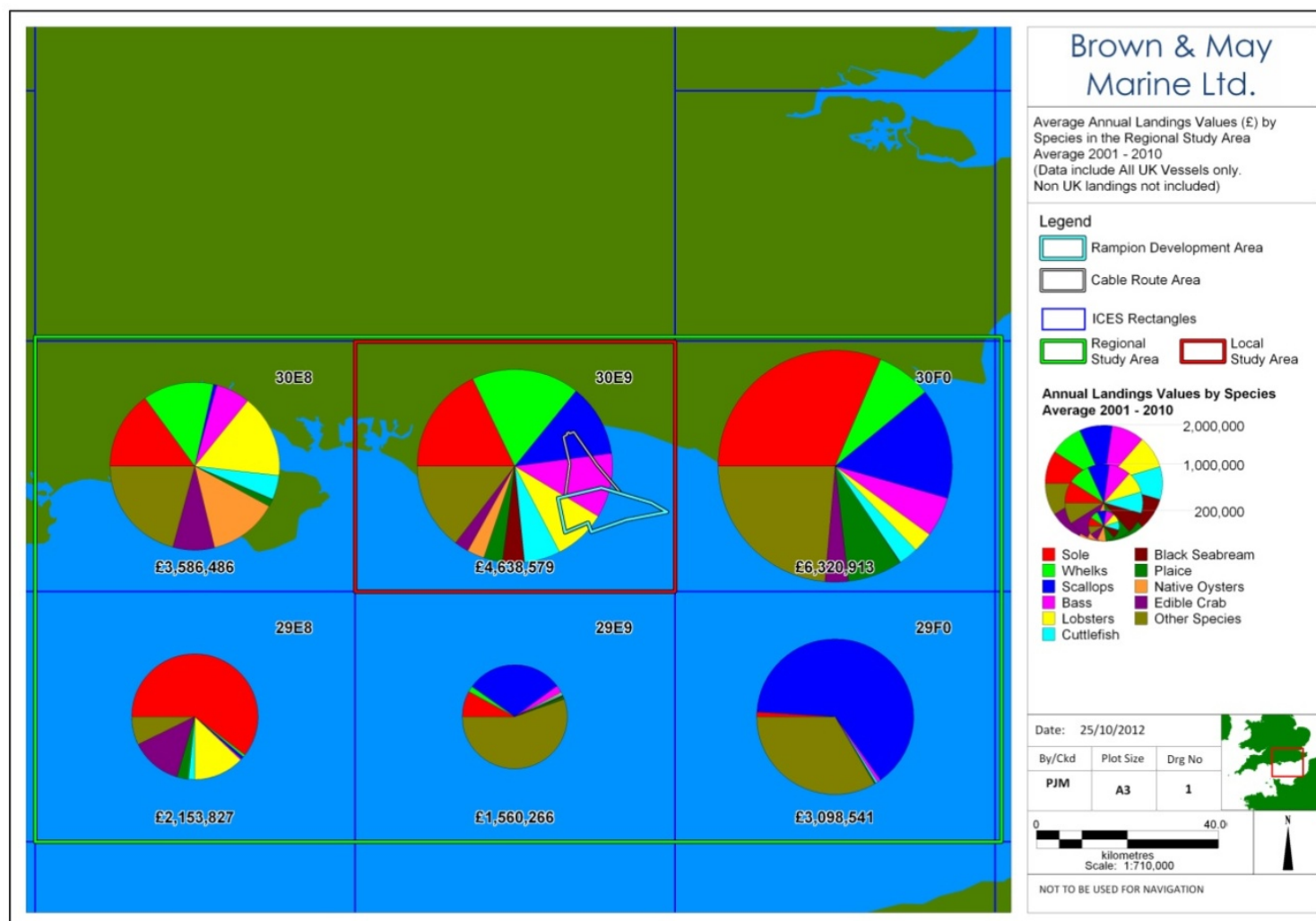


Figure 18.4: Annual landings values (average 2001-2010) by method in the study area (Source: MMO, 2011)



**Figure 18.5: Annual landings values (average 2001-2010) by species in the regional area (Source: MMO, 2011)**

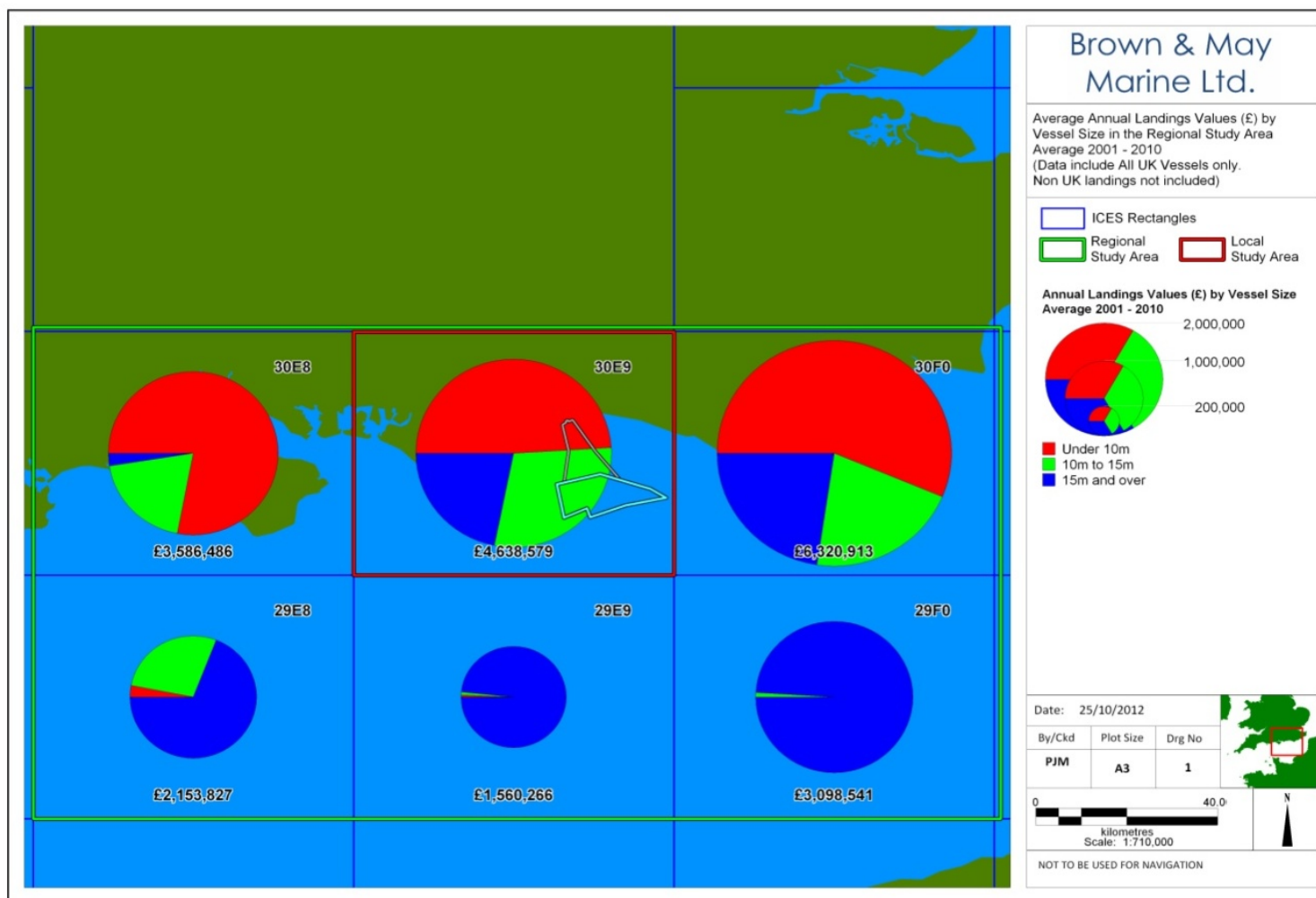


Figure 18.6: Annual landings values (average 2001-2010) by vessel category in the regional area (Source: MMO, 2011)

- 18.4.7 For UK 10-15m class of vessels involved in potting, whelks, lobsters, cuttlefish and crabs constitute the majority of the landings by value. For otter trawling, bass, squid and to a lesser extent plaice are the main species by value. For beam trawling the majority of landings values are from sole and plaice, and for dredging the majority of landings values are from scallops. For pair trawling the target species are almost entirely bass and black bream and for hooks and lines, the landings values are entirely from bass.
- 18.4.8 For the larger, over 15m class of vessels, mechanised dredging for scallops and beam trawling for soles and, to a lesser extent, other flatfish species, contribute the bulk of the landings values. Pair trawling for black bream, and mid-water and pair trawling for horse mackerel account for only moderate landing values.

#### Ports

- 18.4.9 The highest landings values from ICES rectangle 30E9 are into Shoreham, which serves as the home port for a significant number of the local vessels and is the main landing and selling port for inshore vessels from other ports such as Worthing and Brighton. Approximately 30% of the value of fish landed into Shoreham is recorded as being caught in rectangle 30E9. For smaller local ports such as Brighton, Littlehampton and Worthing, virtually all of the total landings values (albeit at much lower levels), are recorded as being caught in rectangle 30E9.
- 18.4.10 Catches from rectangle 30E9 also make a contribution to the landings recorded for Portsmouth and Brixham. As a number of the vessels (larger beam trawlers based at these ports) have engines of more than 300hp and are therefore prohibited from fishing within the 12nm limit, it is assumed that a proportion of the values into these ports from 30E9 will be from areas other than those of the project site.
- 18.4.11 Belgian vessels fishing in the area of the site are likely to be based in Ostende or Zeebrugge, while French vessels are likely to operate out of a number of ports on the northern coast of France.

#### Seasonality

- 18.4.12 Whilst potting occurs throughout the year, the highest levels of activity have been recorded in the spring and summer months. A similar pattern occurs with gill netting, otter trawling and hooks and lines, although the higher levels of activity continue into the autumn. A high proportion of mechanised dredging effort is recorded during the autumn and winter months from October to March. The higher beam trawling effort occurs in the autumn, as does trammel and drift netting activity. Pair trawling and trap fishing is shown to be highly seasonal and almost entirely confined to April, May and June, reflecting the seasonality of the local black bream and cuttlefish fisheries.

## Location of fishing grounds & gear type used

### Potting and trapping

- 18.4.13 For potting (based on Sussex IFCA data 2004-2011) inshore activity in the export cable route corridor appears to be relatively low compared to further west. However, consultation with fishermen indicates that both crab/lobster and whelk potting may occur in the wind farm site and the cable route corridor.
- 18.4.14 For crab and lobster, “fleets” of parlour or inkwell pots are typically deployed in groups of 10-50, which can be from 100-500m in length. Anchors and buoys are present at each end. The gear is usually left in the water for between 12 hours to two days. Plastic drum pots are used for whelks, with up to 80 per fleet and fleet lengths can be up to 0.5nm.
- 18.4.15 Trapping for cuttlefish (Figure 18.7) only takes place within a short inshore section of the cable route corridor. Cylindrical steel frames enclosed in mesh are weighted to the seabed and baited with a live female cuttlefish or a lure. As with potting, traps are shot in fleets of 500 to 600m in length, rigged 20 to 25 traps per fleet. The vessels engaging in potting and trapping are generally under-10m in length.

### Netting

- 18.4.16 For fixed and drift netting (based on Sussex IFCA observations 2004-2011) the activity is concentrated inshore and includes relatively high intensity fishing within the export cable route corridor. Consultation with fishermen suggests that principal netting grounds include both the wind farm site and the cable route corridor.
- 18.4.17 Netting is mostly undertaken by under-10m vessels and can either take the form of drift netting, or fixed (static) netting by anchors. Net lengths range from 200m to 1000m, but are most commonly around 500m. Soak times vary from a few hours for drift netting to 24-72 hours for fixed netting.



**Figure 18.7: Shoreham-based under-10m vessel engaged in cuttlefish trapping (source: BMM)**

### Otter trawling

- 18.4.18 For otter trawling both the Sussex IFCA data and consultation with fishermen show a similar pattern of activity occurring over the area in which the export cable is to be laid. The charts provided by skippers also show otter trawling grounds occurring in the majority of the offshore Project site.
- 18.4.19 The horizontal opening of the net is maintained by trawl doors, also known as otter boards. The otter trawling undertaken in the vicinity of the offshore Project is understood to be single net trawling with effective gear widths (i.e. the distance between the trawl doors) between 25 and 65m.

### Pair trawling

- 18.4.20 Pair trawling (where two boats tow a single net) in the area is principally for relatively fast-swimming black bream and bass. This activity takes place within the inshore part of the cable route corridor, with the highest intensity to the west of this corridor. Consultations with fishermen indicated that the northern part of the site is also used for pair trawling. The distances between vessels when fishing was stated to be between 65-200m.

### Hook and line

- 18.4.21 Rod and line fishing is often undertaken by netting fishermen in between deploying and retrieving their nets. The principal target species was stated to be bass and due to the quality of the fish caught by this method, catches attract a price premium.

### Scallop dredging

- 18.4.22 Scallop dredging activity (as reported by local fishermen) encompasses both the wind farm site and the cable route corridor. One particular ground, known as the “9 Miler”, is noted as being of particular importance to local scalloping vessels. A relatively small part of the “9 Miler” ground falls within the north-eastern part of the wind farm site. Satellite tracking data for over 15m UK vessels shows that the project site is located where medium levels of scallop dredging activity occurs, with higher levels occurring to the south-east and south-west.
- 18.4.23 The scallop dredges used in the area are known as a Newhaven or Springer type; attached to the leading edges are hinged, spring-loaded teeth bars to rake the scallops off the seabed and into the dredge bag. Typically for local vessels, five to eight dredges are attached to a steel beam, one on each side of the vessel, giving an effective gear width of 34m. In addition to local vessels, those based in Portsmouth and Plymouth also fish in the area. Larger “nomadic” vessels from the English, Scottish and Northern Irish fleets which fish areas around much of the UK, also fish the region in which the Offshore Project is located. These larger vessels can tow up to 20 dredges each side, with an effective gear width of up to 65m.

### Beam trawling

- 18.4.24 Satellite tracking data of over 15m vessels for the year 2009 indicate that part of the Offshore Project site sustains UK beam trawling effort by over-15.0m vessels, with some of the highest levels recorded within the region occurring just to the southwest of the Offshore Project site.
- 18.4.25 The UK beam trawlers operating within the project site and the export cable corridor are the small to medium class of vessels (12 to 18m in length). These vessels tow two beam trawls of 4.0 to 4.5m in length along the seabed, each weighing up to three tonnes.

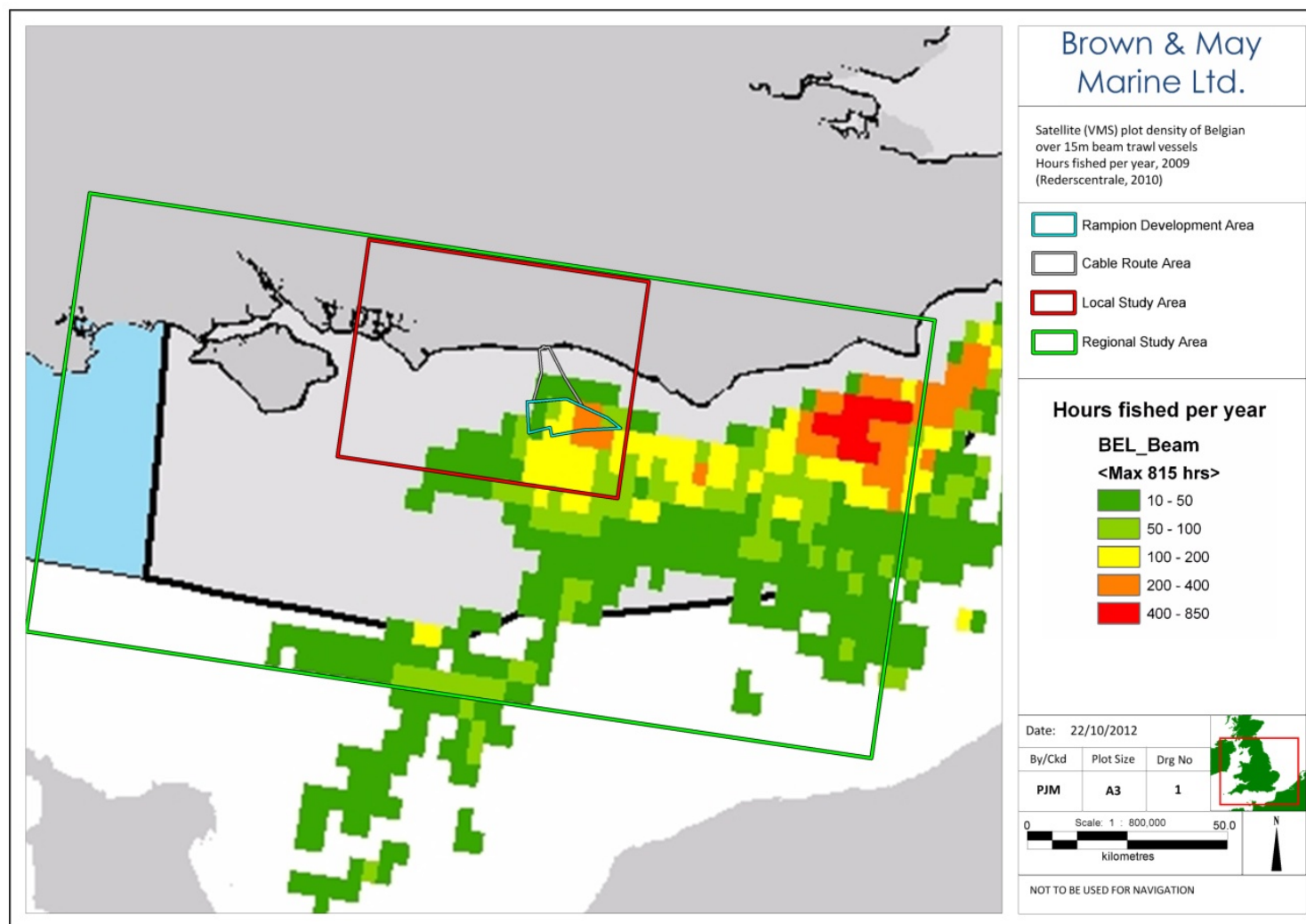
### Belgian fishing activity

- 18.4.26 Belgium has historic fishing rights between the UK's 6 and 12Nm territorial fishing limits, although only beam trawlers with main engines of less than 300hp are permitted to fish within the 12Nm limit. Some otter trawling by smaller Belgian vessels also takes place between the 6Nm and 12Nm limits.
- 18.4.27 Most Belgian activity in the project site is from vessels of over 15m in length and is generally concentrated in the central and eastern part of the project site as illustrated by VMS data (Figure 18.8). Sole, plaice, king scallops, bib, cuttlefish and lesser spotted dogfish comprise the major proportion of the landings from rectangle 30E9. A high proportion of Belgian beam trawling effort in the region occurs between November and March.

### French fishing activity

- 18.4.28 French vessels also have local historic fishing rights within the 6 to 12Nm limits, encompassing the project site. However, the site is to the north of the main fishing grounds with only a low number of surveillance sightings actually recorded within the Offshore Project boundaries (Figure 18.9). This is supported by the available VMS data. Consultation with fishermen's organisations (CRPMEM Nord Pas de Calais / Picardie and CRPMEM Haute-Normandie) indicated that 30 to 50 French vessels of lengths between 12 to 25m could fish the general project site area, with activity peaking in June to August. The French skippers consulted reported spending on average 3 weeks per year within the general project site area.
- 18.4.29 The majority of French vessels operating in the vicinity of the Offshore Project operate pelagic and demersal trawls, and dredges, with some gill-netters also possibly involved. Scallops, sole, saithe, herring, monkfish, cod, cuttlefish, plaice, rays, red mullet, dogfish and sea bream were stated to be the main species targeted in the general area of the project site.





**Figure 18.8: Belgian beam trawl VMS data (2009) (Source: ILVO)**



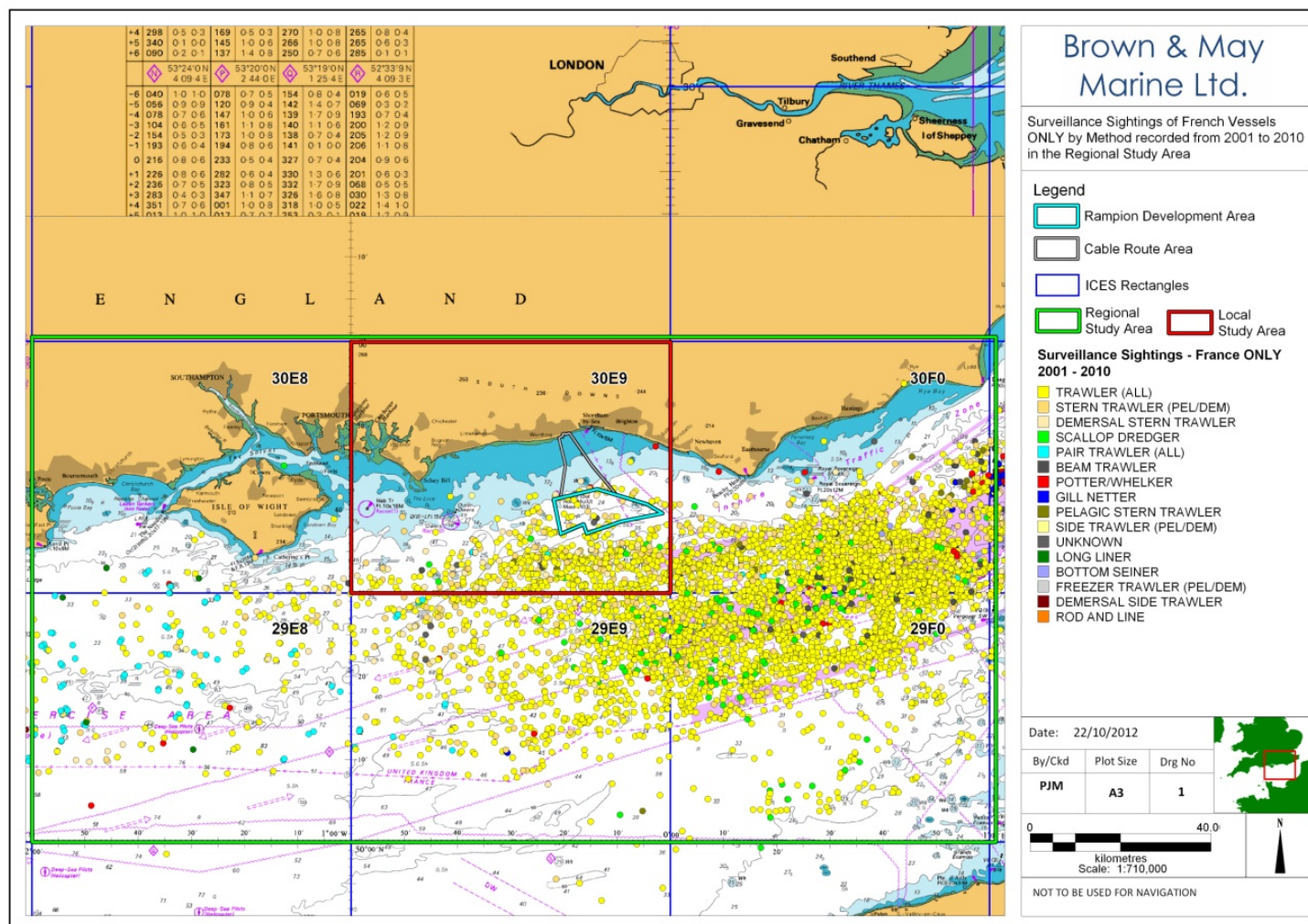


Figure 18.9: Surveillance sightings of French vessels by method (2001-2010) in the regional area (Source: MMO, 2011)

## 18.5 Predicted Impacts

- 18.5.1 Due to the uncertainties involved in predicting future fishing patterns, it is taken that the current baseline represents the worst realistic case in terms of the levels of fishing activity within the project site, i.e., it has been assumed that there will not be a substantial increase in activity in the absence of the Rampion project.
- 18.5.2 The “Rochdale Envelope” approach has been applied to identify the parameters which constitute the worst case scenario (greatest potential impact) with regard to impacts on fishing activities.
- 18.5.3 The realistic worst case could impact on commercial fishing activities in two ways: the first is for the offshore Project to cause adverse impacts to fish and shellfish population of commercial importance leading to changes in behavior or a decline in the population within a fishery. Secondly, the Project and associated structures can constitute a physical obstacle or a risk to the continuation of normal fishing activities as detailed in the baseline. The impact on fish and shellfish populations is assessed in Section 8 - Fish and Shellfish Ecology and therefore the second forms the basis of the following assessment.
- 18.5.4 It should, however, be recognised that it is unlikely that all of the worst case scenarios will occur and, as such, the actual significance of impacts may be lower than as assessed below.
- 18.5.5 A summary of the design parameters assessed as the worst case scenario are provided in Table 18.6. These have been derived from Section 2a - Offshore Project Description.

**Table 18.6: Wind farm design features and their influence on the Rochdale envelope for commercial fisheries**

| Design feature                | Design options                                                                                                                                                                                                                                                                                                                             |
|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Wind Farm Site Layouts        | The layout E is assessed as the worst case due to having the maximum number of turbines (175) and 2 sub-stations laid out in a hexagonal pattern over the largest area.                                                                                                                                                                    |
| Wind Turbines                 | The maximum number of turbines (175) will result in smaller spacings between turbines, reducing potential for trawling between them- see above, and higher numbers of smaller turbines presents a worst case in terms of fish ecology.                                                                                                     |
| Foundations                   | Foundations which take up greatest area of seabed will reduce fishing opportunities within the site. Foundation selection will influence source noise levels and potential behavioural effects on target species as well as the relative risks of fishing gear interactions.                                                               |
| Cables                        | Routing of cables through black bream spawning area will be the worst case, but should be mitigated by routing outside of breeding season if routing through spawning area is unavoidable. Cables should be buried and over-trawlable. Worst case is requirement for rock armour and mattresses where full cable burial is not achievable. |
| Construction and Installation | The longest potential construction period results in the largest temporal effect.                                                                                                                                                                                                                                                          |
| Decommissioning               | Assumed as installation.                                                                                                                                                                                                                                                                                                                   |

- 18.5.6 The scale of potential impacts is related to the size and character of the potential receiving environment. It is therefore possible that often unpredictable factors, unrelated to the project site, could cause changes in the commercial fisheries baseline over the life of the project.
- 18.5.7 Due to MMO restrictions upon the release of specific fisheries data, it has not been possible to undertake impact assessment on an individual vessel basis. The data that are available do however specify gear type, species landed and landing ports and the following assessment is by fishery/method. It should however be recognized that certain of the local vessels practice a number of fishing methods targeting a variety of species at different times of the year. A number of local vessels could potentially therefore be subjected to combinations of the specific impacts assessed below.

### Construction

Complete loss or restricted access to traditional fishing grounds

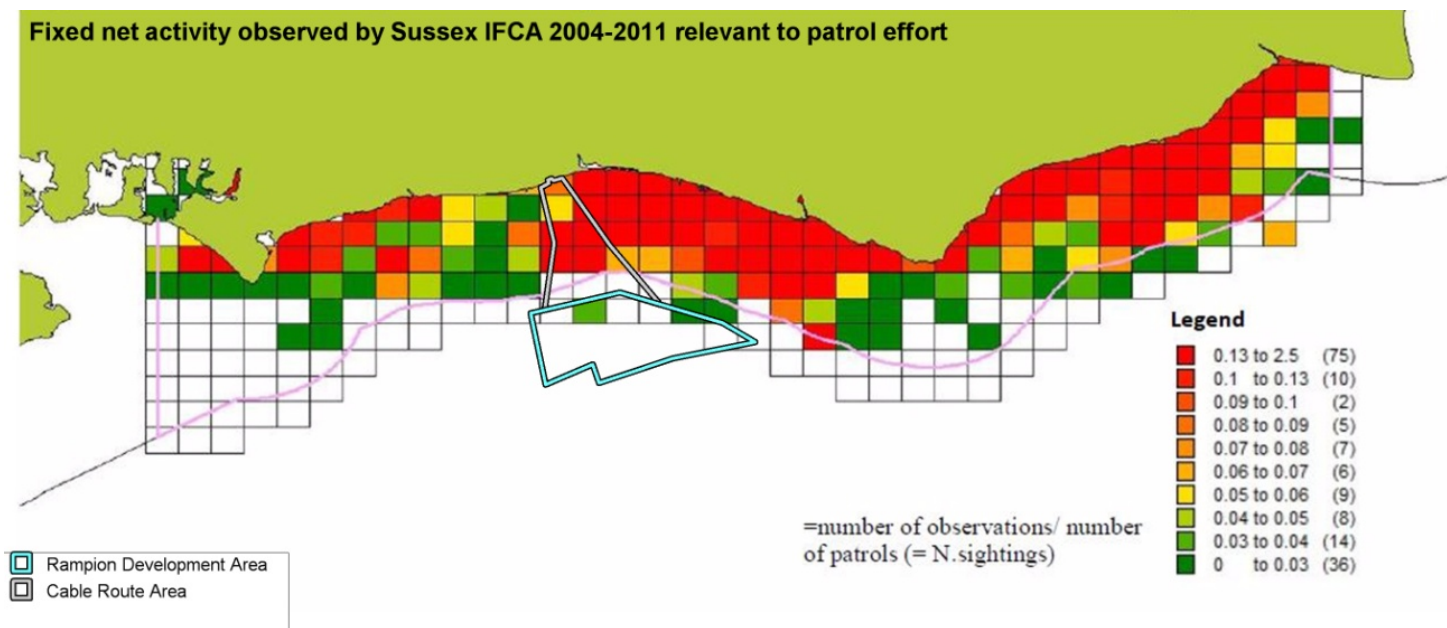
- 18.5.8 As summarised above and described in detail in Appendix 18.1 fishing activity in the vicinity of the project and its export cable is predominantly carried out by local Sussex vessels with Shoreham and Newhaven the principal landing ports.
- 18.5.9 The principal effect of the construction phase will be the temporary restriction of access to fishing grounds as a result of the imposition of transitory safety zones around construction activities and the presence of partially installed infrastructure. In line with standard offshore practice, safety zones of 500m radius are likely to be implemented around construction activities, from which all non-construction associated vessels would be excluded. The worst case scenario would be construction and commissioning spread across the whole site during this phase leading to exclusion of fishing activity from the entire Offshore Project site. It is however unlikely that this will occur for the duration of the construction phase.
- 18.5.10 Inter-array and export cables are to be buried where feasible and protected by other means if burial is not possible. It is considered that fishing vessels will not be able to safely fish in the vicinity of the cables until such measures are completed and their “over-fishable” status confirmed by post-installation surveys. This would therefore result in loss of fishing grounds along the export cable route during the construction phase (exact routes have not yet been established, but it is expected that routes from both substations will be aligned close to the wind farm and will be laid close together from there into the landfall area. The whole width of the cable route corridor as shown in Figure 18.1 will not be an exclusion zone).
- 18.5.11 *UK fixed net fishery in relation to the project site:* The vessels undertaking fixed netting, whilst limited in range by their size, have a degree of versatility due to their ability to undertake a number of fishing methods and target a variety of species. Their sensitivity is therefore assigned as **medium**. The fixed netting

grounds targeted by the local fleet extend over an area from Bognor Regis in the west to Dungeness in the east and offshore beyond the 12Nm limit as illustrated in Figure 18.11 which was derived from information provided by fishermen. The grounds located within the Project site therefore represent a relatively small percentage of the total fishing grounds. The findings of the Sussex IFCA study (Figure 18.10) whilst confined to data within the 6 Nm limit, also suggest that fixed netting activity is concentrated within the 6 Nm limit inshore of the ROWF site. The concentration of fixed netting activity within the 6 Nm limit may be partly a function of there being less potential for nets being damaged by towed gear methods as a consequence of the various restrictions within the 6 mile limit on trawling and scallop dredging.

18.5.12 In ICES rectangle 30E9, within which the ROWF is located, static gillnets represent 16.6% of the total average landings values (2001 to 2010) and the sensitivity is assessed as medium. Due to the proportion of traditional fishing grounds occupied by the Offshore Project and the short period of exclusion, the magnitude of the impact on the fixed net fishery is considered to be small. The loss or restricted access to traditional grounds during the wind farm construction phase is therefore expected to result in a minor impact.

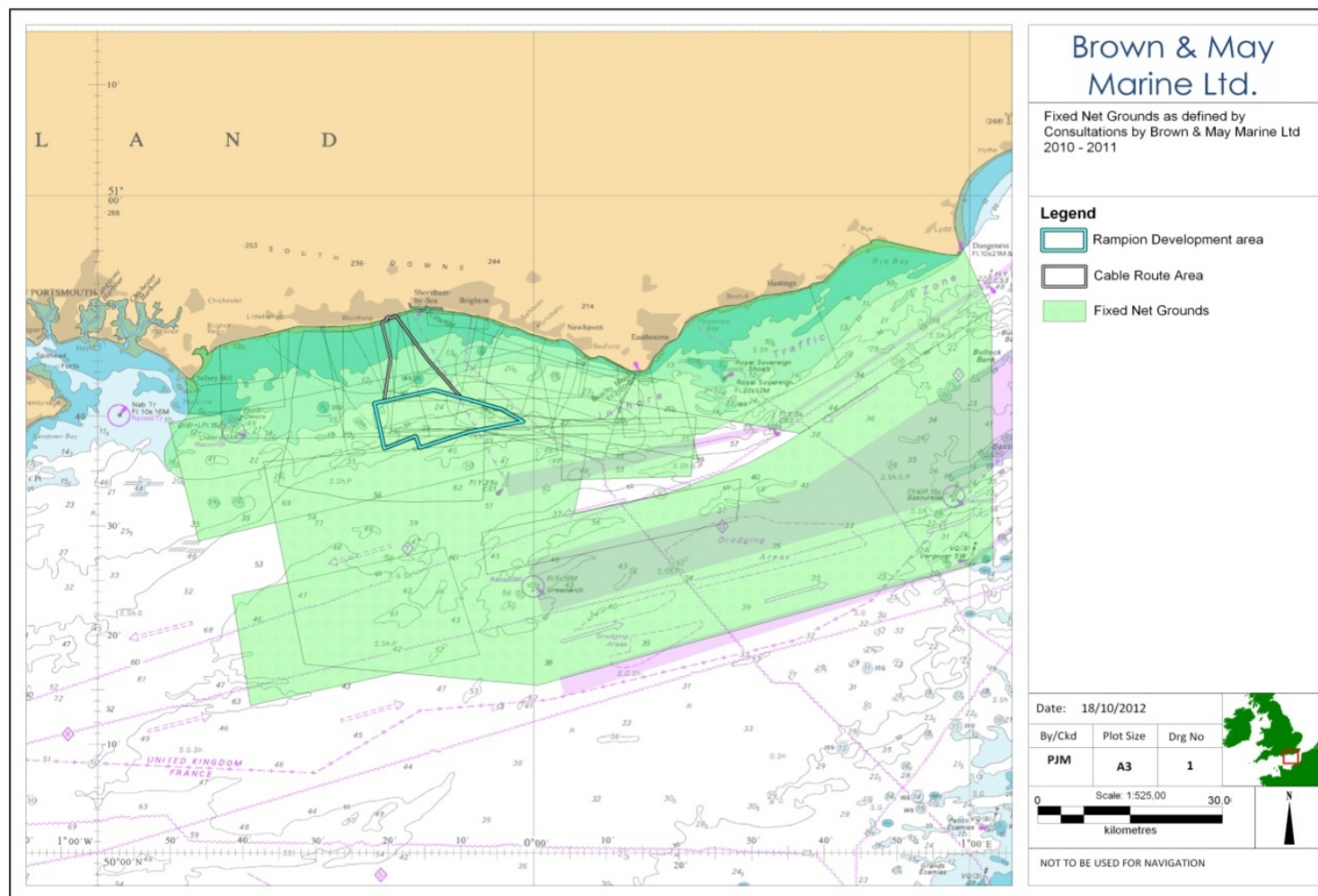
18.5.13 *UK fixed net fishery in relation to the cable route corridor:* The sensitivity of the fishery is as described above. Cable installation activities will occupy a smaller proportion of the total fishing area than installation of the wind farm itself and the period of exclusion will be shorter. The magnitude of the effect will, therefore, at worst be **small**, giving a **minor** impact

18.5.14 *UK driftnet fishery in relation to the project site:* The sensitivity of vessels engaged in drift netting is considered to be the same as the sensitivity of vessels undertaking fixed netting, namely **medium**. Drift netting grounds targeted by the local fleet, as described by the fishermen consulted; extend from Bognor Regis in the west to Hastings in the east and offshore to the 12Nm limit (Figure 18.12). Figure 18.13 provided by Sussex IFCA however, suggests low levels of isolated close inshore drift netting activity. Drift netting also accounts for only 1.4% of the total average landings values (2001 to 2010) in ICES rectangle 30E9. The magnitude of the effect is therefore assigned at worst as **small** giving a **minor** impact, whilst accepting that with the absence of a history of drift netting further offshore within the vicinity of the Project site, the impact could in fact be **negligible**.



**Figure 18.10: Fixed netting activity observed by SIFCA between 2004 and 2011 (Source: SIFCA, 2012)**





**Figure 18.11: Principal fixed net grounds as defined through consultation 2010-2011 (Source: BMM)**

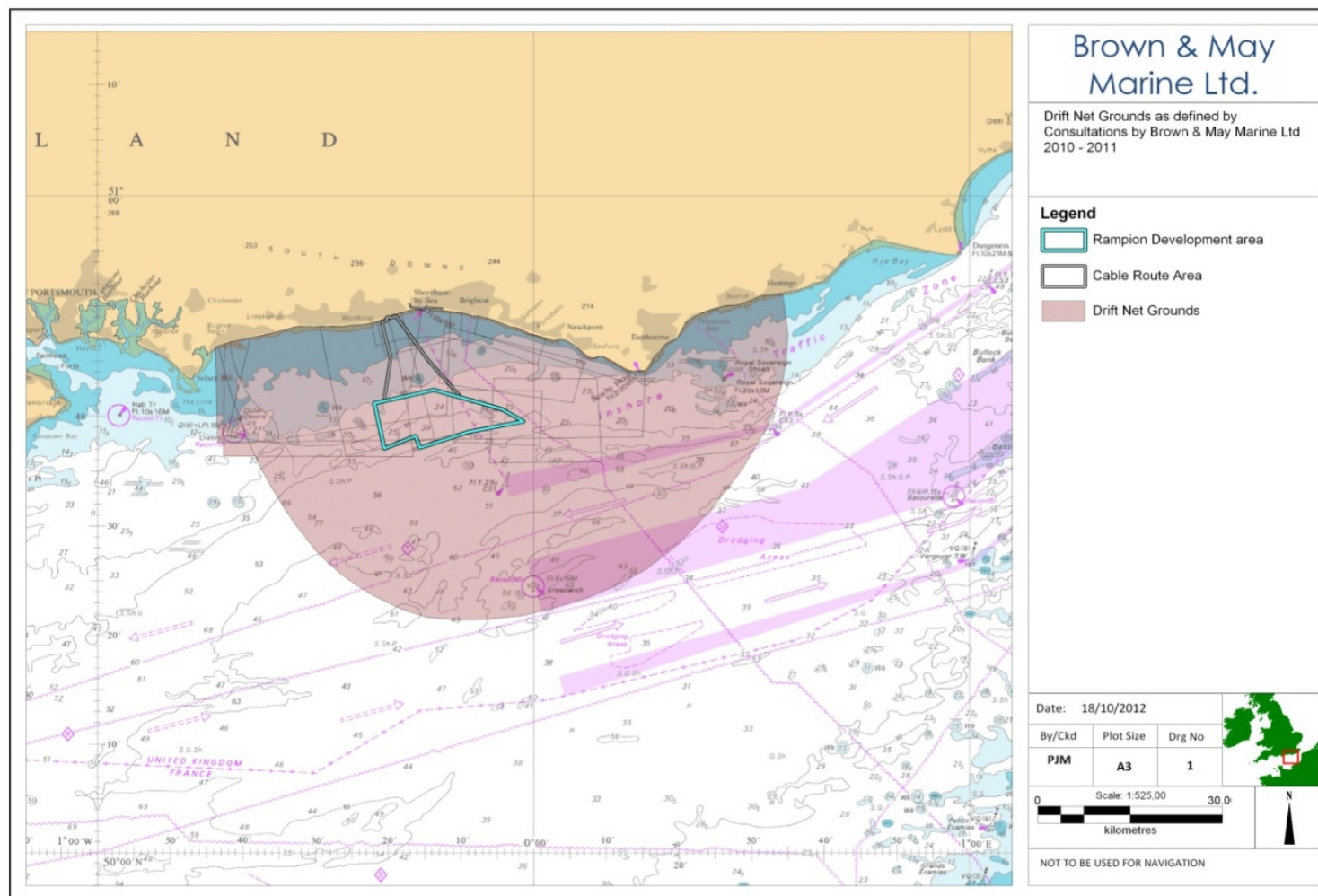
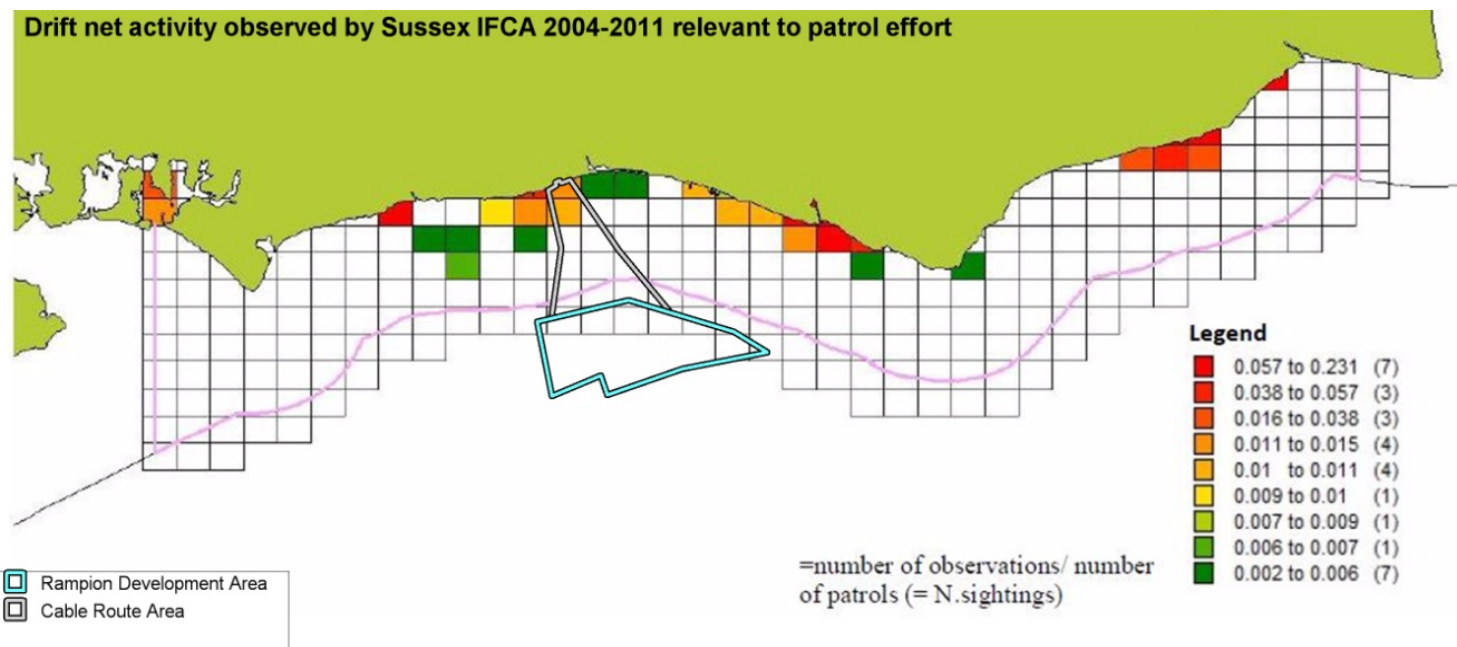


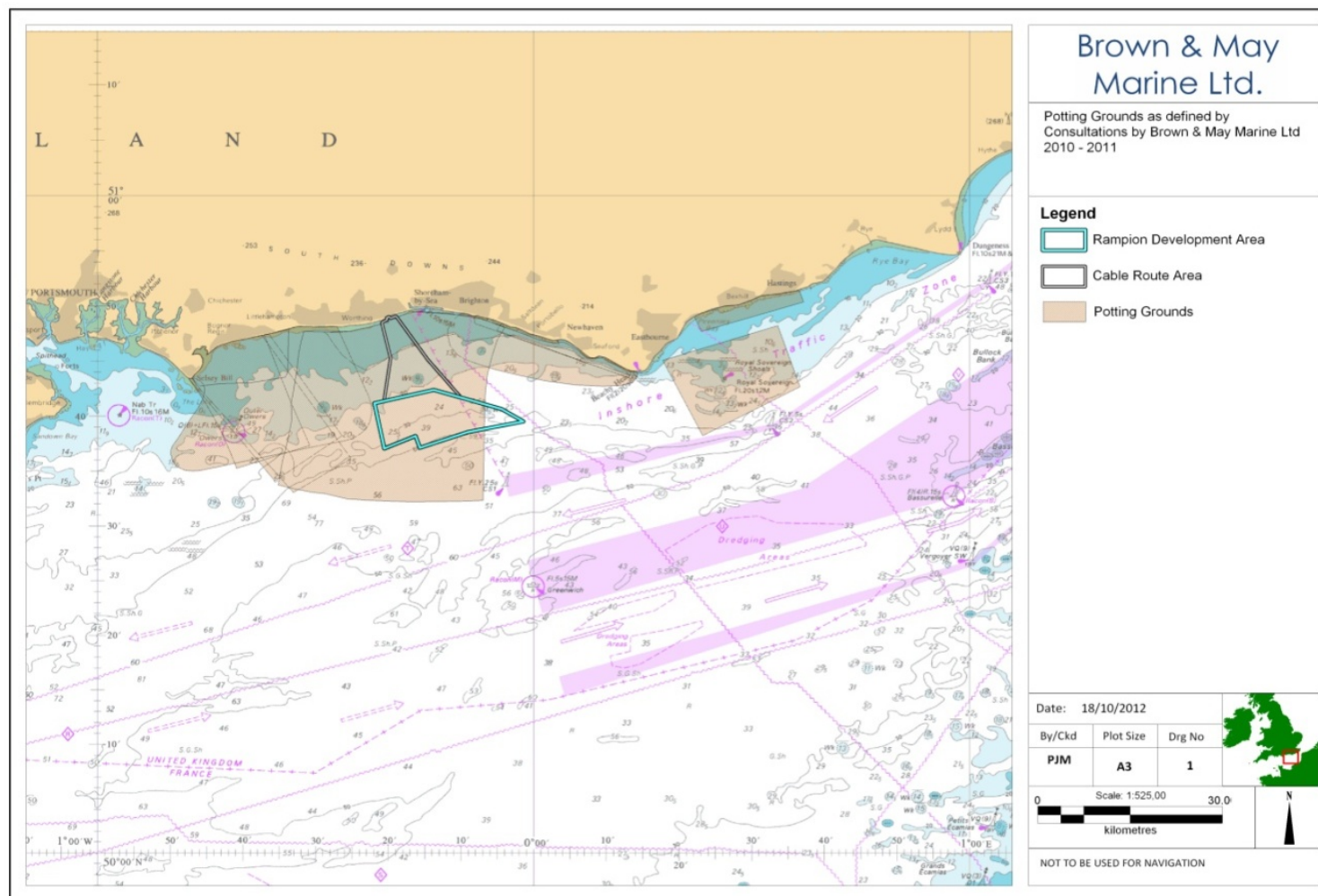
Figure 18.12: Principal drift net fishing grounds as defined through consultation 2010-2011 (Source: BMM)



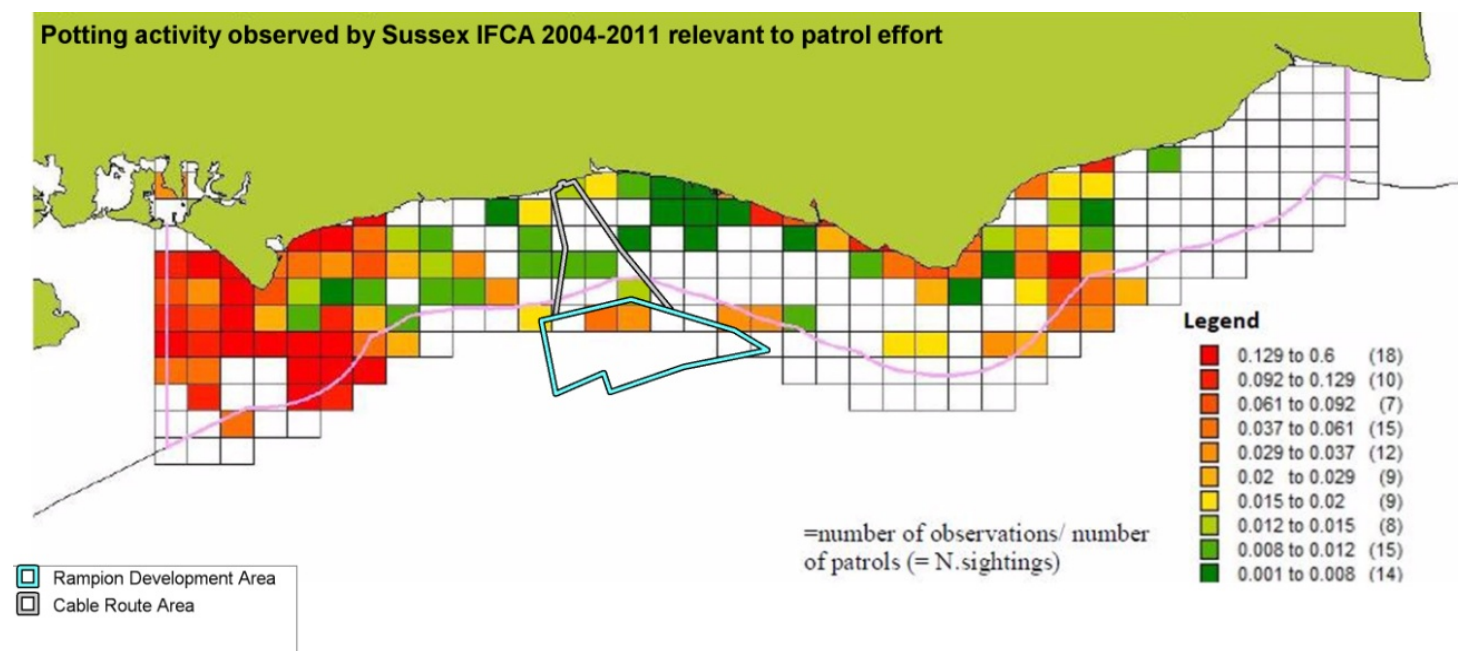
**Figure 18.13: Drift netting activity observed by SIFCA between 2004 and 2011 (Source: SIFCA, 2012)**



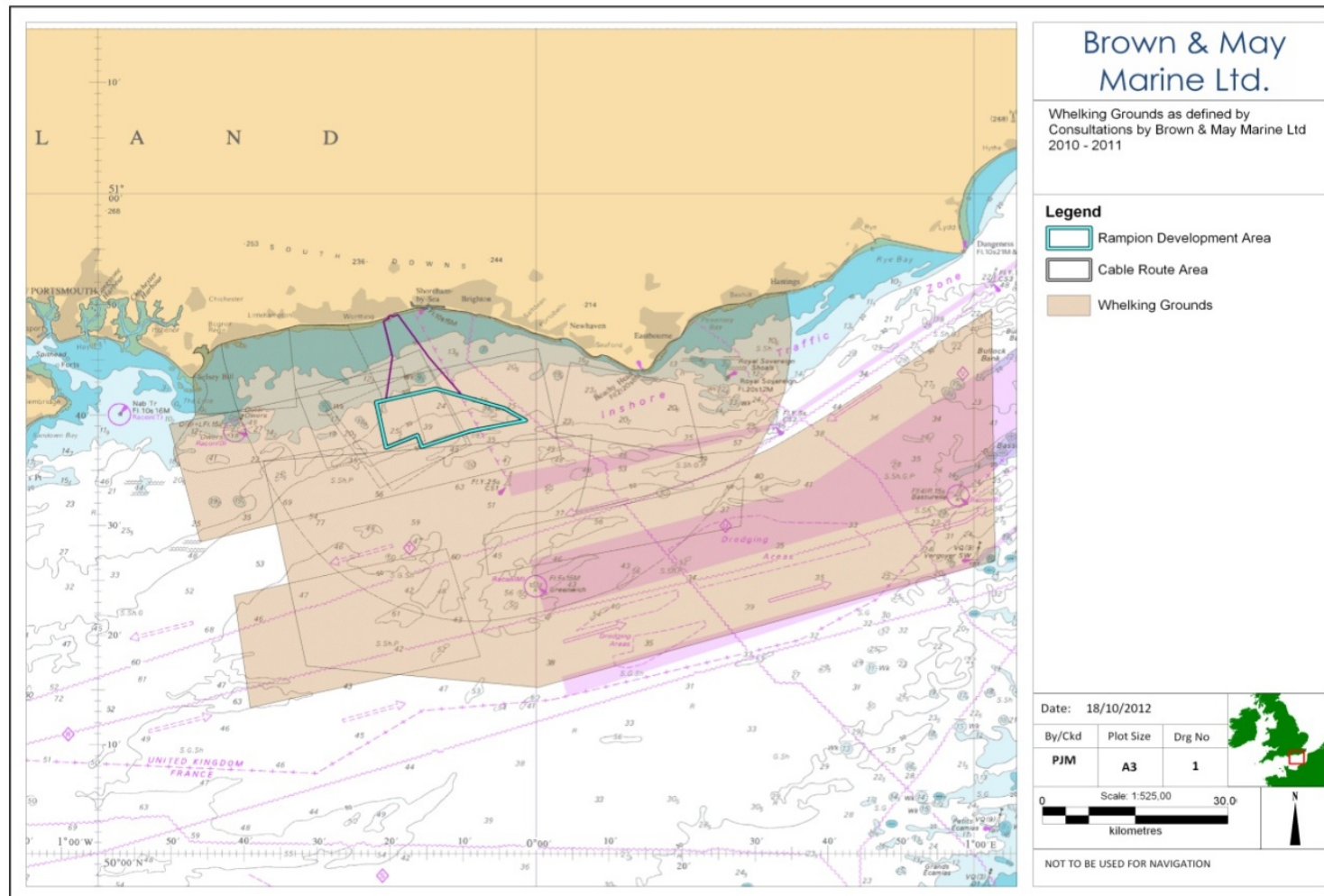
- 18.5.15 *UK driftnet fishery in relation to the cable route corridor:* With regards to the magnitude of the effect associated with the export cable installation, the area of exclusion will be smaller than that associated with the construction of the wind farm. The period of exclusion will also be shorter. The magnitude of the effect will therefore be at worst **small**, giving a **minor** impact.
- 18.5.16 *UK pot and trap fishery in relation to the project site:* Potting and trapping represent 31.0% of the landings values in rectangle 30E9. The larger vessels, which at certain times of the year undertake potting and cuttlefish trapping, have wider operational ranges and the ability to practice a number fishing methods. The smaller local vessels are however limited both in their operational range and method versatility. The sensitivity of the vessels engaging in these fisheries therefore varies from **medium** to **high**.
- 18.5.17 Figure 18.14, Figure 18.16 and Figure 18.18 illustrate the extents of the crab and lobster, whelk and cuttlefish potting and trapping grounds. As discussed in the Baseline Assessment however, the majority of the crab and lobster potting and all of the cuttlefish trapping activity occurs inshore of the project site. This is further supported by the charts prepared by the Sussex IFCA (Figure 18.15, Figure 18.17 and Figure 18.19). In the case of these fisheries, the magnitude of the effect will therefore be **small**. In the case of the whelk fishery, whilst this activity extends further offshore, the grounds are extensive, with the project site representing only a small proportion of the total fishing area and as such the magnitude will also be **small**.
- 18.5.18 Taking the above considerations, the impact on the smaller vessels engaging in potting and trapping will be **moderate**. In the case of the whelk fishery, the impact is expected to be **minor**.



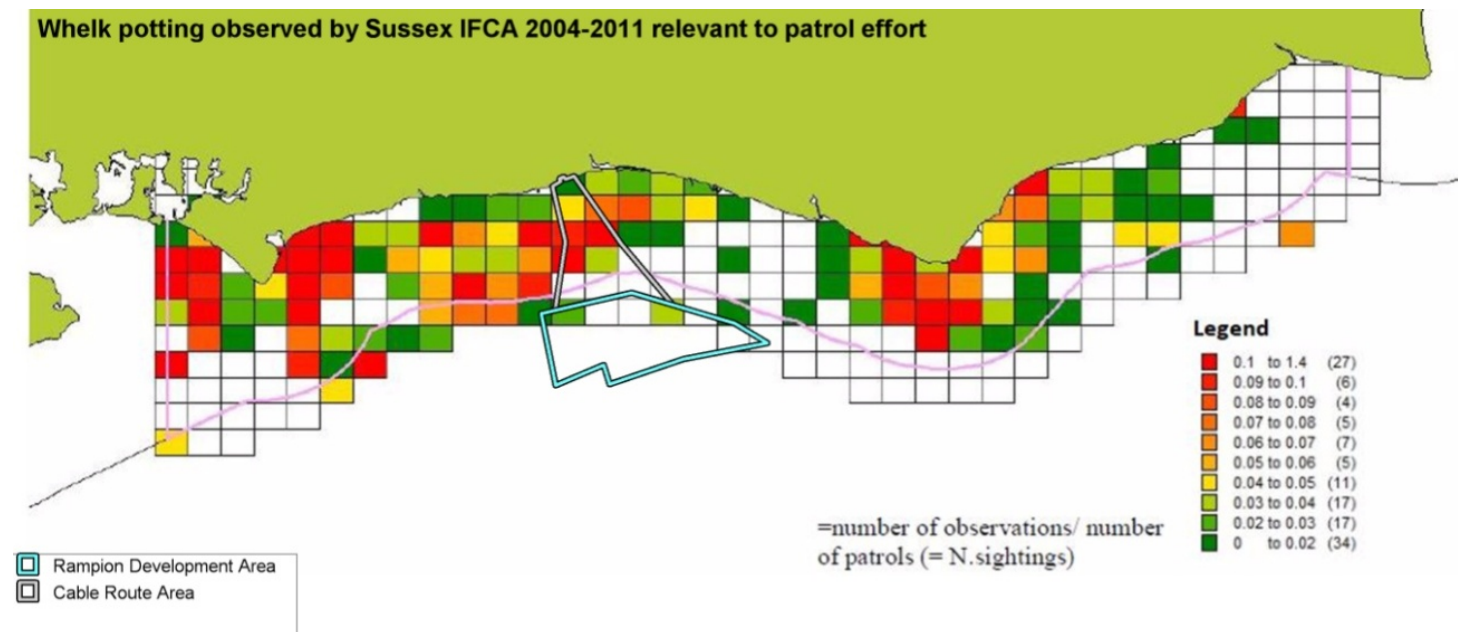
**Figure 18.14: Crab and lobster potting grounds as defined from consultation 2010-2011 (Source: BMM)**



**Figure 18.15: Potting activity observed by SIFCA between 2004 and 2010 (Source: SIFCA, 2012)**

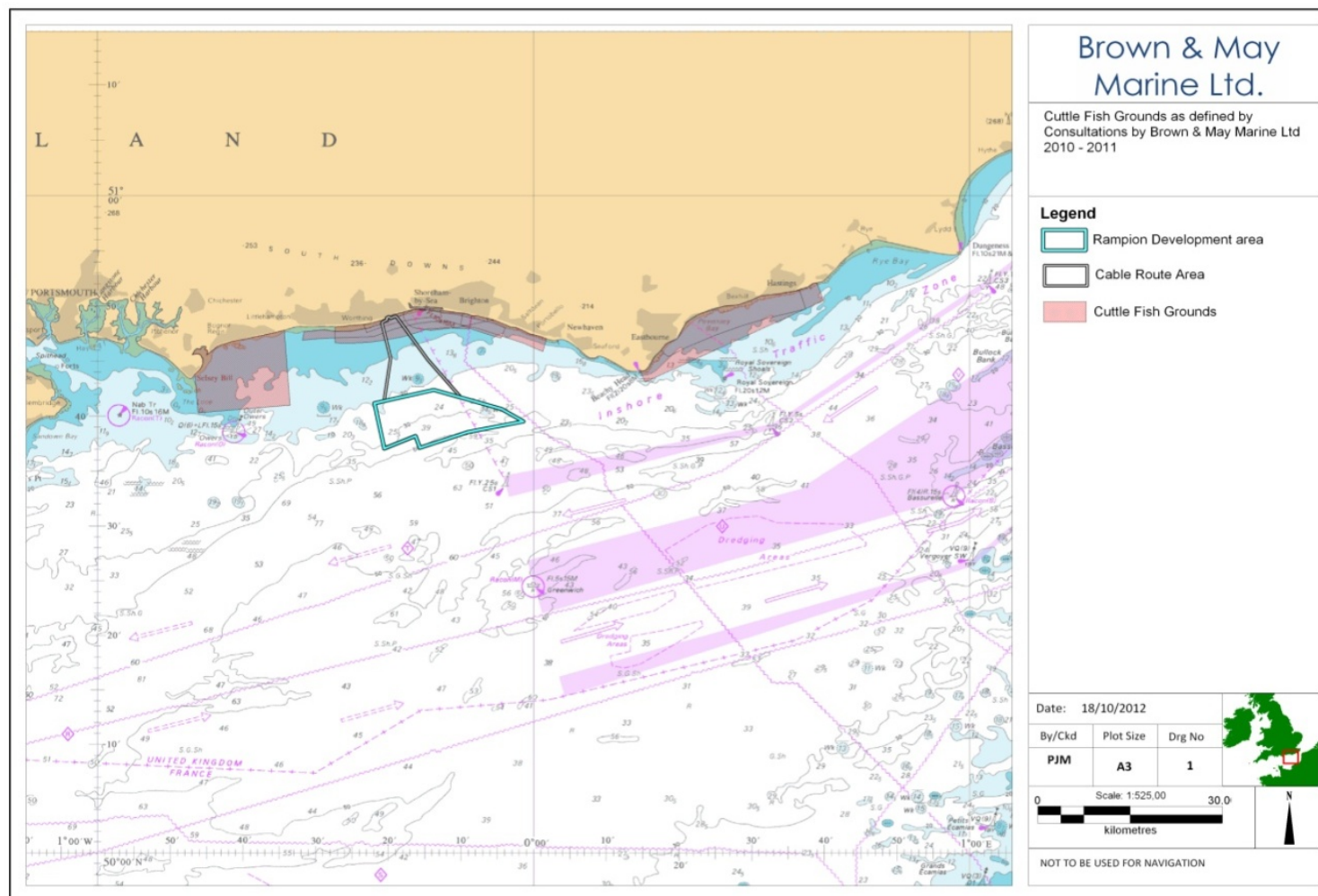


**Figure 18.16: Whelk fishing grounds as defined from consultation 2010-2011 (Source: BMM)**

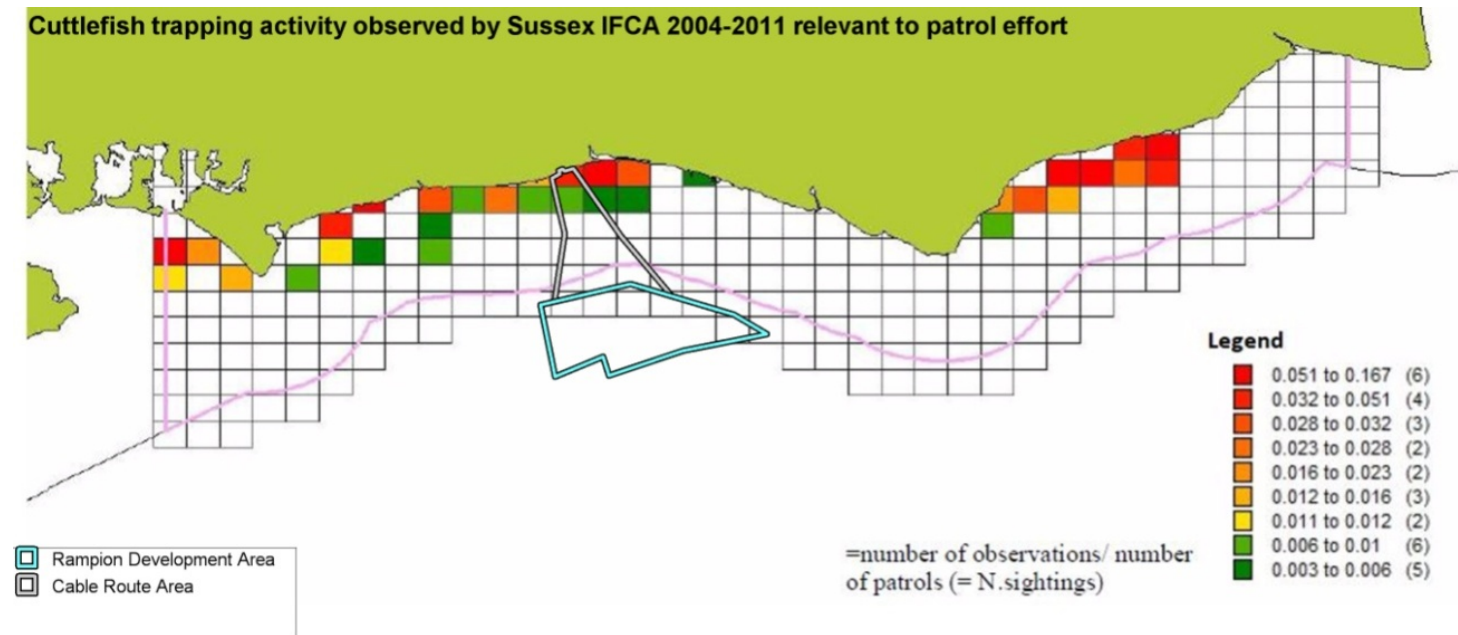


**Figure 18.17: Whelk potting activity observed by Sussex IFCA between 2004 and 2011 (Source; SIFCA, 2012)**





**Figure 18.18: Cuttlefish trapping grounds as defined from consultation 2010-2011 (Source: BMM)**



**Figure 18.19: Cuttlefish trapping activity observed by Sussex IFCA between 2004 and 2011 (Source: SIFCA, 2012)**

- 18.5.19 *UK pot and trap fishery in relation to the cable route corridor:* As described in the Baseline assessment, export cable installation activities will pass through potting and cuttlefish trapping grounds. In terms of the actual proportional area of exclusion and the duration of exclusion, the magnitude of the effect will vary between vessels from **negligible** to **small**, resulting in potentially **minor** to **moderate** impacts.
- 18.5.20 *UK hook and line fishery:* Due to mobile species targeted and the ability to fish alternative areas, the sensitivity of the hook and line fishery is considered to be **low**. Taking the very small gear deployment areas involved and the mobility of the target species, the magnitude of the effects of both the construction of the wind farm and installation of the export cables will be **small**. The resultant impact is therefore predicted to be **minor**.
- 18.5.21 *UK demersal otter trawl fishery in relation to the project site:* As discussed in the Baseline Assessment, the local vessels which engage in demersal otter trawling also practice other fishing methods such as scallop dredging and pair trawling. These vessels, by virtue of their size and accommodation facilities have the potential to operate over a wider area than their potting and netting counterparts. From consultation it is however understood that the majority of the activity by the under 15m vessels is focused on the grounds shown in Figure 18.14. The sensitivity of these vessels is therefore assigned as **medium**.
- 18.5.22 Demersal otter trawling represents 8.1% of the total average landings values (2001 to 2010) in ICES rectangle 30E9 with inshore fishing grounds of local vessels extending from Bognor Regis in the west to Eastbourne in the east with further grounds extending beyond the 12Nm limit and encompassing the project site (Figure 18.20). Taking the landing values recorded in rectangle 30E9, and the proportional area and duration of exclusion, the magnitude of the effect is expected to be **small**, giving a **minor** impact on the demersal otter trawling fishery.
- 18.5.23 *UK demersal otter trawl fishery in relation to the cable route corridor:* As for the other methods discussed, in both spatial and temporal contexts, the magnitude of the cable installation exclusion effect will be **small**. Taking the same sensitivity considerations as for the project area, the impact of the export cable installation on demersal otter trawling is expected to be **minor**.
- 18.5.24 *UK pair trawl fishery in relation to the project site:* The sensitivity of the vessels undertaking pair trawling, being the same local trawlers which practice demersal otter trawling in the region, is therefore **medium** (as above). Pair trawling in the project vicinity (Figure 18.21) is a short seasonal fishery, exploiting local migration patterns of black bream and bass and accounts for an average of 4.7% of the landing values from ICES rectangle 30E9. Taking the migratory patterns of the target species, the value of the fishery and the spatial and temporal contexts, the effect is assigned a **small** magnitude giving a **minor** impact for the fishery, but recognising that for a small number of local vessels the impact may be **moderate**.



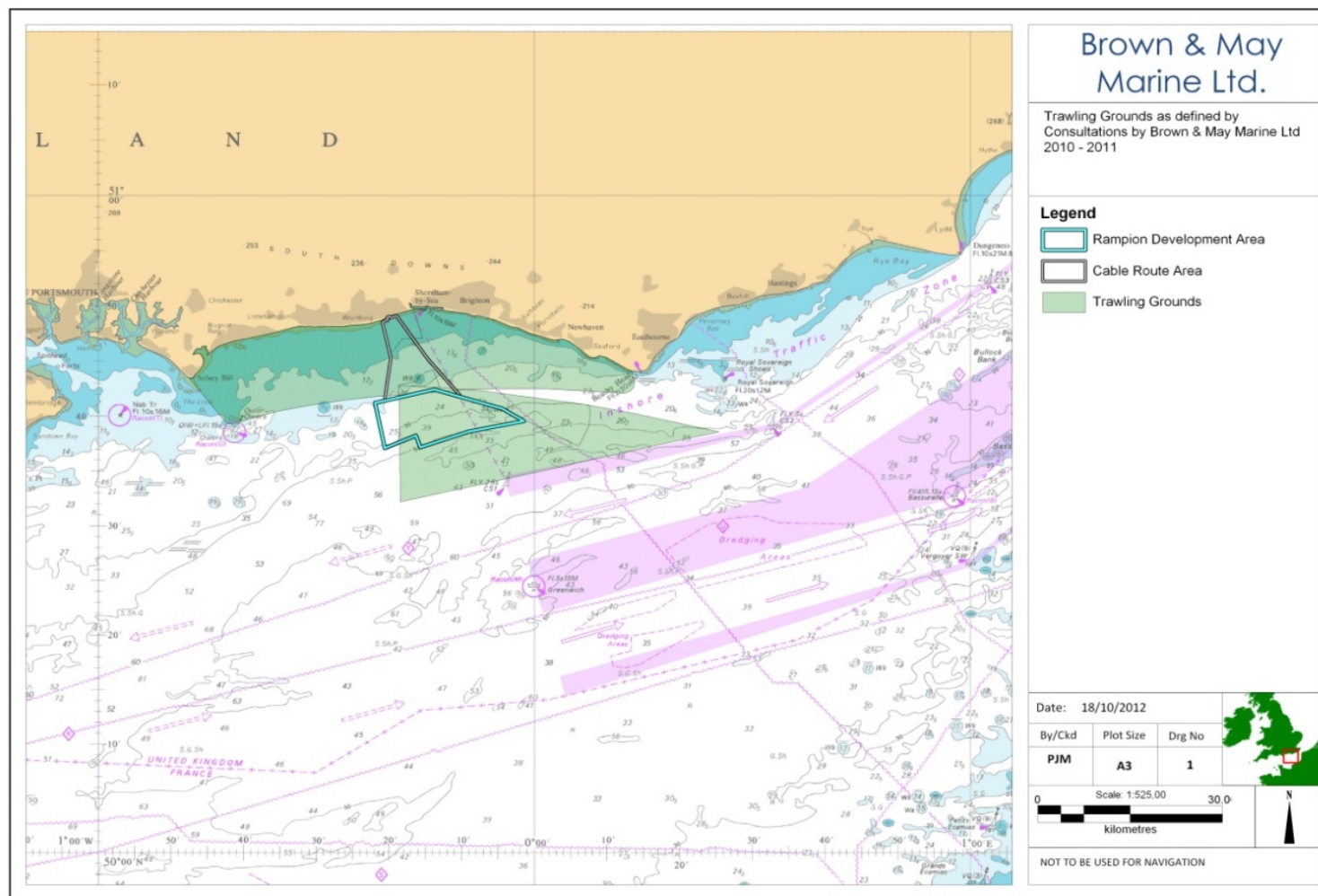
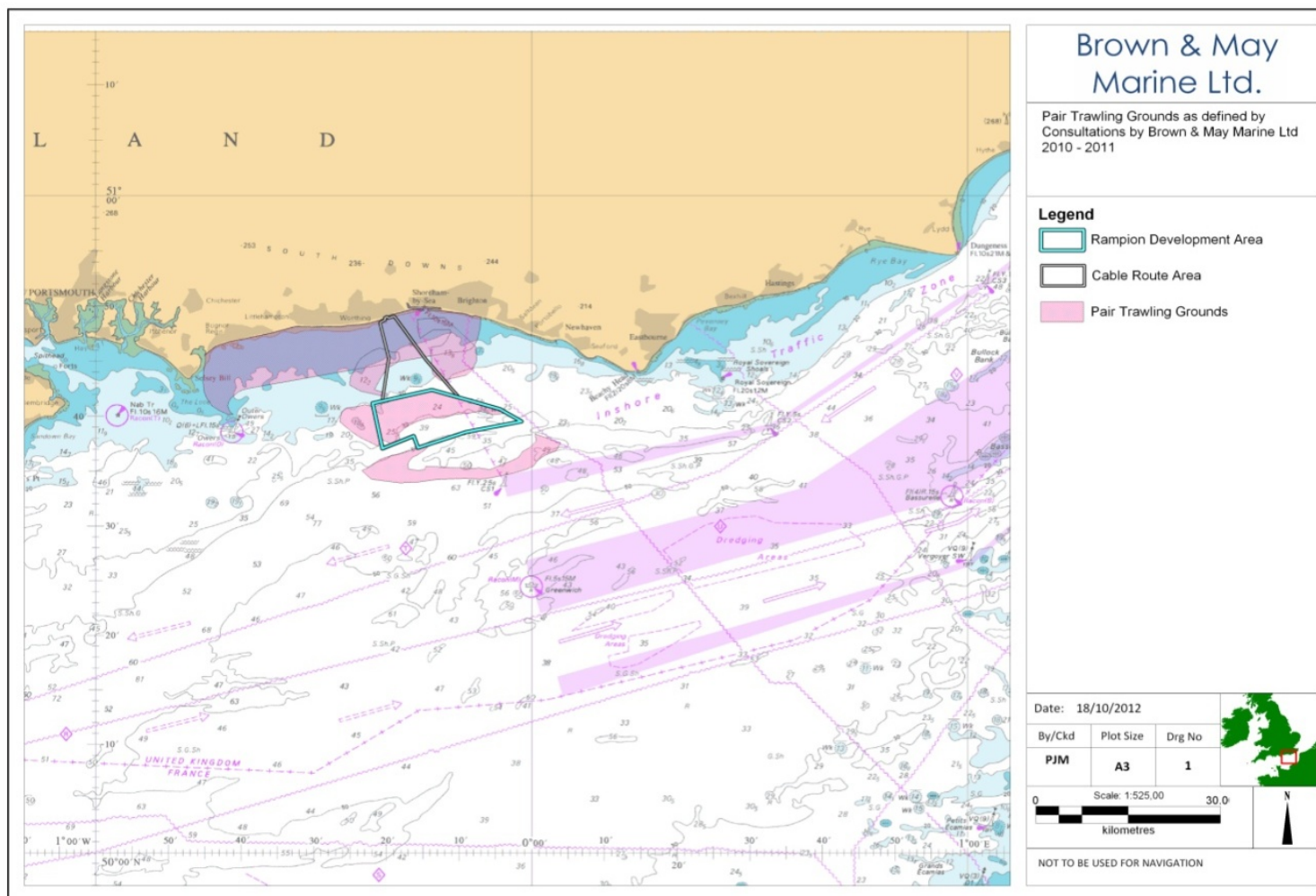
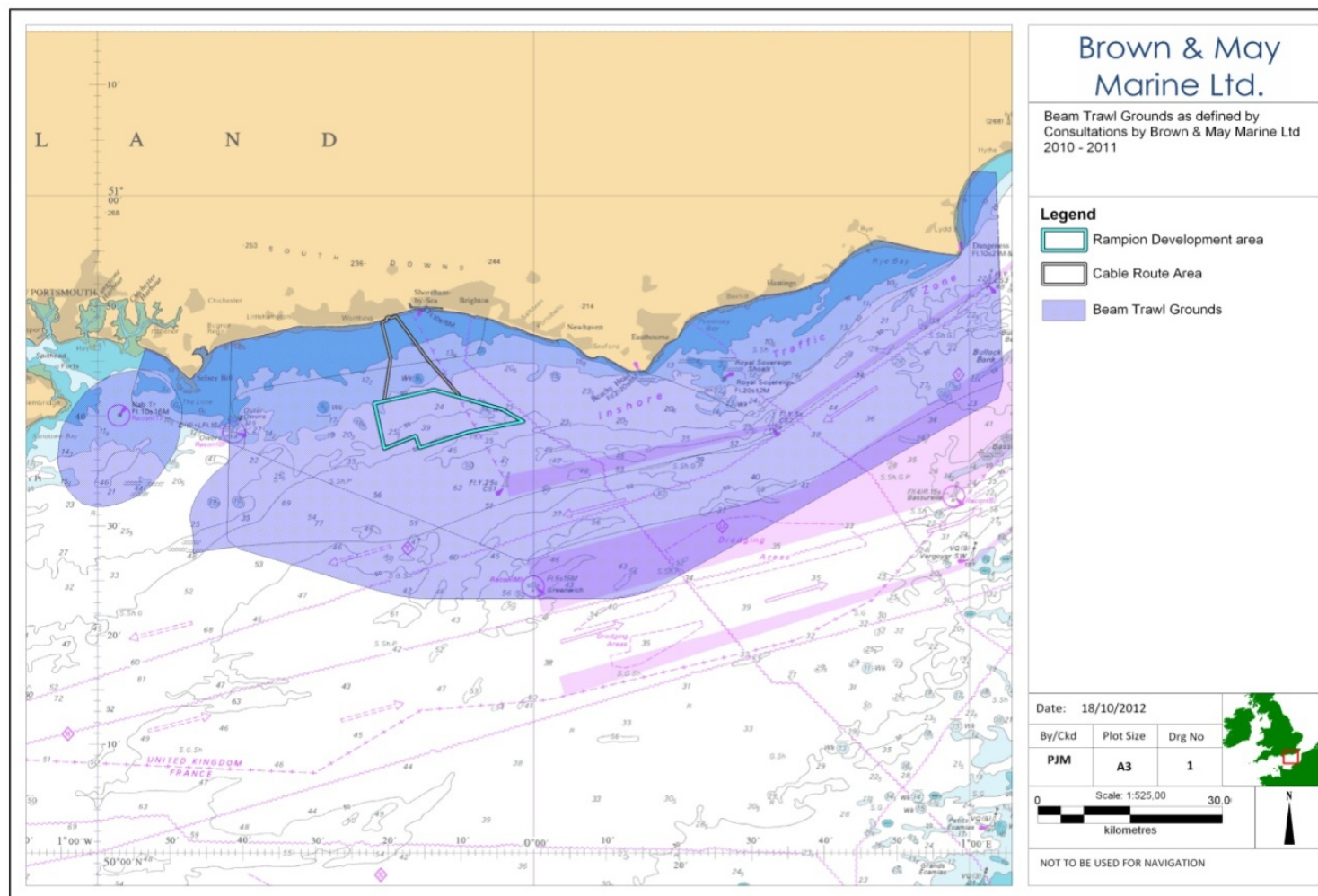


Figure 18.20: Otter trawling fishing grounds as defined through consultation 2010-2011 (Source: BMM)



**Figure 18.21: Pair trawling fishing grounds as defined through consultation 2010-2011 (Source: BMM)**

- 18.5.25 *UK pair trawl fishery in relation to the cable route corridor:* In view of the very small proportional area of short term exclusion during export cable installation activities, the magnitude of the effect, which will only occur if installation activities coincide with the short seasonal fishery, is assessed as at worst **small**, giving a **minor** impact.
- 18.5.26 *UK beam trawl fishery in relation to the project site:* The operational areas of the larger class of beam trawlers are extensive. For example UK beam trawlers based at ports such as Brixham and Newlyn will on occasion fish areas of the Western Approaches, Channel, Irish Sea and North Sea. As previously stated, the majority of the local vessels are multi-purpose and those undertaking beam trawling will also engage in other methods on a seasonal basis. The sensitivity of the receptors is therefore **low**.
- 18.5.27 Beam trawling represents 14.7% of the total average landings values (2001 to 2010) in ICES rectangle 30E9. The beam trawl grounds targeted by the local fleet, cover a comparatively large area, from Portsmouth in the west to Hythe in the east and beyond the 12Nm limit (Figure 18.22). Due to engine and beam width restrictions with the 12Nm limit, beam trawling within the vicinity of the project is for the most part by a limited number of the smaller class of under 15m vessels based at Shoreham and Newhaven.
- 18.5.28 As illustrated by Figure 18.22, the grounds located within the project site represent a low percentage of the total grounds available to the fishery and the magnitude of the effect is assessed as **small**, giving a **minor** impact.
- 18.5.29 *UK beam trawl fishery in relation to the cable route corridor:* In the case of the installation of the export cable installation, due to the proportionally smaller area involved and shorter duration of activities where localised temporary exclusion will occur, the potential impact is not expected to exceed **minor** and may well be **negligible**.
- 18.5.30 *UK local scallop dredge fishery:* The local vessels undertaking scallop dredging are for the most part the same multi-purpose vessels as engaging in the beam trawling and otter trawling fisheries assessed above. The receptor sensitivity is therefore again assigned as **low**.
- 18.5.31 For both the project site and the cable route corridor, scallop grounds of the local vessels are understood to extend from Chichester Harbour in the west to Hythe in the east and well beyond the 12Nm limit (Figure 18.23). Within the immediate vicinity of the project site, is a ground known as the “9 miler” (Figure 18.24), a part of which extends into the project site.
- 18.5.32 As the fishing grounds within the Offshore Project site constitute only a small proportion of the total grounds available to local vessels, the magnitude of the effect is expected to be **small** resulting in a **minor** impact.



**Figure 18.22: Beam trawl fishing ground as defined through consultation 2010-2011 (Source: BMM)**



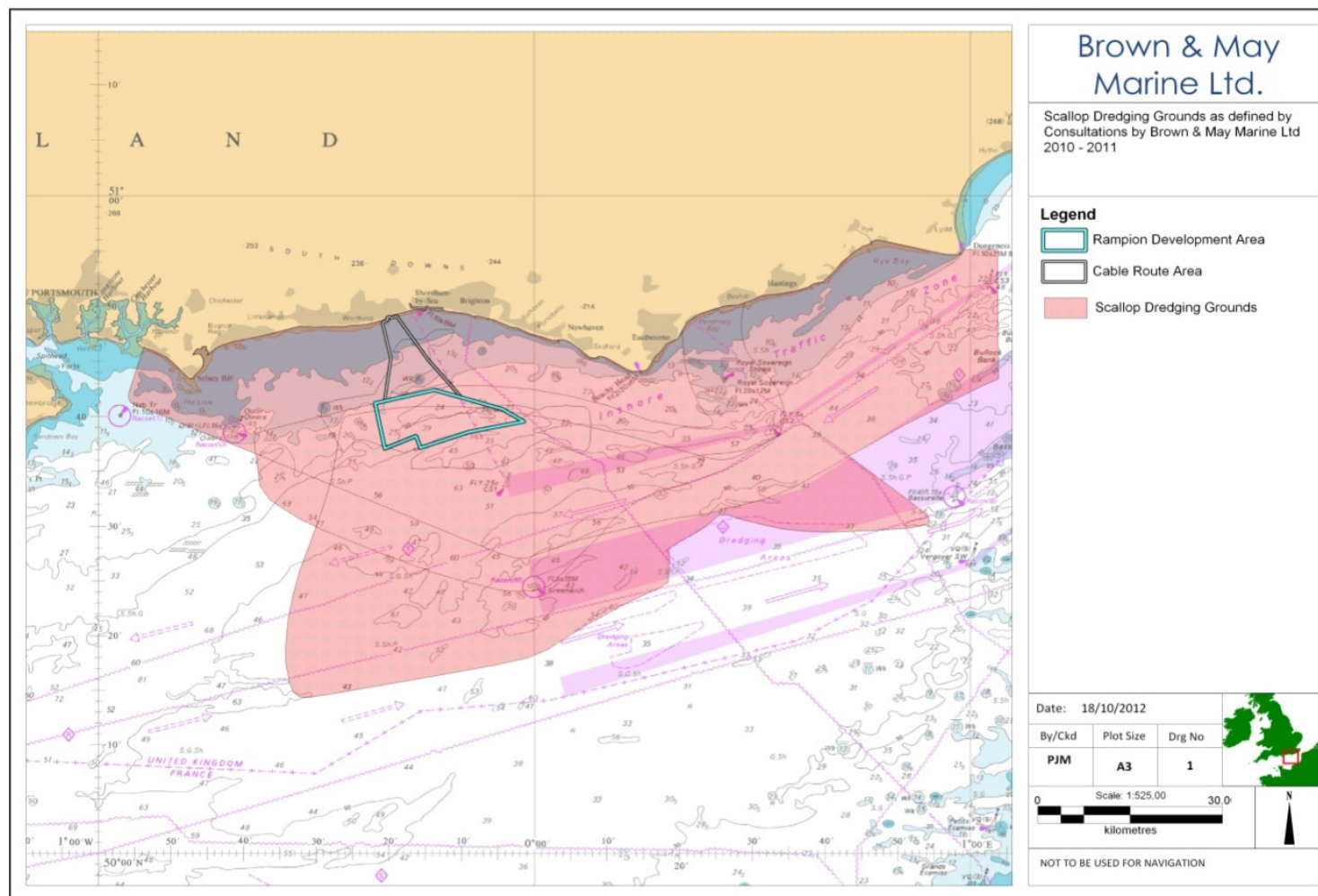
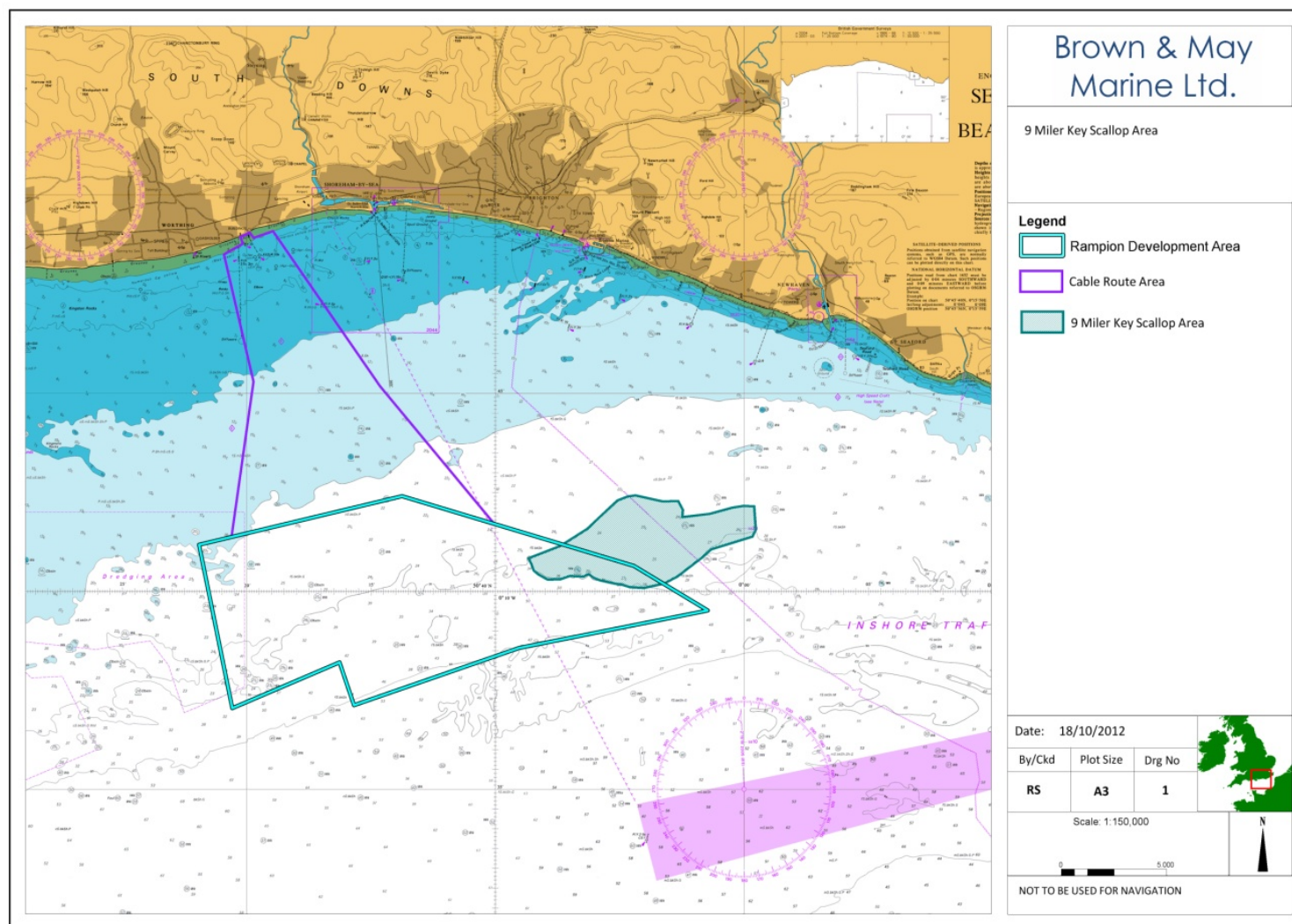


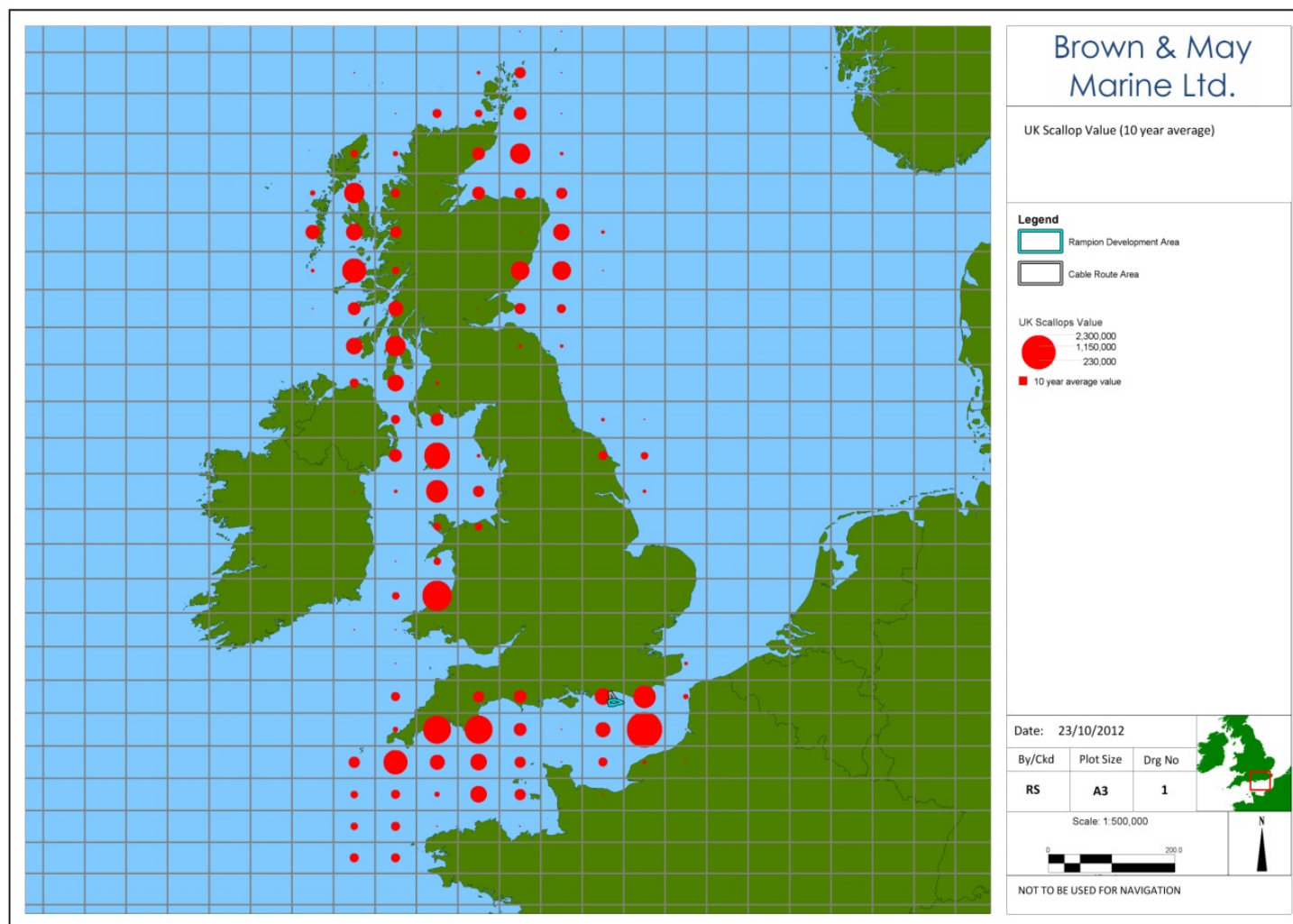
Figure 18.23: Local scallop dredging grounds as defined through consultation 2010-2011 (Source; BMM)



**Figure 18.24: Location of the “9-Miler” scallop dredging ground (Source: Leech Fishing Ltd, 2012)**

- 18.5.33 *UK nomadic scallop dredge fishery*: The larger nomadic scallop dredging vessels target extensive grounds around the UK, including those in the vicinity of the project site (Figure 18.25). These vessels, whilst having little multi-purpose capacity, have extensive fishing opportunities and therefore have **low** sensitivity.
- 18.5.34 The areas within the project site and the export cable area constitute only a very small percentage of the total grounds available. The pattern of the nomadic fleet is for an area found to contain scallops to be intensively fished by a large number of vessels until catch rates become no longer viable, after which it is left until if and when stock recover to viable levels, which if it occurs can take up to 5 years.
- 18.5.35 Under restrictions placed on the number of dredges per side which can be operated within 12Nm under the Scallop Order 2012, large nomadic scallop dredge vessels are unlikely to target grounds in the vicinity of the Offshore Project site or cable route. Taking this and the proportion of the total grounds occupied by the Offshore Project site and export cable route, the magnitude of the effect is expected to be **negligible**, giving a **negligible** impact.
- 18.5.36 *Belgian beam trawl fishery*: As with the larger UK beam trawlers, the Belgian beam trawl fleet has a high spatial adaptability due to an extensive operational area and therefore the sensitivity is **low**.
- 18.5.37 The grounds within the project site comprise only a low percentage of the total grounds available to the fleet (Figure 18.26). Furthermore, by virtue of the vessels engine capacities and length of beam trawls used, the majority of the vessels within the fleet are prohibited from operating within the 12 Nm limit. The magnitude of the effect in respect of the project site is therefore expected to be, at worst, **small**, with an impact predicted to be **minor**. As the majority of the export cable corridor is located within the 6 Nm limit, within which all Belgian fishing vessels are prohibited from operating, the impact will be **negligible**.
- 18.5.38 *French trawl fishery*: As stated in the Commercial Fisheries Baseline, Appendix 18.1, it was not possible to obtain full datasets of either French VMS data or fisheries statistics from the French authorities in order to confidently establish the extent of relevant French trawler's activity. On the basis of available information, French vessel activity within the project site represents a low percentage of the total effort (Figure 18.9). The sensitivity of the French trawl fishery within the project site will be at most **low**, due to high method versatility and the ability to fish a number of fishing grounds. Due to a small proportion of traditional fishing grounds being occupied by short term construction activities, the magnitude has been assessed as **small**. The significance of the impact of loss of fishing on French trawlers as a result of the construction of Offshore Project is therefore given as **minor**. As the majority of the export cable corridor is located within 6nm of the coast French vessels will not fish grounds within the corridor, and therefore impacts here will be of **negligible** significance.





**Figure 18.25: Scallop landings values by ICES rectangle (average (2001-2010)) (Source: MMO)**

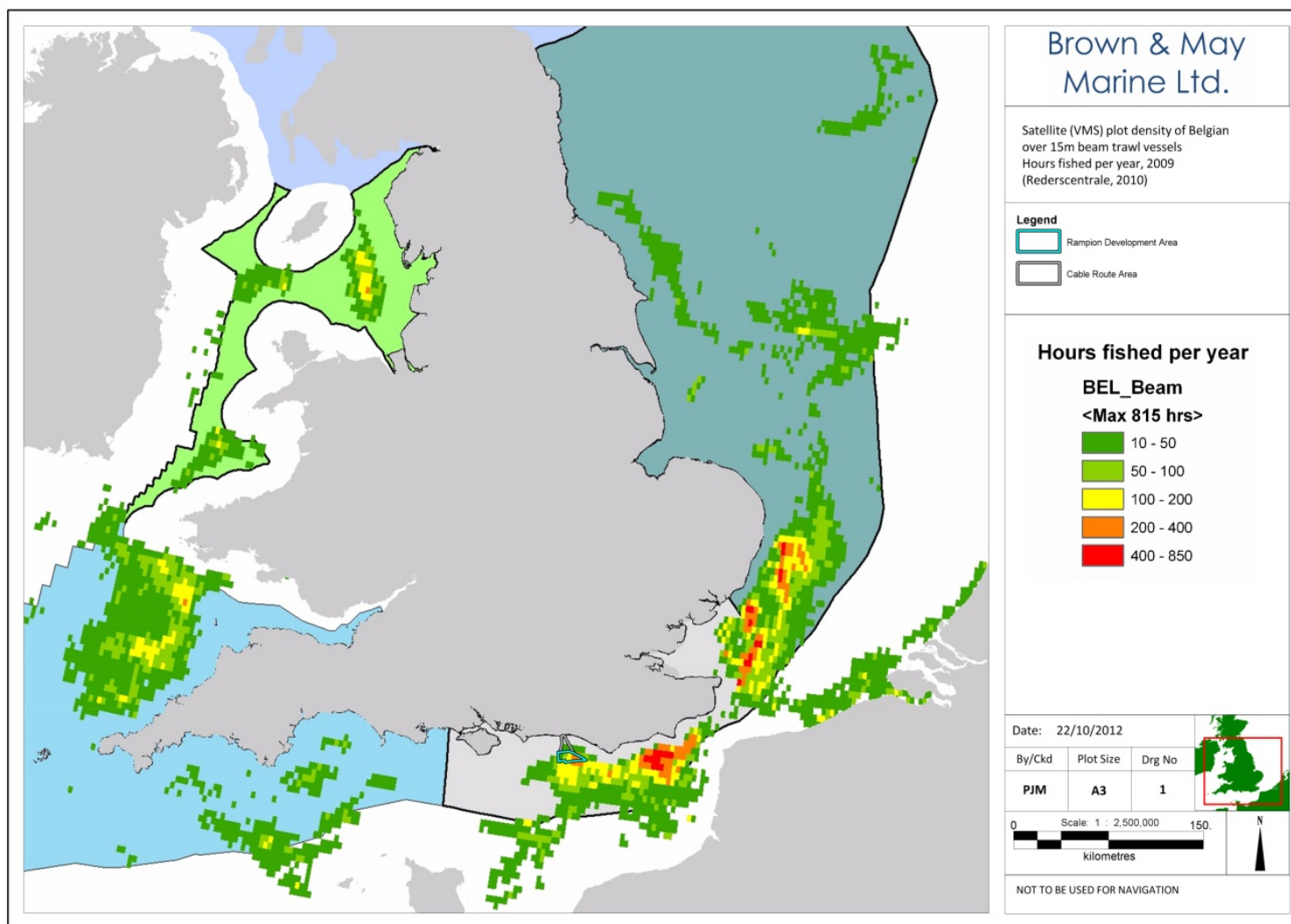


Figure 18.26: Belgian beam trawl VMS data (2009) (Source: ILVO)

### Safety issues for fishing vessels

- 18.5.39 The full assessment of fishing, and other vessel, navigation risks is provided in Section 14 - Shipping and Navigation. During construction, the incidents which could compromise fishing vessels safety include collisions with construction vessels or with part installed turbines.

### Increased steaming times to fishing grounds

- 18.5.40 The implementation of safety zones during the construction phases could theoretically result in some short term increases in steaming distances and times, and therefore higher operational costs for fishing vessels. As mentioned previously, 500m safety zones will be operational around all construction activities and 50m safety zones may be applied to partially installed infrastructure within the site. It is not the intention however for the whole project site to be closed to navigation and the areas of exclusion during the export cable installation will be short-term and very small in area.
- 18.5.41 For the purposes of this assessment, it is assumed that the sensitivity of the local receptors to increase in steaming times is the same for all categories and that the degree of impact will be purely a function of magnitude, i.e. the probability and frequency and extent of any steaming diversions which might occur.
- 18.5.42 The degree of the potential impacts on steaming times will be dependent upon the location of home ports in relation to the fishing grounds targeted and the size and duration of safety zones. The principal receptors which in theory could be impacted are the local fishing vessels from ports in close proximity to the project site such as Shoreham, Brighton and Newhaven.
- 18.5.43 *UK static gear methods (i.e. fixed nets, pots and traps) and drift netting in relation to the project site:* As discussed above and in Appendix 18.1, the majority of the fishing grounds for these fisheries are inshore of the project site. As such it is expected that there will be a **negligible** impact on steaming times.
- 18.5.44 *UK mobile gear (otter, pair and beam trawls; scallop dredges):* For the majority of these fishing activities, assuming that the vessels will be able to steam through most of the site during the construction phase, the impact on steaming times is also expected to be **negligible**. On the occasions where skipper may elect to avoid steaming through the site, there could however be a **minor** impact. In the case of export cable installation activities, due to the very small areas of avoidance required and the temporary and very short term duration of avoidance required, the impact is expected to be **negligible**.
- 18.5.45 *Non-UK vessels (French trawlers and Belgian beam trawlers):* Impacts are assessed as **negligible** as these vessels are unlikely to experience any increases in steaming times due to the wide extent and locations of their fishing grounds.

### Interference to fishing activity

- 18.5.46 While all of the above impacts relate to interference with fishing activity, an additional impact is the potential for navigational conflicts arising between fishing vessels and construction vessels transiting to and from site. This could include the fouling of static gear marker buoys, or towed gear vessels being required to alter towing direction.
- 18.5.47 In order to mitigate such risks, the required consultation and liaison will be undertaken to identify prescribed construction vessel transit routes avoiding concentrations of static gears.
- 18.5.48 Transiting construction vessels will also fully comply with international regulations (COLREGS) to negate the requirement for fishing vessels engaged in fishing to alter course or to pose any risk to fishing gears being towed.
- 18.5.49 With full compliance to the above, there should be a **negligible** impact.

### Adverse impacts on commercially exploited species

- 18.5.50 The potential impacts to fish and shellfish, including commercially exploited species, are presented in Section 8 -Fish and Shellfish Ecology).
- 18.5.51 As discussed in Section 8, the effects of piling noise are of concern in respect of the potential impacts on fish ecology as a consequence of the effects of avoidance behavioral reactions.
- 18.5.52 Given in Table 18.7 are the average landings values for the four ICES rectangles of relevance in respect of potential noise related impacts.
- 18.5.53 As discussed in Section 8 - Fish and Shellfish, and presented in more detail in Appendix 8.6 - noise contours have been produced for cod, herring, dab (surrogate for Dover sole and plaice), red bream (surrogate for black bream) and bass. In the case of bass, red bream and dab the 90 and 75dB<sub>ht</sub> contours are within the boundaries of ICES rectangle 30E9, whereas for herring and cod these extend into adjacent rectangles, mainly 29E9.
- 18.5.54 The maximum number of the largest piles to be installed is expected to be 90, with individual piling events estimated to take approximately 2 hours with a predicted schedule of one pile per day being installed. During these periods of piling it is likely that hearing sensitive species may exhibit some avoidance behavior by swimming away from the piling source. As such, when piling is occurring there, may be an indirect effect on fishing activities which could result in the requirement for temporary changes in fishing practices. Fish may also habituate to piling noise over time.

**Table 18.7: Average landings values (2006-2010) of the top 10 Species (29E9, 29F0, 30E9 & 30F0 combined) and other hearing specialists by vessel length (Source: MMO, 2011)**

| Species        | 29E9   |          | 29F0 |            | 30E9     |          | 30F0       |          | Total      |
|----------------|--------|----------|------|------------|----------|----------|------------|----------|------------|
|                | U10m   | Over 10m | U10m | Over 10m   | U10m     | Over 10m | U10m       | Over 10m |            |
| Scallops       | £300   | £776,394 | £1   | £3,479,123 | £60,331  | £696,259 | £243,368   | £649,629 | £5,905,404 |
| Sole           | £489   | £140,125 | £7   | £49,154    | £533,304 | £430,801 | £1,947,017 | £518,720 | £3,619,618 |
| Whelks         | £4,281 | £50,623  | £0   | £0         | £872,600 | £369,696 | £273,665   | £143,840 | £1,714,706 |
| Herring        | £0     | £491,140 | £0   | £707,773   | £279     | £9,154   | £5,407     | £1,423   | £1,215,176 |
| Bass           | £1,693 | £68,441  | £0   | £46,864    | £366,228 | £221,637 | £339,933   | £50,034  | £1,094,830 |
| Red Mullet     | £15    | £305,235 | £0   | £196,295   | £5,273   | £21,384  | £9,473     | £185,024 | £722,699   |
| Lobsters       | £5,139 | £5,891   | £0   | £33        | £397,419 | £99,976  | £117,055   | £66,925  | £692,439   |
| Cuttlefish     | £2,239 | £12,541  | £0   | £23,717    | £347,962 | £36,538  | £182,615   | £32,942  | £638,554   |
| Horse Mackerel | £0     | £179,174 | £0   | £184,318   | £65      | £71,245  | £360       | £162,064 | £597,227   |
| Plaice         | £340   | £15,893  | £5   | £8,778     | £43,761  | £116,697 | £268,888   | £141,769 | £596,133   |
| Cod            | £0     | £5,970   | £1   | £6,031     | £1       | £12,445  | £124,567   | £31,300  | £180,314   |
| Black Seabream | £9     | £10,808  | £0   | £3,425     | £9       | £156,458 | £1,457     | £3,357   | £175,523   |

**Table 18.8: Average landings values (2006-2010) of the top 10 Species (929E9, 29F0, 30E9 & 30F0 combined) and other hearing specialists as a percentage of the total in each rectangle and by vessel category (Source: MMO, 2011)**

| Species        | 29E9 |          | 29F0 |          | 30E9  |          | 30F0  |          |
|----------------|------|----------|------|----------|-------|----------|-------|----------|
|                | U10m | Over 10m | U10m | Over 10m | U10m  | Over 10m | U10m  | Over 10m |
| Scallops       | 0.0% | 32.4%    | 0.0% | 70.1%    | 1.0%  | 12.0%    | 3.5%  | 9.4%     |
| Sole           | 0.0% | 5.8%     | 0.0% | 1.0%     | 9.2%  | 7.4%     | 28.2% | 7.5%     |
| Whelks         | 0.2% | 2.1%     | 0.0% | 0.0%     | 15.1% | 6.4%     | 4.0%  | 2.1%     |
| Herring        | 0.0% | 20.5%    | 0.0% | 14.3%    | 0.0%  | 0.2%     | 0.1%  | 0.0%     |
| Bass           | 0.1% | 2.9%     | 0.0% | 0.9%     | 6.3%  | 3.8%     | 4.9%  | 0.7%     |
| Red Mullet     | 0.0% | 12.7%    | 0.0% | 4.0%     | 0.1%  | 0.4%     | 0.1%  | 2.7%     |
| Lobsters       | 0.2% | 0.2%     | 0.0% | 0.0%     | 6.9%  | 1.7%     | 1.7%  | 1.0%     |
| Cuttlefish     | 0.1% | 0.5%     | 0.0% | 0.5%     | 6.0%  | 0.6%     | 2.6%  | 0.5%     |
| Horse Mackerel | 0.0% | 7.5%     | 0.0% | 3.7%     | 0.0%  | 1.2%     | 0.0%  | 2.3%     |
| Plaice         | 0.0% | 0.7%     | 0.0% | 0.2%     | 0.8%  | 2.0%     | 3.9%  | 2.1%     |
| Cod            | 0.0% | 0.2%     | 0.0% | 0.1%     | 1.0%  | 0.2%     | 1.8%  | 0.5%     |
| Black Seabream | 0.0% | 0.5%     | 0.0% | 0.1%     | 0.1%  | 2.7%     | 0.0%  | 0.0%     |

18.5.55 As shown from Table 18.7 and Table 18.8 a significant proportion of the landings values are from shellfish species (scallop, lobster and whelk) which are not expected to exhibit avoidance reaction to noise. As such it is likely that the impact on these fisheries will be negligible.

18.5.56 In the case of herring and cod, which the noise assessment suggest may exhibit significant avoidance reactions over a relatively large area, as shown by Table 18.7 these species make a small contribution in 30E9. Significant landings values are recorded however for herring in the two further offshore rectangles into which the 75dB<sub>ht</sub> contour impinges. It is however possible that the herring fishery occurs beyond the 75dB<sub>ht</sub> contour and therefore would not be affected. In the case of the local fleet, herring does not represent an important target species, and as shown by Table 18.8, herring landings represent only 0.2% of landing values in 30E9, in which the majority of local activity occurs. Therefore the direct impact on local vessels of noise on herring is expected to be negligible. The impact on commercial fisheries associated with these species is therefore expected to be **minor**.

18.5.57 The 75dB<sub>ht</sub> contours for black bream, bass and Dover sole almost all fall within ICES rectangle 30E9. As it appears for Table 18.7 and Table 18.8, these species make a significant contribution to the landings values from this rectangle. In the case of black bream the main fishing period coincides with the spawning period of this species. A restriction of piling in relation to black bream spawning should therefore mitigate the potential impacts on this fishery. The landings data for Dover sole and bass however suggest that fishing for these species occurs



throughout the year with the result that if strong avoidance were to occur, there may be a **significant** impact on commercial fisheries.

- 18.5.58 In the case of Dover sole, there is some evidence to suggest that this species may not exhibit strong avoidance behavior to piling noise. From operations undertaken when piling was taking place at a UK offshore wind farm (personal observation, BMM, 2010b) little evidence of avoidance was found to piling at ranges of between 750 and 2000m from the piling source. It is also possible that the effect of avoidance would depend on the location of the fish prior to commencement of piling. For example fish to the north of the site might respond by swimming further inshore. With the available knowledge it is not possible to determine the scale of the impacts on commercial fishing due to the avoidance reactions of black bream, bass and Dover sole. Taking the precautionary approach, it is possible that for certain of the local vessels there could be a **significant** impact and as such, potential mitigation options, are being explored.

### Operation

#### Complete loss of fishing grounds

- 18.5.59 Existing legislation does not currently prohibit fishing from occurring within operational wind farm sites however it should be noted that 50m safety zones around infrastructure may apply. Full details of the layout options and worst case scenarios for seabed take are given in Section 2a – Offshore Project Description.
- 18.5.60 Trawling and potting activity has been observed in a number of operational wind farms, including Barrow, Kentish Flats and Gunfleet Sands (BMM, 2007; 2008; 2010a; 2011; 2012a; 2012b; 2012c). It is however, recognised that the location of wind farm infrastructure may result in changes to current fishing practices.
- 18.5.61 It is intended that inter-array and export cables will be buried where feasible, with protection by other means if burial is not possible (Section 2a - Offshore Project Description and Section 6 - Physical Environment). In the event that seabed rectification procedures are required, and where practicably feasible, the appropriate measures will be undertaken to ensure that the seabed is returned to a condition whereby fishing can resume. As such, it is considered that there will be no significant impacts on commercial fishing activities associated with the export cabling in its operational phase. It is however recognised that certain skippers may choose not to fish within the operational project site. The sensitivities of receptors during the operational phase are considered to be the same as during the construction phase.
- 18.5.62 Reproduced from Linnane *et al.* (2000), Table 18.9 summarises research into the penetration depths of otter and beam trawl gears in various seabed types. The findings suggest that the target burial depth of at least 1m would be sufficient to prevent contact with otter and beam trawl gears. As shown, the research was undertaken between 1970 and 1998. As a consequence of rising fuel prices,

there has been a recent focus to reduce drag from trawl doors and beams and therefore the penetration depths by gear.

**Table 18.9: Fishing gear seabed penetrations depths (Linnane *et al.*, 2000)**

| Gear Type            | Penetration Depth             | Reference                              | Substratum                   |
|----------------------|-------------------------------|----------------------------------------|------------------------------|
| Otter boards         | 100mm to 150mm                | Arntz and Weber, 1970                  | Muddy fine sand              |
| Otter trawl ticklers | A thin layer of top substrate | Bridger, 1970                          | Sand                         |
| Beam trawls          | 80mm to 100mm                 | Margetts and Bridger, 1971             | Muddy sand                   |
| Beam trawls          | 100mm to 200mm                | Houghton <i>et al.</i> , 1971          | Sand                         |
| Beam trawls          | 0mm to 27mm                   | Bridger, 1932                          | Mud                          |
| Beam trawls          | Rather limited                | De Clerck and Hovart, 1972             | Rough ground                 |
| Otter boards         | Few centimetres               | Caddy, 1973                            | Sandy sediment               |
| Beam trawls          | 10mm to 30mm                  | De Groot, 1984                         | Mud, sand                    |
| Otter boards         | 200mm                         | Khandriche <i>et al.</i> , 1986        | Mud                          |
| Beam trawls          | A few centimetres             | Blom, 1990                             | Sand                         |
| Beam trawls          | Approximately 60mm            | Bergman <i>et al.</i> , 1990           | Fine to medium hard sand     |
| Otter boards         | 5mm to 200mm                  | Krost <i>et al.</i> , 1990             | Mud, sand                    |
| Rollers on foot rope | 20mm to 50mm                  |                                        |                              |
| Beam trawls          | 200mm                         | Laane <i>et al.</i> , 1990             | Mud, sand                    |
| Beam trawls          | 20mm to 300mm                 | Rauck, 1998                            | Mud, sand                    |
| Otter boards         | 5mm to 170mm                  | Rumohr (in Krost <i>et al.</i> , 1990) | Mud, sand                    |
| Beam trawls          | 40mm to 70mm                  | Laban and Lindeboom, 1991              | Fine sand                    |
| Beam trawls          | 50mm to 60mm                  | BEON, 1991                             | Fine sand                    |
| Otter boards         | Few centimetres to 300mm      | Jones, 1992                            | Deepest in soft mud          |
| Beam trawls          | 20mm to 40mm                  | Santbrink and Bergman, 1994            | Fine to medium sand sediment |
| Beam trawls          | 15mm to 70mm                  | De Groot, 1995                         | Substratum dependant         |
| Otter boards         | Approximately 140mm           | Lindeboom and de Groot (edit.), 1998   | Mud                          |

18.5.63 *UK fixed net fishery*: Taking the worst case scenario that skippers elect not to deploy the their gears within the operational site, in terms of the proportional loss of area discussed above, the magnitude of the effect would be **small** giving a **minor** impact. It may however, be the case that skippers will deploy their gears

within the operational wind farm, in which case the magnitude and therefore the impact would be reduced to possibly **negligible**.

- 18.5.64 *UK drift net fishery*: It is assumed that drift nets will not be able to be deployed within the operational project site, due to the risk of the nets fouling on the turbines. As discussed above however, the value of this fishery is low and the SIFCA evidence suggests that there is no history of this activity occurring within the area of the Project site. As such the magnitude of the effect will be at worst **small** and taking the **medium** receptor sensitivity, the potential impact is assessed as **minor** but in reality may well be **negligible**.
- 18.5.65 *UK pot and trap fishery*: As stated above, the evidence for currently operational wind farms suggests that potting should be able to resume within the operational Offshore Project site. Evidence from observation trips onboard potting vessels within the Barrow wind farm site also suggest that commercially viable catch rates occur within operational wind farms. It is also speculated (Linley *et al.*, 2007) that installed infrastructure and scour protection may provide a beneficial habitat for crabs and lobsters with associated benefits to potting fisheries. As a consequence it is expected that the magnitude of the effect will be **negligible** and possibly even **beneficial**, with the result that the impact will also be **negligible** and possibly **beneficial**.
- 18.5.66 *UK hook and line fishery*: The impacts on the hook and line fishery are expected to be **negligible**, as this activity should be able to take place within the operational site.
- 18.5.67 *UK demersal otter trawl fishery*: As discussed above, it may be feasible for demersal otter trawling to resume within the operational site, although it is appreciated that there will be a requirement to modify towing patterns. If catch rates and landings over the course of a year are similar to those obtained prior to the onset of construction of the project, there will be **negligible** impact. If however skippers elect not to fish within the site, due to the proportionally small loss of area and the possibility that this loss could be mitigated by fishing adjacent areas, the magnitude of the effect would be **small**, which in conjunction with the **medium** sensitivity of the receptor, would result in a **minor** predicted impact.
- 18.5.68 *UK pair trawling*: Taking the distances between turbine rows and the operational widths of pair trawling, as with demersal otter trawling, it may be possible that pair trawling could take place within the project site with the result that there would be a **negligible** impact. If however it was not considered to be practical, in view of migratory nature of the species and the proportionally small area affected, the magnitude of the impact would be **small** with a resultant **minor** impact.
- 18.5.69 *UK beam trawl fishery*: Assuming that the inter-array cables are sufficiently buried and protected, it should be possible for beam trawling to take place within the operational wind farm site, resulting in a **negligible** impact. Taking the

worst case however, such that beam trawling was not able to resume within the project site, whilst accepting the longer temporal context, the loss of fishing area is proportionally small, rendering the magnitude of the effect **small**. Taking the low sensitivity of the receptors, the impact on this fishery is expected to be **minor**.

18.5.70 *UK scallop dredge fishery*: Whilst local vessels may be able to resume scallop dredging within the operational wind farm site, for this assessment it is assumed that it will not be possible. As previously discussed in view of the extent of alternative fishing grounds, the sensitivity of this fishery is **low**. Also, in terms of proportional permanent loss of area, the magnitude of the effect is **small** giving a **minor** impact. There may however be a beneficial effect of scalloping not occurring with the project site. As discussed below, the presence of discrete closed parent stock areas can have the effect of increasing local spat production and settlement with a longer term beneficial effect on stocks and fisheries.

18.5.71 *UK nomadic scallop dredge fishery*: As discussed above due to restrictions placed on the number of dredges per side which can be operated within 12nm under the Scallop Order 2012, the majority of the nomadic scallop dredge vessels cannot target grounds in the vicinity of the ROWF site or cable route. Considering this and the proportion of the total grounds occupied by the ROWF site, the impact on this fleet is expected to be **negligible**.

18.5.72 *Belgian beam trawl fishery*: As for the construction phase, due to the low receptor sensitivity and the proportional fishing area involved, the impact on Belgian beam trawlers is expected to be **negligible**.

18.5.73 *French trawl fishery*: As with the UK trawlers, French otter trawlers should be able to fish within the operational wind farm site, a view confirmed during consultation with French fishermen. It is therefore expected that there will be a **negligible** loss of fishing impact.

Increased steaming times to fishing grounds

18.5.74 In view of the distances between turbines, fishing vessels should be able to steam through the Project site without any significant deviation from existing routes. As such, with the exception of adverse weather conditions (during which local vessels would be unlikely to be at sea) there is likely to be little or no impact. Further information can be found in Section 14 - Navigation and Shipping. Therefore, the impact upon steaming distances and times of all fishing vessels is considered to be of **negligible** significance.

Seabed objects and obstructions

18.5.75 Construction and maintenance contractors engaged in the installation works will be contractually prevented from discarding objects and material as part of the Project's marine license and any accidentally dropped objects will have to be

recovered. As such there will be a **negligible** impact associated with seabed objects.

#### Interference with fishing activities

18.5.76 As the same policies and procedures will be in place, as discussed above for the construction phase to prevent project vessels interfering with static fishing gears and mobile gear vessels, the impact should be **negligible**.

18.5.77 The effects of operational noise are discussed in Section 8 - Fish and Shellfish. Whilst there is a degree of uncertainty as to the effects of operational turbine noise, post construction fish surveys undertaken by BMM (2007, 2008, 2010a, 2011, 2012a, 2012b, 2012c) within a variety of operational wind farms suggest that there is no obvious avoidance reactions by fish to turbine noise.

#### Electromagnetic Fields

18.5.78 As discussed in Section 8, there is a degree of uncertainty with regard to electromagnetic fields and it is unlikely that if any effects occur they will be so localised that they do not significantly impact commercial fisheries.

#### Decommissioning

18.5.79 As previously stated it has been assumed that the impacts of decommissioning will not be greater as those assessed above for the construction phase and will be subject to a specific EIA and Marine Licence. It is however recognized that if there are any beneficial effects associated with the operational phase, they could be lost by decommissioning of the project. It is also recognized that the commercial fisheries baseline at the time of decommissioning is likely to be different from the current baseline.

### 18.6 Mitigation Measures

---

18.6.1 Proposed mitigation measures, and residual impacts, are summarised in Table 18.11.

#### Construction

##### Piling noise

18.6.2 As noted in Section 8 – Fish and Shellfish Ecology – a ‘soft start’ procedure will be used at the commencement of each piling event to allow species sensitive to noise (including commercially exploited fish and shellfish species) to move away from the immediate vicinity of the piling. Installation of foundations for the Project is expected to take approximately 12 months, with individual piling events taking an average of 2 hours (ranging between 1 and 4 hours), with a maximum of one large monopile being installed every 24 hours.

18.6.3 Seasonal and/or spatial restrictions on piling to minimise impacts on commercially exploited fish species are under consideration and will be developed in consultation between the developer and the MMO.

18.6.4 Mitigation measures would be applied with the aim of reducing the residual effect to an impact of **moderate** significance, or lower.

#### Fishing activity

18.6.5 E.ON has established a Commercial Fisheries Working Group with the objective of maintaining ongoing dialogue with the local fishing communities. A primary objective of the Working Group is to integrate fishermen's concerns into the Fisheries Engagement Plan. This will set out the protocol for engagement with fishermen throughout the construction and operational phases. In addition, protocols will be agreed for navigation routes for wind farm construction and works vessels to and from the site via approved transit lanes. Procedures will also be established in the event of interactions between wind farm construction and fishing activities (i.e. claims for lost and/or damaged gear).

18.6.6 During the construction period it will be necessary to instigate exclusion zones, within which fishing will be prohibited. It should be noted that in other fishing areas such as Ramsey Bay, Isle of Man where activity has been prohibited for a defined period, recovery, and an increase in scallop numbers has been recorded (Isle of Man Department of Environment, Food and Agriculture, 2010). The procedure of closing these fishing grounds has been supported by the local fishermen to safe guard the future of their fishery.

18.6.7 During the various phases of the Offshore Project development, it is expected that local fishing vessels, with the appropriate certification, will continue to be employed to undertake surveys and, if required, may also be contracted to undertake guard ship duties.

18.6.8 Any temporarily unburied cables will be guarded and statutory safety procedures implemented until complete burial is achieved and has been confirmed by survey. Should any post construction surveys highlight the presence of seabed features attributable to the development, rectification measures will be implemented.

#### Safety issues

18.6.9 In order to reduce the likelihood of occurrence of safety issues in the construction phase, ongoing communication with fishing vessels via direct interaction and weekly Notice to Mariners that will highlight any changes in the positioning of safety zones or dedicated construction traffic routes. If required, guard vessels will be employed to ensure that fishing vessels remain clear of potential snagging risks such as unburied cables. In addition there will be a code of practice for crews of construction and maintenance vessels to minimise interference with those undertaking fishing. All partially or fully installed turbines

and other associated infrastructure will be marked and lit in line with required navigational standards.

18.6.10 There are likely to be multiple construction events occurring at locations across the project site and construction safety zones of 500m will be operational around offshore construction activities. It should be noted that for specific operations such as cable laying, fishing activity cannot resume until appropriate post installation surveys have been undertaken and any necessary rectification measures undertaken.

18.6.11 A marine coordinator will be appointed who can facilitate information dissemination to all potentially impacted parties. It should be noted that in accordance with standard marine practice, the ultimate responsibility for fishing in the vicinity of safety zones lies with the master of a vessel.

#### Operation

18.6.12 Fishermen will be made fully aware of the locations of cables, their status and the turbines and sub-stations. These will be marked and lit to industry standards, as well as marked on admiralty charts.

18.6.13 Codes of conduct to avoid conflicts between operation/ maintenance vessels, and fishing vessels, will be established.

### 18.7 Significance of Residual Effects

---

18.7.1 Residual impacts, and proposed mitigation measures during construction/ decommissioning and operation, are summarized in Table 18.11.

#### During Decommissioning

18.7.2 Upon decommissioning, appropriate mitigation measures will be proposed as necessary, based on both an assessment of likely impacts and the recognised best practice at the time with the intention of reducing impacts as far as possible. It is likely that impacts during decommissioning will be lower than those experienced during the construction phase.

### 18.8 Cumulative Impacts

---

18.8.1 An assessment of cumulative impacts on commercial fishing activities arising from the construction and operation of the project site, in conjunction with other existing and foreseeable planned project and development activities, takes into account the elements listed below.



## Operational, Planned or Under Construction Offshore Wind Farms

- 18.8.2 The other developments located in the Southern North Sea and the English Channel are given in Table 18.10 along with the assessment their potential to contribute to cumulative impacts.
- 18.8.3 The contribution of the Offshore Project to the cumulative impact will be a function of the scale of the impacts of the development on the various receptor groups and the extent to which those receptors are impacted by other developments. Construction-related cumulative loss of fishing area would only occur where construction phases of one or more sites coincide, which will depend on project size and timescales. It should be noted that many of the listed projects are still at the concept stage.
- 18.8.4 Due to the limited operational range, the under-10m vessels which operate static gillnets, driftnets, pots, traps and hooks and lines, target grounds in close vicinity to their home port, it is considered therefore that there will be **negligible** cumulative impacts on these vessels from any of the wind farms listed in Table 18.10.
- 18.8.5 Local vessels operating bottom otter and pair trawls, beam trawls and scallop dredges are generally larger vessels (10-15m or >15m in length) and potentially equipped to target grounds further from their home ports. Due to the current focus on targeting species within local grounds however, these vessels rarely operate outside the English Channel. The only other wind farm development with the potential to cumulatively impact these vessels is the Navitus Bay development which is currently at the pre-consent stage. The potential cumulative impact is therefore considered to be **minor to negligible**.
- 18.8.6 As previously stated the fishing grounds of the UK nomadic scallop fleet are extensive including areas of the Irish Sea and off the Scottish coast and in the North Sea. Developments in these areas could therefore have a cumulative impact on these vessels. However, due to the negligible impact associated with the Offshore Project, the contribution of the development to the cumulative effect will also be **negligible**.
- 18.8.7 As illustrated in Figure 18.26, Belgian fishing grounds are extensive. As it is considered that the impact of the Offshore Project will be negligible, its contribution to the cumulative impact will also be **negligible**.
- 18.8.8 Similarly it has been assessed that the Offshore Project will have a negligible impact on French trawling, its contribution to the cumulative impact will be **negligible**.
- 18.8.9 In respect of seabed obstacles and safety issues to fishing vessels, it is assumed that all wind farm developers will adhere to the required standards and that the cumulative impacts will be negligible. Similarly it is assumed that other wind farm operators will have the necessary policies and procedures to ensure construction and maintenance vessels do not cause interference to fishing activities.

**Table 18.10: Proposed developments assessed for cumulative impacts on commercial fisheries**

| Wind Farm by Nationality  | Status                                                               | Assessment of cumulative impact of other wind farm developments by fishery |                      |                         |                          |                                 |                       |                       |                                 |                                     |                            |                      |
|---------------------------|----------------------------------------------------------------------|----------------------------------------------------------------------------|----------------------|-------------------------|--------------------------|---------------------------------|-----------------------|-----------------------|---------------------------------|-------------------------------------|----------------------------|----------------------|
|                           |                                                                      | UK Fixed Net Fishery                                                       | UK Drift Net Fishery | UK Pot and Trap Fishery | UK Hook and Line Fishery | UK Demersal Otter Trawl Fishery | UK Pair Trawl Fishery | UK Beam Trawl Fishery | UK Local Scallop Dredge Fishery | UK Nomadic Scallop Dredging Fishery | Belgian Beam Trawl Fishery | French Trawl Fishery |
| UK                        |                                                                      |                                                                            |                      |                         |                          |                                 |                       |                       |                                 |                                     |                            |                      |
| Thanet                    | Fully commissioned                                                   | No                                                                         | No                   | No                      | No                       | Minor                           | Minor                 | Minor                 | No                              | No                                  | Moderate                   | Minor                |
| Kentish Flats             | Fully commissioned                                                   | No                                                                         | No                   | No                      | No                       | Minor                           | Minor                 | Minor                 | No                              | No                                  | No                         | No                   |
| Kentish Flats Extension   | Consent application submitted                                        | No                                                                         | No                   | No                      | No                       | Minor                           | Minor                 | Minor                 | No                              | No                                  | No                         | No                   |
| Gunfleet Sands            | Fully commissioned                                                   | No                                                                         | No                   | No                      | No                       | Minor                           | Minor                 | Minor                 | No                              | No                                  | No                         | No                   |
| London Array              | Under construction (Phase 1)/consent application submitted (Phase 2) | No                                                                         | No                   | No                      | No                       | Minor                           | Minor                 | Minor                 | No                              | No                                  | No                         | No                   |
| Galloper                  | Consent application submitted                                        | No                                                                         | No                   | No                      | No                       | Minor                           | Minor                 | Minor                 | No                              | No                                  | Moderate                   | Minor                |
| East Anglia Offshore Wind | Concept/ early planning                                              | No                                                                         | No                   | No                      | No                       | Minor                           | Minor                 | Minor                 | No                              | No                                  | Moderate                   | Minor                |
| Inner Gabbard             | Partial generation / under construction                              | No                                                                         | No                   | No                      | No                       | Minor                           | Minor                 | Minor                 | No                              | No                                  | Moderate                   | Minor                |

| Wind Farm by Nationality    | Status                        | Assessment of cumulative impact of other wind farm developments by fishery |                      |                         |                          |                                 |                       |                       |                                 |                                     |                            |                      |
|-----------------------------|-------------------------------|----------------------------------------------------------------------------|----------------------|-------------------------|--------------------------|---------------------------------|-----------------------|-----------------------|---------------------------------|-------------------------------------|----------------------------|----------------------|
|                             |                               | UK Fixed Net Fishery                                                       | UK Drift Net Fishery | UK Pot and Trap Fishery | UK Hook and Line Fishery | UK Demersal Otter Trawl Fishery | UK Pair Trawl Fishery | UK Beam Trawl Fishery | UK Local Scallop Dredge Fishery | UK Nomadic Scallop Dredging Fishery | Belgian Beam Trawl Fishery | French Trawl Fishery |
| Navitus Bay Wind Park       | Concept/ early planning       | No                                                                         | No                   | No                      | No                       | Moderate                        | Moderate              | Moderate              | Minor                           | No                                  | No                         | No                   |
| Irish Sea Round 3           | Concept/ early planning       | No                                                                         | No                   | No                      | No                       | No                              | No                    | No                    | No                              | Moderate                            | Moderate                   | No                   |
| Moray Firth Round 3 Zone    | Concept/ early planning       | No                                                                         | No                   | No                      | No                       | No                              | No                    | No                    | No                              | Moderate                            | No                         | No                   |
| Firth of Forth Round 3 Zone | Concept/ early planning       | No                                                                         | No                   | No                      | No                       | No                              | No                    | No                    | No                              | Moderate                            | No                         | No                   |
| Inchcape                    | Concept/ early planning       | No                                                                         | No                   | No                      | No                       | No                              | No                    | No                    | No                              | Moderate                            | No                         | No                   |
| France                      |                               |                                                                            |                      |                         |                          |                                 |                       |                       |                                 |                                     |                            |                      |
| Maia                        | Concept/ early planning       | No                                                                         | No                   | No                      | No                       | No                              | No                    | No                    | No                              | No                                  | To be assessed             | To be assessed       |
| Baie de Seine               | Consent application submitted | No                                                                         | No                   | No                      | No                       | No                              | No                    | No                    | No                              | No                                  | To be assessed             | To be assessed       |
| Courseulles Sur Mer         | Development zone              | No                                                                         | No                   | No                      | No                       | No                              | No                    | No                    | No                              | No                                  | To be assessed             | To be assessed       |
| Fecamp WPD                  | Concept/ early planning       | No                                                                         | No                   | No                      | No                       | No                              | No                    | No                    | No                              | No                                  | To be assessed             | To be assessed       |
| Fecamp                      | Development zone              | No                                                                         | No                   | No                      | No                       | No                              | No                    | No                    | No                              | No                                  | To be assessed             | To be assessed       |
| Fecamp GDF Suez             | Concept/ early planning       | No                                                                         | No                   | No                      | No                       | No                              | No                    | No                    | No                              | No                                  | To be assessed             | To be assessed       |
| Pointe de Caux              | Concept/ early planning       | No                                                                         | No                   | No                      | No                       | No                              | No                    | No                    | No                              | No                                  | To be assessed             | To be assessed       |

| Wind Farm by Nationality | Status                        | Assessment of cumulative impact of other wind farm developments by fishery |                      |                         |                          |                                 |                       |                       |                                 |                                     |                            |                      |
|--------------------------|-------------------------------|----------------------------------------------------------------------------|----------------------|-------------------------|--------------------------|---------------------------------|-----------------------|-----------------------|---------------------------------|-------------------------------------|----------------------------|----------------------|
|                          |                               | UK Fixed Net Fishery                                                       | UK Drift Net Fishery | UK Pot and Trap Fishery | UK Hook and Line Fishery | UK Demersal Otter Trawl Fishery | UK Pair Trawl Fishery | UK Beam Trawl Fishery | UK Local Scallop Dredge Fishery | UK Nomadic Scallop Dredging Fishery | Belgian Beam Trawl Fishery | French Trawl Fishery |
| Cote d'Albatre           | Consent authorised            | No                                                                         | No                   | No                      | No                       | No                              | No                    | No                    | No                              | No                                  | To be assessed             | To be assessed       |
| Cote d'Albatre II        | Concept/ early planning       | No                                                                         | No                   | No                      | No                       | No                              | No                    | No                    | No                              | No                                  | To be assessed             | To be assessed       |
| Haute Normandie          | Concept/ early planning       | No                                                                         | No                   | No                      | No                       | No                              | No                    | No                    | No                              | No                                  | To be assessed             | To be assessed       |
| Deux Cotes               | Consent application submitted | No                                                                         | No                   | No                      | No                       | No                              | No                    | No                    | No                              | No                                  | To be assessed             | To be assessed       |
| Le Preport               | Development zone              | No                                                                         | No                   | No                      | No                       | No                              | No                    | No                    | No                              | No                                  | To be assessed             | To be assessed       |
| Bassure de Baas          | Concept/ early planning       | No                                                                         | No                   | No                      | No                       | No                              | No                    | No                    | No                              | No                                  | To be assessed             | To be assessed       |
| 3B                       | Concept/ early planning       | No                                                                         | No                   | No                      | No                       | No                              | No                    | No                    | No                              | No                                  | To be assessed             | To be assessed       |
| Boulogne                 | Concept/ early planning       | No                                                                         | No                   | No                      | No                       | No                              | No                    | No                    | No                              | No                                  | To be assessed             | To be assessed       |

- 18.8.10 As vessels are expected to be able to navigate through operational wind farms, there should be **negligible** cumulative impact on vessel steaming times. Whilst there may be safety zones implemented during construction periods, these are likely to be temporary and to have a **negligible** cumulative impact on vessel steaming times.

#### Subsea pipelines and cables

- 18.8.11 An England-France HVDC interconnector (Interconnexion France-Angleterre, IFA2) cable is proposed with potential landfalls in the vicinity of the Solent and Caen. It is currently in the feasibility stage and if successful could be operational by 2020.

#### Aggregate dredging

- 18.8.12 Licensed aggregate dredging areas are located in close proximity to the project site (see Figure 19.1 and Section 19 – Other Marine Users), potentially causing cumulative impacts on the vessels with a history of fishing within the Project site. The majority of aggregate dredging areas are located to the east of the Isle of Wight both inside the 6nm and between the 6 and 12nm limits, whilst additional sites are located off the coast of Littlehampton and Shoreham, principally between the 6 and 12nm limits. There are also aggregate dredging sites located off the coast of Eastbourne outside of the 12nm limit (Crown Estates, 2011). Additionally, an area within The Crown Estate Zone 6 has been identified for aggregate development.
- 18.8.13 Vanstaen *et al.* (2010) concluded that “there was no evidence that the introduction of aggregate extraction activities in the Eastern English Channel significantly altered the distribution or intensity of mobile fishing gears in the area”. The cumulative impact of aggregate areas will therefore be **negligible** for the inshore fleet due to distance and at worst **minor** for the larger beam trawlers and scallopers.

#### Marine Protected Areas

- 18.8.14 Under the UK Marine and Coastal Access Act (2009) it is proposed that a number of conservation areas are in place within the local area surrounding the ROWF. Final recommendations for the location of Marine Conservation Zones (MCZs) have been proposed by the Balanced Seas Regional Stakeholder Group (see Section 9 – Nature Conservation, and Figures 9.1 and 9.2), although the exact location, size and level of associated restrictions will be assessed prior to final designation in 2013. As described within Section 9 - Nature Conservation), there are a number of MCZ sites within the English Channel which may contribute to a cumulative impact. At present however, the level of impact cannot be assessed accurately until the number, location and key features of these MCZ have been finalised.
- 18.8.15 In addition there are non-statutory designated Marine Sites of National Conservation Importance (MSNCI) and Voluntary Marine Conservation Areas

within inshore waters. MSNCIs are recognized by local councils and designated by Sussex Seasearch.

- 18.8.16 The offshore MCZs result in a cumulative impact on fixed nets, scallop dredging and beam trawling. The Selsey Bill MCZ could have a cumulative impact on potting and scalloping activity, whilst the Beachy Head site could have a cumulative impact on potting, fixed nets, beam trawling and the cuttlefish trapping. It should be noted that these cumulative impacts will only occur if fishing is restricted or banned in the MCZs.

**Table 18.11: Summary of residual effects and mitigation measures**

| Aspect                                                     | Effect                                                                                | Proposed Mitigation Measures                                                                 | Sensitivity  | Magnitude                                    | Residual Effect                                |
|------------------------------------------------------------|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|--------------|----------------------------------------------|------------------------------------------------|
| <b>Construction Phase</b>                                  |                                                                                       |                                                                                              |              |                                              |                                                |
| Piling noise                                               | <b>Change in the distribution of locally important commercially exploited species</b> | Soft start procedure                                                                         | Medium       | Medium (or below, pending agreed mitigation) | Moderate (or below, pending agreed mitigation) |
|                                                            | <b>Disruption to spawning activity, leading to subsequent reduction in stocks</b>     | Possible seasonal/spatial restrictions on piling (to be agreed with regulatory authorities). |              |                                              |                                                |
| Construction activity and safety zones in the project site | <b>Restricted Access to or loss of Traditional Fishing Grounds:</b>                   | None proposed                                                                                |              |                                              |                                                |
|                                                            | UK Fixed Net fishery                                                                  |                                                                                              | Medium       | Small                                        | Minor                                          |
|                                                            | UK Pot and Trap fishery                                                               |                                                                                              | Medium/ High | Small                                        | Moderate / Minor                               |
|                                                            | UK Drift Net fishery                                                                  |                                                                                              | Medium       | Small                                        | Minor                                          |
|                                                            | UK Hook and line fishery                                                              |                                                                                              | Low          | Small                                        | Minor                                          |
|                                                            | UK Demersal Otter Trawl Fishery,                                                      |                                                                                              | Medium       | Small                                        | Minor                                          |
|                                                            | UK Pair Trawl Fishery                                                                 |                                                                                              | Medium       | Medium/Small                                 | Moderate/Minor                                 |
|                                                            | UK Beam Trawl Fishery, UK Local Scallop Dredge Fishery                                |                                                                                              | Low          | Small                                        | Minor                                          |
|                                                            | UK Nomadic Scallop Dredge Fishery                                                     |                                                                                              | Low          | Negligible                                   | Negligible                                     |



| Aspect                                                                    | Effect                                                                                                             | Proposed Mitigation Measures                                                              | Sensitivity | Magnitude         | Residual Effect   |
|---------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|-------------|-------------------|-------------------|
|                                                                           | Belgian Beam Trawl Fishery, French Trawl Fishery                                                                   |                                                                                           | Low         | Small             | Minor             |
| Construction activity and safety zones in the <b>cable route corridor</b> | <b>Restricted Access to or loss of Traditional Fishing Grounds:</b><br>UK fixed net fishery, UK drift net fishery, | None proposed                                                                             |             |                   |                   |
|                                                                           | UK pot and trap fishery                                                                                            |                                                                                           | Medium      | Small             | Minor             |
|                                                                           | UK Hook and Line Fishery                                                                                           |                                                                                           | Medium      | Small /Negligible | Moderate / Minor  |
|                                                                           | UK Demersal Otter Trawl Fishery, UK Pair Trawl Fishery                                                             |                                                                                           | Low         | Small             | Minor             |
|                                                                           | UK Beam Trawl Fishery                                                                                              |                                                                                           | Medium      | Small             | Minor             |
|                                                                           | UK Local Scallop Dredge Fishery                                                                                    |                                                                                           | Low         | Small             | Minor/ Negligible |
|                                                                           | UK Nomadic Scallop Dredge Fishery                                                                                  |                                                                                           | Low         | Small             | Minor             |
|                                                                           | Belgian Beam Trawl Fishery, French Trawl Fishery                                                                   |                                                                                           | Low         | Negligible        | Negligible        |
| Construction activity and safety zones in the <b>project site</b>         | <b>Increased steaming times to fishing grounds:</b><br>UK Static Gear Vessels                                      | None proposed                                                                             |             |                   |                   |
|                                                                           | UK mobile gear                                                                                                     |                                                                                           | Low         | Small/Negligible  | Minor/ Negligible |
|                                                                           | Non-UK vessels                                                                                                     |                                                                                           | Low         | Small/ Negligible | Minor/ Negligible |
| Construction activity and safety zones in the <b>cable route corridor</b> | <b>Increased steaming times to fishing grounds:</b><br>UK Static Gear Vessels                                      | None proposed                                                                             |             |                   |                   |
|                                                                           | UK mobile gear                                                                                                     |                                                                                           | Low         | Small/ Negligible | Minor/ Negligible |
|                                                                           | Non-UK vessels                                                                                                     |                                                                                           | Low         | Negligible        | Negligible        |
| Construction vessel activity in <b>project site</b>                       | <b>Interference to Fishing Activities:</b><br>UK Static Gear Vessels                                               | Implementation of code of practice for construction vessel crew to minimise interference. |             |                   |                   |
|                                                                           | UK mobile gear                                                                                                     |                                                                                           | Low         | Negligible        | Negligible        |
|                                                                           | Non-UK vessels                                                                                                     |                                                                                           | Low         | Negligible        | Negligible        |

| Aspect                                                                                                                                                  | Effect                                                     | Proposed Mitigation Measures                                                              | Sensitivity                | Magnitude  | Residual Effect   |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|-------------------------------------------------------------------------------------------|----------------------------|------------|-------------------|
| Construction vessel activity in <b>cable route corridor</b>                                                                                             | <b>Interference to Fishing Activities:</b>                 | Implementation of code of practice for construction vessel crew to minimise interference. | Low                        | Negligible | Negligible        |
|                                                                                                                                                         | UK Static Gear Vessels                                     |                                                                                           |                            |            |                   |
|                                                                                                                                                         | UK Mobile Gear Vessels                                     |                                                                                           | Low                        | Negligible | Negligible        |
|                                                                                                                                                         | Non-UK Vessels                                             |                                                                                           | Low                        | Negligible | Negligible        |
| Operational Phase                                                                                                                                       |                                                            |                                                                                           |                            |            |                   |
| Presence of infrastructure                                                                                                                              | <b>Loss of Traditional Fishing Grounds:</b>                | None proposed                                                                             | Medium                     | Small      | Minor             |
|                                                                                                                                                         | UK Fixed Net Fishery                                       |                                                                                           |                            |            |                   |
|                                                                                                                                                         | UK Driftnet Fishery                                        |                                                                                           | Medium                     | Small      | Minor/ Negligible |
|                                                                                                                                                         | UK Pot and Trap Fishery                                    |                                                                                           | Low                        | Negligible | Negligible        |
|                                                                                                                                                         | UK Hook and Line Fishery                                   |                                                                                           | Low                        | Negligible | Negligible        |
|                                                                                                                                                         | UK Demersal Otter Trawl Fishery                            |                                                                                           | Medium                     | Small      | Minor             |
|                                                                                                                                                         | UK Pair Trawl Fishery                                      |                                                                                           | Medium                     | Small      | Minor             |
|                                                                                                                                                         | UK Beam Trawl Fishery                                      |                                                                                           | Low                        | Small      | Minor             |
|                                                                                                                                                         | UK Local Scallop Dredge Fishery                            |                                                                                           | Low                        | Small      | Minor             |
|                                                                                                                                                         | UK Nomadic Scallop Dredge Fishery                          |                                                                                           | Low                        | Negligible | Negligible        |
|                                                                                                                                                         |                                                            |                                                                                           | Belgian Beam Trawl Fishery | Low        | Negligible        |
|                                                                                                                                                         | French Trawl Fishery                                       | Low                                                                                       | Negligible                 | Negligible |                   |
| Presence of infrastructure                                                                                                                              | Increased Steaming Times to Fishing Grounds; all fisheries | None proposed                                                                             | Low                        | Negligible | Negligible        |
| Vessel activity: operation/                                                                                                                             | Interference to Fishing Activities: all fisheries          | None proposed                                                                             | Low                        | Negligible | Negligible        |
| Maintenance                                                                                                                                             |                                                            |                                                                                           |                            |            |                   |
| Decommissioning Phase                                                                                                                                   |                                                            |                                                                                           |                            |            |                   |
| Effects from the decommissioning of the various wind farm components will be subject to a detailed assessment during the decommissioning planning study |                                                            |                                                                                           |                            |            |                   |

---

## 18.9 References

---

Blyth-Skyrme, R.E. (2010) Options and opportunities for marine fisheries mitigation associated with wind farms. Final Report for Collaborative Offshore Wind Research into the Environment. Cowrie Limited, London.

Brown & May Marine Limited (2007) Spring Post Construction Adult Fish Survey (Barrow Wind Farm).

Brown & May Marine Limited (2008) Trawl Survey Kentish Flats Offshore Wind Farm.

Brown & May Marine Limited (2010a) Gunfleet Sands Offshore Wind Farm Post Construction Fish Survey.

Brown & May Marine Limited (2010b) Personal Observation, Survey, 9<sup>th</sup> April – 13<sup>th</sup> May 2010.

Brown & May Marine Limited (2011) Gunfleet Sands Offshore Wind Farm Post Construction Fish Survey.

Brown & May Marine Limited (2012a) Gunfleet Sands Offshore Wind Farm Post Construction Fish Survey.

Brown & May Marine Limited (2012b) Thanet Offshore Wind Farm Post Construction Fish Survey, April

Brown & May Marine Limited (2012c) Walney Offshore Wind Farm Phase I and II Post Construction Fish Survey, May.

Cefas (2004) Offshore Wind Farms; Guidance note for Environmental Impact Assessment in respect of FEPA & CPA requirements – version 2 – June 2004.

Department of Energy and Climate Change (2011) National Policy Statement for Renewable Energy Infrastructure (EN-3). The Stationary Office.

Isle of Man Department of Environment, Food and Agriculture (2010) News Release – Innovative Manx fishermen lead the way in Marine Nature Reserve selection.

Linley E.A.S., Wilding T.A., Black K., Hawkins A.J.S. and Mangi S. (2007) Review of the Reef Effects of Offshore Wind Farm Structures and Potential for Enhancement and Mitigation. Report from PML Applications Limited to the Department of Trade & Industry, Contract No: RFCA/005/0029P.

Linnane, A., Ball, B., Munday, B., van Marlen, B., Bergman, M. & Fonteyne, R., “A review of potential techniques to reduce the environmental impact of demersal trawls”, Irish Fisheries Investigations No. 7, Marine Institute 2000.

Vanstaen, K., Clark, R., Ware, S., Eggleton, J., James, J.C.W., Cotteril, C., Rance, J., Manco, F. and Woolmer, A. (2010) Assessment of the distribution and intensity of fishing activities in the vicinity of aggregate extraction sites. MALSF-MEPF Project 08/P73. Cefas, Lowestoft.