



Chapter 10

Commercial Fisheries

Poseidon Aquatic Resource
Management Ltd.

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10 Commercial Fisheries

10.1 Introduction

1. This chapter of the Environmental Impact Assessment (EIA) Report presents an assessment of the potential impacts upon commercial fisheries arising from the construction, operation and decommissioning of the Project, as detailed in Chapter 4: Project Description.
2. The assessment is based on a combination of the understanding of the Project in terms of the potential for impact and the resultant effects on receptors that were identified within the study area, as detailed in Appendix 10.1: Commercial Fisheries Technical Report.
3. This chapter is comprised of the following elements:
 - A summary of relevant policy, guidance and legislation;
 - Details of the data sources used to characterise the study area;
 - A summary of the relevant consultations with stakeholders;
 - A description of the methodology for assessing the impacts of the Project, including details of the study area and approach to the assessment of potential effects;
 - A review of the baseline conditions;
 - A description of the worst case design scenario relevant to commercial fisheries;
 - An assessment of the likely effects for the construction, operation and decommissioning phases of the Project, including cumulative effects;
 - Identification of any further mitigation measures or monitoring requirements in respect of any significant effects;
 - A summary of the residual impact assessment determinations taking account of any additional mitigation measures identified.

10.2 Policy, Guidance and Legislation

4. A number of plans and policies exist that are relevant to offshore renewable energy development within Scottish Territorial Waters. These are summarised in Chapter 2: Policy and Legislation and include:
 - 2020 Route Map for Renewable Energy in Scotland
 - Draft Scottish Energy Strategy: The Future of Energy in Scotland
 - Scotland's National Marine Plan: A Single Framework for Managing Our Seas
5. Scotland's National Marine Plan (NMP) includes specific marine planning policies related to commercial fisheries, which should be taken into consideration by marine planners and decision makers. The fisheries marine planning policies 1 to 3 are summarised in Table 10.1¹.

¹ Fisheries policies 4 and 5 are not included as they relate to port and harbour infrastructure and inshore fisheries management, respectively and are not relevant to offshore energy development.

Table 10.1: Summary of Scotland's NMP provisions relevant to commercial fisheries.

Summary of Scotland's NMP provisions	How addressed in the EIA Report
FISHERIES 1: Taking account of the EU's Common Fisheries Policy, Habitats Directive, Birds Directive and Marine Strategy Framework Directive, marine planners and decision makers should aim to ensure:	<ul style="list-style-type: none"> ▪ Existing fishing opportunities and activities are safeguarded wherever possible. ▪ That other sectors take into account the need to protect fish stocks and sustain healthy fisheries for both economic and conservation reasons. ▪ Mechanisms for managing conflicts between fishermen and/or between the fishing sector and other users of the marine environment.
FISHERIES 2: The following key factors should be taken into account when deciding on uses of the marine environment and the potential impact on fishing:	<ul style="list-style-type: none"> ▪ The cultural and economic importance of fishing, in particular to vulnerable coastal communities. ▪ The potential impact (positive and negative) of marine developments on the sustainability of fish and shellfish stocks and resultant fishing opportunities in any given area. ▪ The environmental impact on fishing grounds (such as nursery, spawning areas), commercially shed species, habitats and species more generally. ▪ The potential effect of displacement on: fish stocks; the wider environment; use of fuel; socio-economic costs to fishers and their communities and other marine users.
FISHERIES 3: Where existing fishing opportunities or activity cannot be safeguarded, a Fisheries Management and Mitigation Strategy should be prepared by the proposer of development or use, involving full engagement with local fishing interests (and other interests as appropriate) in the development of the Strategy. All efforts should be made to agree the Strategy with those interests. Those interests should also undertake to engage with the proposer and provide transparent and accurate information and data to help complete the Strategy. The Strategy should be drawn up as part of the discharge of conditions of permissions granted.	<p>The content of the Strategy should be relevant to the particular circumstances and could include:</p> <ul style="list-style-type: none"> ▪ An assessment of the potential impact of the development or use on the affected fishery or fisheries, both in socio-economic terms and in terms of environmental sustainability. ▪ A recognition that the disruption to existing fishing opportunities/activity should be minimised as far as possible. ▪ Reasonable measures to mitigate any constraints which the proposed development or use may place on existing or proposed fishing activity. ▪ Reasonable measures to mitigate any potential impacts on sustainability of fish stocks (e.g. impacts on spawning grounds or areas of fish or shellfish abundance) and any socio- economic impacts.

6. The principal guidance documents and information used to inform the assessment of potential impacts on commercial fisheries are as follows:

- Fishing Liaison with Offshore Wind and Wet Renewables Group (FLOWW) (2014) Best Practice Guidance for Offshore Renewables Developments: Recommendations for Fisheries Liaison;
- FLOWW (2015) Best Practice Guidance for Offshore Renewables Developments: Recommendations for Fisheries Disruption Settlements and Community Funds;
- Marine Scotland (2010) Strategic Environmental Assessment (SEA) of Draft Plan for Offshore Wind Energy in Scottish Territorial Waters: Volume 1: Environmental Report;
- Sea Fish Industry Authority and UK Fisheries Economic Network (UKFEN) (2012) Best practice guidance for fishing industry financial and economic impact assessments;
- Blyth-Skyrme, R.E. (2010a) *Options and opportunities for marine fisheries mitigation associated with wind farms*. Final report for Collaborative Offshore Wind Research into the Environment contract FISHMITIG09. COWRIE Ltd, London;
- Blyth-Skyrme, R.E. (2010) Developing guidance on fisheries CIA for wind farm developers;

- UK Oil and Gas (2008) *Fisheries Liaison Guidelines* - Issue 5; and
- International Cable Protection Committee (2009) *Fishing and Submarine Cables - Working Together*.

10.3 Data Sources

- The assessment considers the potential interaction between the Project, as described in Chapter 4: Project Description, and commercial fisheries receptors within the local and regional commercial fisheries study areas.
- The Development Area is within the northwest portion of the International Council for the Exploration of the Sea (ICES) Division 4b (Central North Sea) and lies inside the 12 nautical miles (NM) limit of Scottish Territorial Waters, within the UK Exclusive Economic Zone (EEZ). For the purposes of recording fisheries landings, ICES Division 4b is divided into statistical rectangles, which are consistent across all Member States operating in the North Sea.
- From a commercial fisheries perspective, the study areas are defined by the ICES statistical rectangles that the Wind Farm Area and Offshore Export Cable Corridor overlaps (Figure 10.1 (Volume 2)). The Development Area overlaps with ICES rectangles 41E7 and 40E7, which form the Local Study Area. The Regional Study Area includes these ICES rectangles (40E7 and 41E7) together with adjacent ICES rectangles: 40E6, 40E8, 41E6, 41E8, 42E7 and 42E8. The Regional Study Area is intended to inform the assessment of any potential displacement into the wider area.
- The commercial fisheries study areas are defined as follows:
 - The Local Study Area: ICES rectangles 40E7 and 41E7, and
 - The Regional Study Area: ICES rectangles 40E6, 40E7, 40E8, 41E6, 41E7, 41E8, 42E7, and 42E8.
- Key fishing ports for vessels operating within the local and Regional Study Areas are presented in Figure 10.2 (Volume 2). A detailed profile of the vessels operating from these ports is provided in Appendix 10.1, including number of vessels, length and age profiles, as well as descriptions of the fishing methods deployed.

10.3.1 Desktop Study

- Baseline characterisation was undertaken through a desk-based study of available data and analysis of commercial fisheries statistics. No specific commercial fisheries surveys were undertaken, but this Chapter is informed by the data sources described in Chapter 7: Fish and Shellfish Ecology and Chapter 11: Shipping and Navigation. Table 10.2 details the data sources used for the baseline characterisation for both the local and Regional Study Areas.
- In addition, consultation with Scottish and Anglo-Scottish inshore and offshore fisheries stakeholders was undertaken to both ground-truth data and to understand temporal and spatial patterns of fishing activity.

Table 10.2: Data sources used to inform the baseline description.

Data Source	Years	Overview
Marine Management Organisation (MMO)	2011 to 2015	<p>Landing statistics data for UK registered vessels by ICES rectangle with data query attributes for: landing year; landing month; vessel length category; country code; ICES rectangle; vessel/gear type; species; live weight (tonnes); and value.</p> <p><i>Note: 2011 to 2015 represents the most up-to-date five-year dataset available at the time data was ground-truthed during commercial fisheries industry consultation.</i></p>

Data Source	Years	Overview
MMO	2016	Landing statistics data for UK registered vessels by ICES rectangle with data query attributes for: landing year; landing month; vessel length category; country code; ICES rectangle; vessel/gear type; species; live weight (tonnes); and value. <i>Note: 2016 data became available in November 2017, and therefore has not been validated / ground-truthed during industry consultation. It is presented within the report to ensure appropriate consideration of the most recent dataset available.</i>
MMO	2013 to 2016	Landing statistics data for UK registered vessels by port of landing with data query attributes for: landing year; landing month; vessel length category; country code; vessel/gear type; port of landing; species; live weight (tonnes); and value. <i>Note: 2012 data was not available in this format and 2013 to 2016 represents the most up-to-date dataset available at the time of industry consultation and at the time of writing.</i>
MMO	2011 to 2015	Vessel Monitoring System (VMS) data for UK registered vessels with attributes for time fishing and value of catch at a resolution of 200th of an ICES rectangle amalgamated for all mobile vessels and all static vessels. <i>Note: 2011 to 2015 represents the most up-to-date five-year dataset available at the time of industry consultation and at the time of writing.</i>
MMO	2011 to 2015	Surveillance data with data query attributes for: sighting date; ICES rectangle; ICES sub-square; latitude; longitude; vessel/gear type; activity; nationality; course; speed; and number of sightings. <i>Note: 2011 to 2015 represents the most up-to-date five-year dataset available at the time of industry consultation and at the time of writing.</i>
European Union Data Collection Framework	2003 to 2016	Long term landings statistics for UK registered vessels for: landing year; quarter; ICES rectangle; vessel length; gear type; species and landed weight (tonnes).
European Union Data Collection Framework	2012 to 2016	Fishing effort data for UK registered vessels for: landing year; quarter; ICES rectangle; vessel length; gear type; species and fishing effort (hours fishing).
European Commission, MMO, Marine Scotland	2010 onwards	Published fisheries controls and legislation.
Marine Traffic/ AIS validation document	2017	Selected on review of data and information presented in the AIS validation document, as relevant to fishing vessels. See Appendix 11.2.
Marine Traffic	2017	AIS records relevant to fishing vessels. See Appendix 11.2.
Succorfish data	2015	Small vessel position data as recorded by the voluntary Succorfish system as available.
Industry consultation	2010 to 2017	Direct consultation with fishermen's associations, federations, fish selling agents, producer organizations, fisheries representatives and non-affiliated fishermen (as detailed in Section 10.4).

10.3.1.1 Landing Statistics

14. Commercial fisheries data on landings and effort are collected by the MMO, Marine Scotland and the EU as part of monitoring and control requirements set out under various EU legislation, in particular:

- The basic regulation that sets out the measures under the EU Common Fisheries Policy: Council regulation (EU) No. 1380/2013; and
 - The regulation that sets out the control system for ensuring compliance with the rules of the common fisheries policy: Council regulation (EU) No. 1224/2009.
15. Skippers and/or vessel owners are required to keep and submit logbooks, and provide landing declarations and sales notes. Landings data for all species are collected and recorded by ICES statistical rectangle and stored in the MMO iFISH database and provided to the EU Joint Research Committee under the EU Data Collection Framework (DCF).
 16. To inform the commercial fisheries assessment, landings data were collated for all EU Member States for all ICES statistical rectangles that overlap the regional commercial fisheries study area, as shown in Figure 10.3 (Volume 2). No non-UK vessels were recorded as having activity within the study area and, therefore, the focus of the assessment is on UK vessels.
 17. Landing statistics were collated across a five-year period (2011 to 2015) and thirteen-year period (2003 to 2015) to capture long-term trends. Landing statistics include all landings into all ports by a country's registered vessels. The following parameters were examined in each dataset:
 - EU DCF database: year; season (month); gear type; ICES rectangle; species; effort (hours fished); and live weight (tonnes) for 2003 to 2016. This is the longest time series available;
 - MMO iFISH database: year; month; gear type; ICES rectangle; species; live weight (tonnes) and first sales value (£) for 2011 to 2015 and 2016. Data for 2016 is presented within the report to ensure appropriate consideration of the most recent dataset available. However, it should be noted that 2016 data became available in November 2017, and therefore has not been validated / ground-truthed during industry consultation. For this reason, 2011 to 2015 forms the time period for the majority of the baseline assessment; and
 - MMO iFISH database: year; month; gear type; port of landing; species; live weight (tonnes) and first sales value (£) for 2013 to 2016. This is the most recent annual data that is publicly available. The MMO publish landings statistics by port of landing, which are updated monthly. The most recent data available at the time of this assessment was for May 2017. This 2017 dataset was explored, however as it represents a partial year (Jan to May), it was not comparable to previous annual statistics and therefore not included within the assessment.
 18. Data limitations for landings statistics are summarised in Section 10.5.2.

10.3.1.2 Vessel Monitoring System data

19. All EU fishing vessels (i.e. fishing vessels registered with an EU Member State), and third-party fishing vessels operating in EU waters, that are ≥ 12 metres (m) in length, are required to have a VMS on board. This reports an EU vessel's position to fisheries management authorities every two hours. Since 1 January 2012, this obligation has applied to vessels that are ≥ 12 m in length (before 1 January 2012 it applied to vessels ≥ 15 m in length, see Council Regulation (EC) No 1224/2009). However, the MMO does not yet include VMS data for vessels between 12 to 14.9 m within its datasets. Therefore, all MMO VMS data (2011 to 2015) presented within this chapter and Appendix 10.1: Commercial Fisheries Technical Report includes only vessels that are ≥ 15 m in length.
20. A vessel's range varies due to weather conditions and skipper preferences as well as technical aspects such as vessel power. It is common that vessels < 12 m in length fish within 20 NM of shore. Vessels ≥ 12 m in length can and do fish further afield, but in recent years many skippers have altered fishing patterns to favour fishing grounds closer to homeports due to operating costs and restrictions placed

on time at sea (i.e. vessels being permitted a specific number of kW days at sea as per EU and national legislation).

21. Although figures mapping VMS data may appear to show inshore areas with lower (or no) fishing activity compared with offshore areas, this is not accurate because VMS data does not include many of the vessels operating in inshore areas (i.e. typically < 15 m in length). This is particularly important when assessing the activity across the Development Area. Consultation has therefore, been important throughout the EIA process to determine the extent and distribution of activity by all vessels but particularly the < 15 m fleet. The <15m fleet are included in the other data sources used to inform this assessment, including the landing statistics and surveillance data.
22. The MMO collates VMS data for UK registered vessels by aggregating the number of position plots by general gear type (mobile or static) in a grid of sub-rectangles approximately 5.3 NM² (i.e. at a resolution of 200th of an ICES rectangle). This has been integrated with landings values, thereby providing both effort (hours fished) and value (£) for each sub-rectangle for mobile and static gears. These data have been analysed for a five-year period from 2011 to 2015.
23. Data limitations for VMS data are summarised in Section 10.5.2.

10.3.1.3 Surveillance Data

24. The UK has seven fisheries patrol vessels and four surveillance aircraft. Patrols are undertaken by Marine Scotland Compliance, Royal Navy Fisheries Patrol vessels and aircraft. UK surveillance aircraft are used to construct an on-going picture of fishing activity within the UK EEZ and to make effective use of patrol vessel activity by coordinated use of surveillance data. Surveillance data include fishing vessels of all lengths, thereby allowing complete fleet coverage. In addition, individual gear types are identified, which can be cross-referenced with VMS data and inshore fishery maps to identify fleet activity. Surveillance data alone do not give an accurate picture of the actual level of activity and have a number of limitations, primarily focused on the frequency and aerial coverage of patrols.
25. Data limitations for surveillance data are summarised in Section 10.5.2.

10.4 Relevant Consultations

26. As part of the EIA process, NnGOWL has undertaken consultations with various statutory and non-statutory stakeholders. A formal scoping opinion was requested from MS-LOT following submission of the Scoping Report, with the Scoping Opinion received on 8 September 2017. Ongoing consultation with stakeholders continued post-scoping and responses have been used to develop an appropriate methodology and parameters for assessment. Consultation with key commercial fisheries stakeholders has been ongoing in respect of the Originally Consented Project since 2009.
27. The Scoping Opinion identified those issues to be considered further within this Project EIA in respect of commercial fisheries; these are summarised in Table 10.3.
28. The issues identified during further Project EIA consultation are presented in Table 10.4.

Table 10.3: Summary of Scoping consultation relating to commercial fisheries.

Date and consultation phase	Consultation and Key Points Raised	Section where comment addressed
08/09/2017 Scoping Opinion – Scottish Ministers	The Scottish Ministers agreed that there is a requirement to update and review the commercial fisheries baseline as set out in the Scoping Report and advised that NnGOWL should take into account the information provided by stakeholders.	The baseline has been updated and is presented in Section 10.6 and Appendix 10.1

Date and consultation phase	Consultation and Key Points Raised	Section where comment addressed
	<p>The Scottish Ministers agreed that the embedded mitigation was adequate but advised that NnGOWL ensure that the most up to date information is used to inform the mitigation.</p>	<p>Consent Condition Commitments in Table 10.9 commits to developing a Commercial Fisheries Mitigation Strategy and engaging the Working Group throughout mitigation procedures.</p>
	<p>In addition, the Scottish Ministers advised that NnGOWL discuss with the SFF how best to ensure the proposed mitigation measures can be developed and agreed.</p>	
	<p>MSS recommended that a 1 kilometre (km) spacing be considered between structures and requested that NnGOWL provide information to support using less than this where it is necessary to do so.</p>	<p>Minimum spacing between turbines is 800 m, but expected to be greater than this for the majority of turbines. It is anticipated that a Design Specification and Layout Plan will be required (see section 10.7.2) and will justify the final layout based on further geotechnical and geophysical work taking account of physical constraints.</p>
	<p>The Scottish Ministers advised that there is a need for cable burial to be carried out in a way that ensures the seabed is left in a safe condition for fishing taking account of the most up to date baseline information.</p>	<p>Chapter 4: Project Description provides details of a range of cable protection measures that will be considered following further ground conditions investigation works.</p>
		<p>Furthermore, Consent Condition Commitments in Table 10.9 commits to developing a Cable Plan: setting out obligations relevant to commercial fisheries, including a cable burial assessment and over trawl surveys where cable protection is installed.</p>
	<p>The Scottish Ministers advised that there would be a need to consider anchorages and queuing of vessels.</p>	<p>Section 10.8.4 and Table 10.14 details the production for approval of a post-consent compliance Vessel Management Plan. This plan will consider anchorages and queuing of vessels as part of a wider vessel management strategy.</p>
	<p>MSS advised that the FLOWW guidance should be referenced in relation to disruption payments within the EIA Report.</p>	<p>Table 10.15 sets out proposed further mitigation, which commits to following FLOWW guidance in relation to justifiable disruption payments.</p>
	<p>The Scottish Ministers recommend the following projects are included in the cumulative impact assessment:</p> <ul style="list-style-type: none"> ▪ Worst case scenario of Inch Cape (2014 as consented) or Inch Cape (2017 scoping report) ▪ Worst case scenario of Seagreen Alpha and Bravo (2014 as consented) or Seagreen Phase 1 (2017 scoping report) ▪ Kincardine Wind Farm Area ▪ Forthwind Wind Farm Area (2016 consent) 	<p>Cumulative effects assessment is presented in Section 10.8.4 and includes all of these projects.</p>

Date and consultation phase	Consultation and Key Points Raised	Section where comment addressed
	<ul style="list-style-type: none"> ▪ Forthwind Offshore Wind Demonstration Project ▪ Offshore Renewable Energy Catapult Levenmouth ▪ The Scottish Ministers advised on including the following projects in the cumulative assessment of the impact on nomadic fishing fleets: ▪ European Offshore Wind Deployment Centre ▪ Hywind Scotland Pilot Park ▪ Blyth Wind Farm Area – 2 turbines ▪ Blyth Offshore Wind Demonstration Project – 15 turbines ▪ Beatrice Offshore Wind Farm Area ▪ Moray Offshore East Development ▪ Moray East Wind Farm Area – Alternative Design ▪ Moray Firth Offshore Wind Western Development Area ▪ Rampion Wind Farm Area 	
	<p>The Scottish Ministers advised that the scope of the Project EIA should consider the potential effects of sediments and smothering on the following commercial species: shellfish, scallops, nephrops, crabs and lobsters as raised at the scoping consultation meeting on the 27th June 2017.</p>	<p>MSS and the Scottish Ministers agreed that the effects of increased suspended sediment and smothering could be scoped out of the EIA as the Project is not considering the use of Gravity Base Structures, see Chapter 7: Fish and Shellfish Ecology.</p>
	<p>The Scottish Ministers noted that further information was been provided to update the baseline and advised that NnGOWL include this with the information already identified to inform the update of the baseline data in relation to commercial fisheries.</p> <p>In addition, the Scottish Ministers advised that NnGOWL validate the data from the fishing industry to discuss with the SFF how this could best be done.</p>	<p>Baseline data was ground-truthed during consultation with local fisheries associations and organisations.</p>
<p>08/09/2017 Scoping Opinion – Scottish Fishermen's Federation</p>	<p>The SFF agreed with the Scoping Report that the commercial fisheries baseline should be updated. SFF highlighted that it is necessary to assess scallop activity over a ten-year cycle to gain a true picture of the fishery.</p>	<p>The baseline in Appendix 10.1: Commercial Fisheries Technical Report provides long-term trends for key commercial species, including scallop landings from 2003 to 2015.</p>

Date and consultation phase	Consultation and Key Points Raised	Section where comment addressed
	The SFF recommend that NnGOWL use the Commercial Fisheries Working Group to verify the updated baselines.	Due to varying timelines for the Firth and Tay Projects, namely NnG, Inch Cape and Seagreen, it was not possible for the Commercial Fisheries Working Group to be reactivated prior to writing of the baseline description. Instead, baseline data was ground-truthed during consultation with local fisheries associations and organisations. The CFWG will be reactivated by the Firth and Tay Developers following submission of this EIA Report.
	The SFF requested that the Commercial Fisheries Working Group be the recognised method for developing and agreeing all relevant mitigation needed.	This is detailed within Section 10.7.2 in Table 10.9.
	The SFF raised concerns about cable burial and the need to take into account the safety of fishing vessels in relation to state of the seabed post burial. The SFF noted some research carried out by Xodus in relation to the Caithness to Moray cable project and recommended incorporating this information into the EIA for the Project where relevant.	The impact assessment presented in Section 10.8 assesses snagging risk related to different gear types and operations.
	<p>The SFF noted the need for the potential impacts from both the Wind Farm and Offshore Export Cable to be included in a cumulative assessment with other projects. This includes taking into account the volume of scour protection to be used and all options for cable protection. It was recommended that the route of the cables be considered in the assessment of potential impacts on commercial fisheries.</p> <p>The SFF also note the need to consider Forth Ports projects.</p>	Cumulative effects assessment includes both wind farms and export cable routes and is presented in Section 10.8.4.
08/09/2017 Scoping Opinion – The Under 10m Association	The Under 10m Association noted that the impact on all inshore fishing vessels must be considered regardless of their size and that the impact on vessels less than 15m in length was not fully considered within the Scoping Report.	The baseline in Section 10.6 and Appendix 10.1: Commercial Fisheries Technical Report provides detailed assessment for vessels under 15 m in length.
	The Under 10m Association raised concerns about cable burial and the need to take into account the safety of fishing vessels in relation to state of the seabed post burial.	The impact assessment presented in Section 10.8 assesses snagging risk related to different gear types and operations.
	The Under 10m Association noted that there has been additional consents granted to wind farms in the area and the cumulative effect of these and the potential impact for displacement of fishing vessels should be considered.	Cumulative effects assessment is presented in Section 10.8.4.

Date and consultation phase	Consultation and Key Points Raised	Section where comment addressed
08/09/2017 Scoping Opinion – East Lothian Council	East Lothian Council recommended that the fisheries baseline information include what fish are being targeted and where incorporating information provided by fishery stakeholders and commercial landings data. These data should then be used to assess the impact of the Project on the industry.	The baseline in Section 10.6 and Appendix 10.1 includes data from MMO iFISH database, which correlates landings declarations with sales notes. In addition, consultation with local fisheries associations and organisations provided further context and detail that informed the baseline description.
27/06/2017: Scoping consultation Face to face meeting with: MS-LOT and SFF	Confirmation that data sources within scoping report are the best available Discussion on methodology and impact assessment confirming that all impacts remained scoped into the assessment.	Section 10.3 and Table 10.2 provide details on the data sources. Section 10.5 provides impact assessment methodology.

Table 10.4: Summary of EIA consultation relating to commercial fisheries.

Date and consultation phase / type	Consultation key points raised	Section where comment addressed
26/07/2017: EIA consultation Face to face meeting with: <ul style="list-style-type: none"> ▪ Fife Fishermen’s Association ▪ Fife Creel Association ▪ Pittenweem Fishermen’s Mutual Association ▪ Under 10m Association 	<p>Raised concern that the Original ES did not present data or information on vessels under 15m in length.</p> <p>Requested long-term trends be considered.</p> <p>Requested Fisheries Liaison Officer be established.</p> <p>Highlighted range of fishing grounds that are targeted by potting vessels in the area.</p> <p>Concern over loss of fishing grounds and access due to Offshore Wind Farm and Offshore Export Cable.</p>	<p>The baseline in Section 10.6 and Appendix 10.1 provides detailed assessment for under 15m vessels.</p> <p>Long-term trends are presented in Appendix 10.1: Commercial Fisheries Technical Report.</p> <p>It is anticipated that NnGOWL will be required to procure the services of a Fisheries Liaison Officer as a condition of any future consents granted for the Project (See section 10.7.2).</p> <p>Potting fishing grounds map has been updated and presented in Figure 10.6 (Volume 2).</p> <p>The impact assessment in Section 10.8 provides assessment of loss of fishing grounds and displacement leading to gear conflict.</p>

Date and consultation phase / type	Consultation key points raised	Section where comment addressed
<p>26/07/2017: EIA consultation Face to face meeting with:</p> <ul style="list-style-type: none"> ▪ Dunbar Fishermen’s Association ▪ Including 25 fishermen based at Dunbar, St. Abbs and Cove. 	<p>Raised concern with time period of data in original assessment and data provided at consultation meeting. Corroborated that fishing maps provided good representation for demersal trawl activity. Corroborated that all landings were recorded through the RBS system.</p> <p>Raised low landings into Dunbar, but confirmed this is likely to be due to landings by Dunbar vessels being made into Port Seton and elsewhere. Concern over loss of fishing grounds and access specifically due to the Offshore Export Cable.</p>	<p>At the time of assessment, the most recent datasets by ICES rectangle was 2016. Therefore 2012 to 2016 represents the most recent five-year period. Data by port was also assessed for 2016 in Section 10.6 and Appendix 10.1</p> <p>Face-to-face meetings facilitated collation of qualitative information on historic and recent trends since last data set was published.</p> <p>The impact assessment in Section 10.8 provides assessment of loss of fishing grounds.</p>
<p>01/08/2017: EIA consultation Face to face meeting with:</p> <ul style="list-style-type: none"> ▪ Anglo-Scottish Fishermen’s Association ▪ Eymouth Fishermen’s Association 	<p>Corroborated that fishing maps provided good representation for demersal trawl activity. Corroborated that all landings were recorded through the RBS system.</p> <p>Concern over loss of fishing grounds and access specifically due to the Offshore Export Cable.</p>	<p>The impact assessment in Section 10.8 provides assessment of loss of fishing grounds.</p> <p>Embedded mitigation in Section 10.7.1 commit to over trawl-ability trawls to ensure it is safe to resume fishing.</p>
<p>02/08/2017: EIA consultation Face to face meeting with:</p> <ul style="list-style-type: none"> ▪ Scottish Fishermen’s Federation (SFF) 	<p>Provided insight into fishing grounds and target species.</p> <p>Raised concern over trawl-ability of areas post construction.</p>	<p>Information given has informed the baseline section 10.6.</p> <p>Embedded mitigation in Section 10.7.1 commit to over trawl-ability trawls to ensure it is safe to resume fishing.</p>
<p>08/08/2017: EIA consultation Face to face meeting with:</p> <ul style="list-style-type: none"> ▪ North Berwick Fishermen’s Association 	<p>Confirmed that fishing vessels from North Berwick do not extend their operational range to the Development Area and so expect little impact in terms of loss of ground.</p> <p>Noted potential for displacement into grounds currently fished by North Berwick potting vessels.</p>	<p>The impact assessment in Section 10.8 provides assessment of loss of fishing grounds and displacement leading to gear conflict.</p>
<p>16/08/2017: EIA consultation Face to face meeting with:</p> <ul style="list-style-type: none"> ▪ St Andrews Fishermen’s Association 	<p>Raised concern over displacement leading to gear conflict within grounds typically targeted by St Andrews vessels.</p>	<p>The impact assessment in Section 10.8 provides assessment of displacement leading to gear conflict.</p>

Date and consultation phase / type	Consultation key points raised	Section where comment addressed
24/08/2017: EIA consultation Face to face meeting with: <ul style="list-style-type: none"> ▪ Scottish Creel Fishermen’s Federation 	<p>Discussed member coverage across East, North and West coast of Scotland.</p> <p>Raised concern over gear conflict associated with squid demersal trawl fishery.</p> <p>Considers potting vessels would be able to operate within a wind farm.</p>	<p>The impact assessment in Section 10.8 provides assessment of displacement leading to gear conflict.</p> <p>The impact assessment in Section 10.8 assumes a level of co-existence between potters and the Offshore Wind Farm.</p>
July – August: EIA consultation Email and telephone correspondence: <ul style="list-style-type: none"> ▪ North and East Coast Inshore Fisheries Group (IFG) 	<p>Declined direct consultation. Provided contacts for members of North & East Coast IFG.</p>	<p>This table provides details of the consultation undertaken.</p>
July – August: EIA consultation Email and telephone correspondence: <ul style="list-style-type: none"> ▪ Scallop Association ▪ Scottish White Fish Producer’s Association ▪ Scottish White Fish Producers’ Association-Inshore ▪ Arbroath and Montrose Static Gear ▪ Arbroath non-affiliated fishermen 	<p>No replies were received from these organisations. However, these organisations either are members of the SFF or are in communication with the SFF (e.g. Arbroath consultees).</p> <p>The SFF have agreed to provide any feedback on behalf of these organisations.</p>	<p>N/A</p>
July – August: EIA consultation Email and telephone correspondence: <ul style="list-style-type: none"> ▪ Aberdeenshire Inshore ▪ North east Creel and Line 	<p>No replies were received from these organisations.</p> <p>The SFF indicate that fishermen from these organisations are unlikely to fish as far south as the Development Area.</p>	<p>N/A</p>
July – August: EIA consultation Email and telephone correspondence: <ul style="list-style-type: none"> ▪ Scottish Pelagic Fishermen’s Association 	<p>Provided confirmation that there are no active pelagic vessels operating in the Forth and Tay.</p>	<p>This detail has informed the baseline in Section 10.6 and the impact assessment in Section 10.8.</p>
July – August: EIA consultation Email and telephone correspondence <ul style="list-style-type: none"> ▪ Port Seton Fishermen’s Association 	<p>Organised face-to-face meetings were unable to go-ahead. No response received to date on questions and information submitted to Port Seton Fishermen’s Association.</p>	<p>N/A</p>

10.5 Impact Assessment Methodology

29. This assessment considers the potential impacts associated with the construction, operation and decommissioning of the Project and the effects on commercial fisheries. The impact assessment process and methodology follows the principles and general approach outlined in Chapter 6: EIA Methodology. The methodology and parameters assessed also take into account issues identified through consultation with stakeholders as detailed in (Section 10.4) and the understanding of baseline conditions informed by the data sources referenced in (Section 10.3).

30. The Project Description (Chapter 4) and the Project activities for all stages of the Project life cycle (construction, operation (including maintenance) and decommissioning) have been assessed against the environmental baseline to identify the potential interactions between the Project and the environment. These are known as the potential impacts and are then assessed to determine a level of significance of effect upon the receiving environment.

10.5.1 Assessment and Assignment of Significance

31. The sensitivities of commercial fishing fleets are defined by both their potential vulnerability to an impact from the Project, their recoverability and value or importance of the receptor. The definitions of sensitivity terms relating to commercial fishing fleets are given in Table 10.5.

Table 10.5 Sensitivity/ importance of the receptor

Receptor sensitivity / importance	Description / justification
High	Receptor is generally vulnerable to impacts that may arise from the project and recoverability is slow and/or costly. Low levels of alternative fishing grounds are available and/or fishing fleet has low operational range.
Medium	Receptor is somewhat vulnerable to impacts that may arise from the project and has moderate levels of recoverability. Moderate levels of alternative fishing grounds are available and/or fishing fleet has moderate operational range.
Low	Receptor is not generally vulnerable to impacts that may arise from the project and/or has high recoverability. High levels of alternative fishing grounds are available and/or fishing fleet has large to extensive operational range; fishing fleet is adaptive and resilient to change.
Negligible	Receptor is not vulnerable to impacts that may arise from the project and/or has high recoverability. Extensive alternative fishing grounds available and/or fishing fleet is highly adaptive and resilient to change.

32. The magnitude of impact is defined by a series of factors including the spatial extent of any interaction, the likelihood, duration, frequency and reversibility of a potential impact. The definitions of the levels of magnitude used in this assessment in respect of commercial fisheries are described in Table 10.6

Table 10.6 Magnitude of the impact

Magnitude of impact	Description (adverse effects)	Description (beneficial effects)
High	Loss of resource and/or quality and integrity of resource; severe damage to key characteristics, features or elements.	Large scale or major improvement or resource quality; extensive restoration or enhancement; major improvement of attribute quality.
Medium	Loss of resource, but not adversely affecting integrity of resource; partial loss of/damage to key characteristics, features or elements.	Benefit to, or addition of, key characteristics, features or elements; improvement of attribute quality.
Low	Some measurable change in attributes, quality or vulnerability, minor loss of, or alteration to, one (maybe more) key characteristics, features or elements.	Minor benefit to, or addition of, one (maybe more) key characteristics, features or elements; some beneficial impact on attribute or a reduced risk of negative impact occurring.

Magnitude of impact	Description (adverse effects)	Description (beneficial effects)
Negligible	Very minor loss or detrimental alteration to one or more characteristics, features or elements.	Very minor benefit to, or positive addition of one or more characteristics, features or elements.
No change	No loss or alteration or characteristics, features or elements; no observable impact in either direction.	

33. In assessing the magnitude of the impact, the value and vulnerability of the receptor, i.e. the fishing fleet under assessment, together with the reversibility of the impact are considered. Due to the range in scale, value (in terms of both landings and income / profit) and operational practises, within the commercial fishing fleets assessed, specific economic criteria were not set for defining value within the categories of high, medium, low, negligible or no change. Instead, these classifications were based on judgement informed from the baseline characterisation and consultation with the industry.
34. The magnitude of the impact is correlated against the sensitivity of the receptor to provide a level of significance. For the purposes of the commercial fisheries assessment, any effect that is considered to be of moderate or major significance, are considered to be potentially significant in EIA terms, and therefore may consider further consideration and / or mitigation. Any effect that is minor or below is not considered to be significant.

Table 10.7: Significance of potential effects

		Magnitude			
		High	Medium	Low	Negligible
Sensitivity	High	Major	Major	Moderate	Minor
	Medium	Major	Moderate	Minor	Negligible
	Low	Moderate	Minor	Minor	Negligible
	Negligible	Minor	Negligible	Negligible	Negligible

10.5.2 Uncertainty and Technical Difficulties Encountered

35. The following sections summarise limitations within the datasets analysed.

10.5.2.1 Landings Statistics

36. Limitations of landings data include the spatial size of ICES rectangles (e.g. the surface area of the Wind Farm Area is 105 km², which is 4% of the surface area of ICES rectangle 41E7). This can misrepresent actual activity across the Wind Farm Area and care is therefore required when interpreting these data. A further limitation of landings data is the potential for under-reporting as some catches may fall below the acceptable limit as defined within the UK RBS (i.e. when purchases of first sale fish direct from a fishing vessel are wholly for private consumption or less than 30 kg is bought per day). However, industry consultation across the Angus, Fife, East Lothian and Scottish Border regions confirmed that all landings are recorded through the RBS system, which is correlated with landing declarations within the MMO iFISH database.
37. Data limitations were managed by ensuring accurate interpretation of the data and a clear understanding of its scope. Consultation was fundamental to understanding the validity of data, enabling appropriate interpretation and to ground-truth landings data.

10.5.2.2 VMS Data

38. Limitations of VMS data are primarily focused on the coverage being limited to vessels ≥ 15 m in length and therefore not representing all inshore activity, which is dominated by vessels that are under 10 m in length.

10.5.2.3 Surveillance Data

39. UK surveillance aircraft are used to construct an ongoing picture of fishing activity within the UK EEZ and to make effective use of patrol vessel activity by coordinated use of surveillance data. These data cannot be considered to give a complete picture of the actual level of activity and have limitations, including the following key aspects:

- Patrol effort by Marine Scotland Compliance, Royal Navy Fisheries Patrol Vessels and patrol aircraft are optimised for enforcement purposes and not collection of sightings data. Areas with fewer fisheries enforcement issues are therefore likely to be visited less often and result in lower data confidence;
- Surveillance data are only indicative of areas where fishing activities occur, as there is no continuous monitoring of activities;
- Surveillance data present a snapshot of activity in an area and it cannot be assumed that if no vessels have been sighted then no fishing takes place; and
- Vessels fishing at night would likely remain undetected.

10.6 Baseline Description

10.6.1 Commercial Fisheries Regional Study Area

40. A full baseline characterisation is provided within Appendix 10.1, which should be read in conjunction with this chapter. This baseline description provides an overview of the key fisheries in the Local and Regional Study Areas, as well as specifically across the Development Area.
41. The average annual landings across the regional commercial fisheries study area (Illustration 10.1) show the highest quantity of catch (tonnes) and value of catch (£) is from ICES rectangle 41E7.

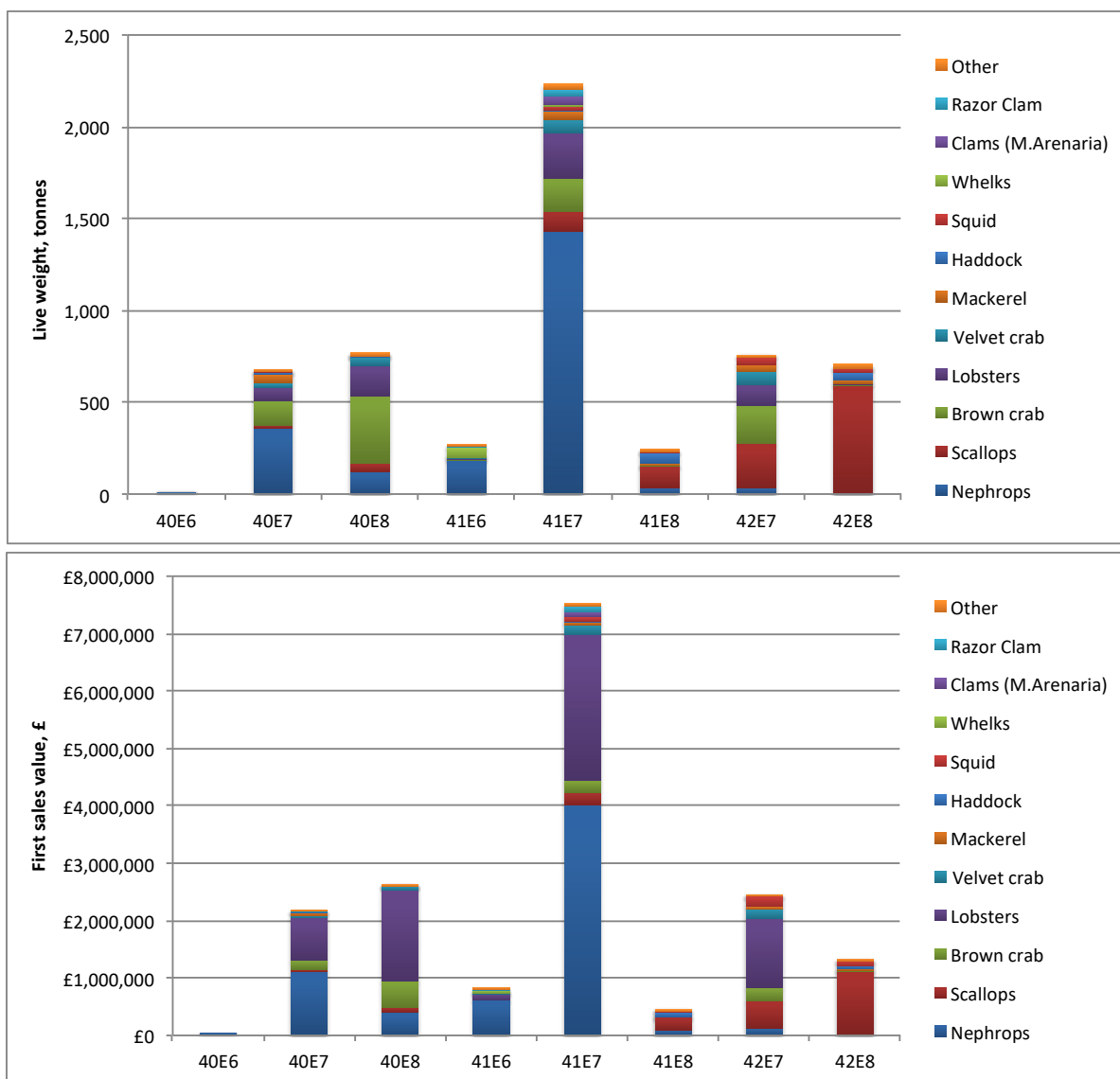


Illustration 10.1: Average annual live weight, tonnes (top) and first sale value (£) (bottom) of all species landed by UK vessels from the regional commercial fisheries study area indicating ICES rectangle and species (based on a five-year average from 2011 to 2015). (Data source: MMO, 2017).

- 42. Nephrops (*Nephrops norvegicus*), known as langoustine, prawn and Norway lobster, hereon referred to as nephrops, and lobster (*Homarus gammarus*) represent the most commercially important species for inshore ICES rectangles 40E6 to 41E7 (Figure 10.4 (Volume 2)), while scallops (*Pecten maximus*) become increasingly prominent in landings from 41E8, 42E7 and 42E8. In 42E8 scallops account for 83% of the total value landed from this ICES rectangle.
- 43. The value of catch landed by vessels that are 10 m and under in length represents 47% of the total landings from the Regional Study Area, with 53% taken by vessels over 10 m in length.
- 44. Most landings from E7 ICES rectangles are made by vessels 10 m and under in length (Illustration 10.2), while most landings from E8 ICES rectangles are made by vessels over 10 m in length. Given the operational ranges of vessels under 10 m in length, it is to be expected that their effort is higher in inshore waters, rather than beyond 12 NM.

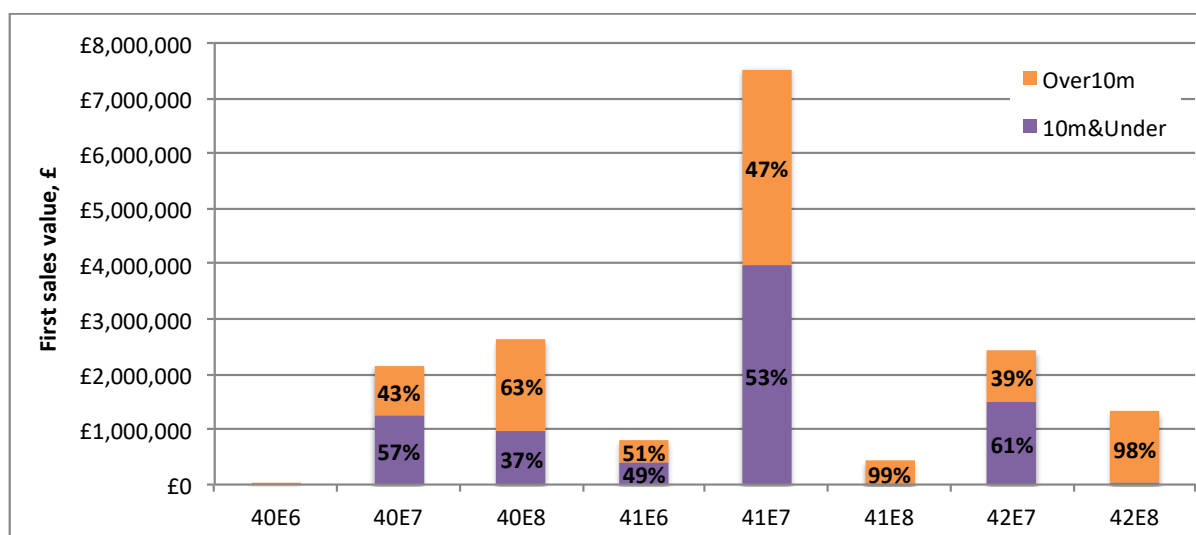


Illustration 10.2: Average annual first sale value (£) of all species landed by UK vessels from the regional commercial fisheries study area indicating ICES rectangle and vessel length category (based on a five-year average from 2011 to 2015). (Data source: MMO, 2017).

10.6.2 Wind Farm Area

45. The Wind Farm Area is located within ICES rectangle 41E7. In terms of spatial overlap, the Wind Farm Area is 105 km² and covers approximately 4% of ICES rectangle 41E7. It cannot be assumed that the landings from the Wind Farm Area are 4% of the total value landed from 41E7, as this does not take account of specific fishing grounds that may be present within the Wind Farm Area, or elsewhere in 41E7. Nevertheless, it provides useful context for the detailed landings described below. Unless otherwise stated, all average annual figures are based on a five-year average from 2011 to 2015
46. An average annual value of £7.5 million is landed from ICES rectangle 41E7, with 97% of landings (£7.3 million) taken by Scottish registered vessels.
47. Most landings from 41E7 are taken by vessels that are 10 m and under in length (53%, Illustration 10.2), with the remaining 47% landed by vessels >10 m. Given the fleet structure as outlined in Appendix 10.1, a significant proportion of landings by the over 10 m fleet is likely to be by vessels that are <15 m in length.
48. Five-year annual trends for landings from 41E7 are presented in Illustration 10.3 by first sales value and weight, tonnes. The most important commercial species landed from 41E7 is nephrops, with annual values ranging from £2.6 to £5.2 million and an average annual value of £4 million. A drop in nephrops landings is noted from 2012 to 2013, but significant growth is seen in 2014, while the 2015 value is closer to the annual average, at £4.4 million.
49. Lobster landings have also fluctuated, growing from 2012 to 2014, with a small drop in 2015; annual value ranges from £2.1 to £2.9 million, with an average annual value of £2.5 million.
50. Brown crab and velvet crab have an average annual value of £211,392 and £154,973 respectively. Brown crab landings equate to an average of 182 tonnes (compared to lobster at 245 tonnes) but they are nine times lower in value than lobster, which is reflected in the much lower first sales value. Brown crab landings have remained consistent across the five-year period, while a continuous decline is noted in velvet crab landings, both in terms of weight and value.
51. Scallop landings increased from 2011 to 2012 and have remained relatively consistent since then, with an average annual weight of 108 tonnes, worth £208,599.
52. Other notable shellfish species are razor shell (*Ensis ensis*) (£96,734 annually) and soft-shelled clam (*Mya arenaria*) (£81,719 annually), which are both landed by hydraulic dredge.

53. Small quantities of squid are taken by demersal trawl (£84,876 annually), and potting vessels that also deploy hook and lines to catch mackerel (£54,189 annually).

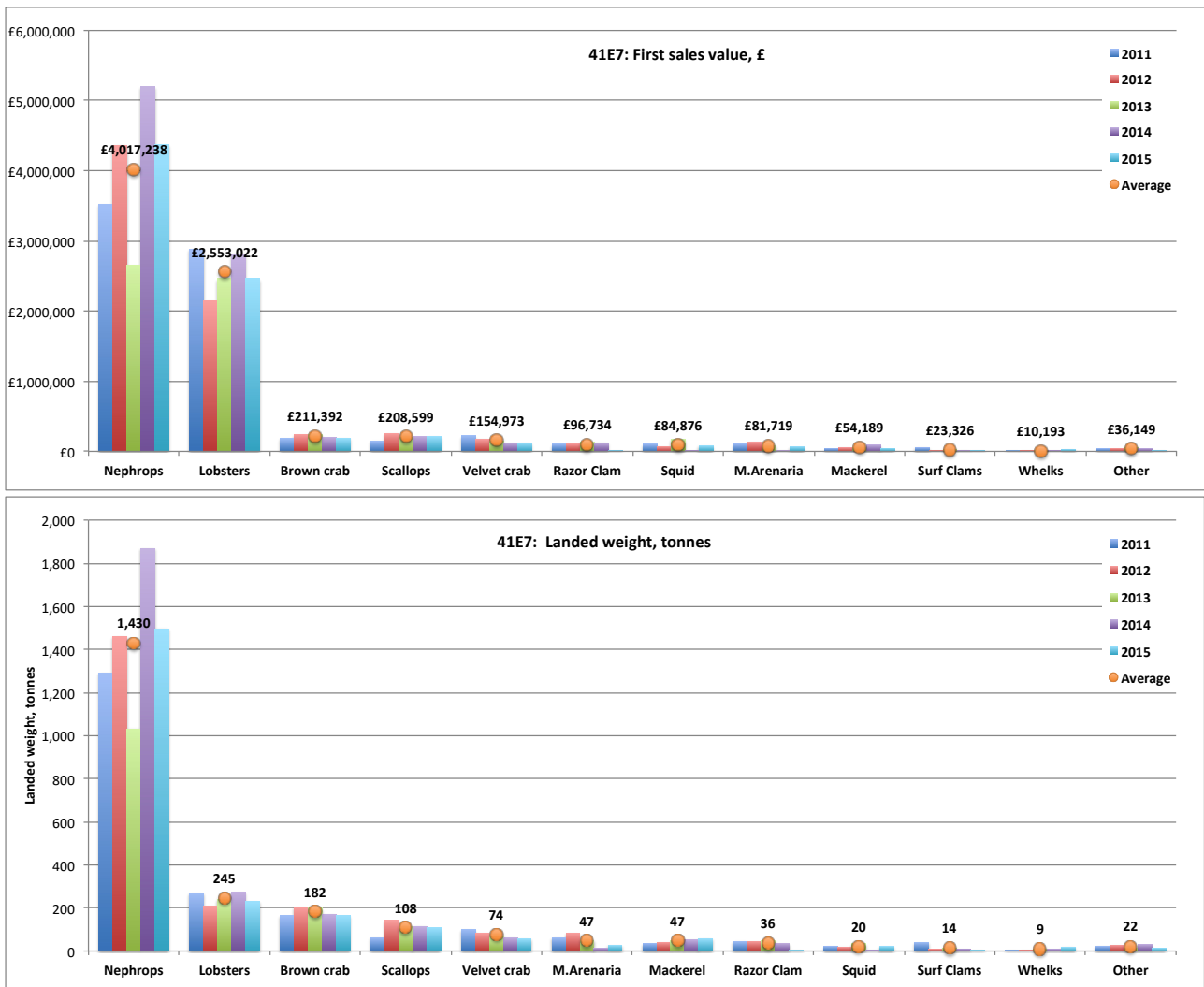


Illustration 10.3: Annual landings by UK registered vessels from ICES rectangles 41E7 by species and first sales value (top) and weight, tonnes (bottom) from 2011 to 2015, (Data source: MMO, 2017)

- 54. The annual first sales value of species landed from 41E7 are shown in Illustration 10.4 by method of capture and vessel length category and based on average annual values from 2011 to 2015). Lobster, brown crab and velvet crab are landed by creels, almost entirely by vessels 10 m and under in length (95% by value).
- 55. Nephrops are landed by demersal trawl, primarily by vessels over 10 m in length (76% by value), but also by vessels under 10 m in length (24%). There is no direct targeting of nephrops using creels.
- 56. The fishing fleets in terms of gears used to target different species and vessel length categories have remained consistent for 2016, as presented in Illustration 10.5, meaning that no new specific fisheries have emerged in 2016. It should be noted that 2016 data has not been ground-truthed or verified through industry consultation, but provides the most recent dataset available. The value of nephrops landed from 41E7 in 2016 totalled £4.4 million, which is above the five-year annual average seen during 2011 to 2015, but below the peak in 2014.
- 57. Similarly, lobster landings from 41E7 were higher in 2016 (at £2.8 million) compared to the annual average, but consistent with peaks seen in 2011 and 2014. Scallop landings were also higher in 2016 (at £400,000) compared to the annual average of £208,000 from 2011 to 2015. All other species have landings values consistent with the annual averages seen for 2011 to 2015.

58. It is therefore considered that 2016 data does not change the baseline assessment presented for 2011 to 2015 for fisheries operating in 41E7.

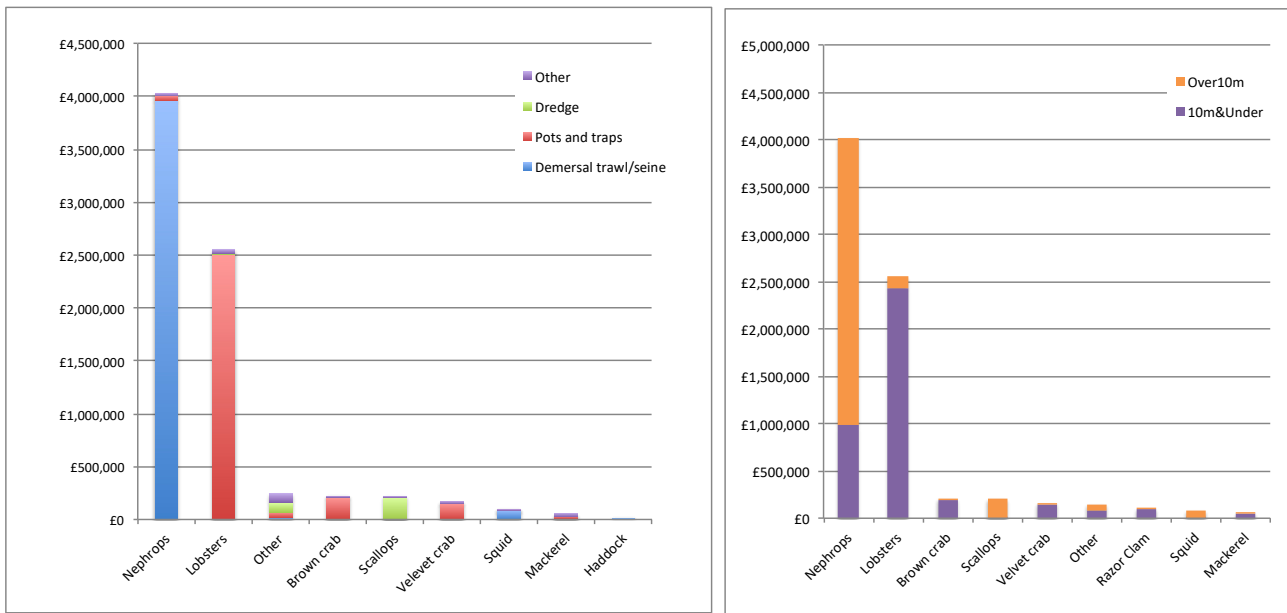


Illustration 10.4: Average annual value of species landed by UK vessels from ICES rectangle 41E7 indicating gear type (left) and vessel length category (right) (based on five-years' data from 2011 to 2015) (Data source: MMO, 2017)

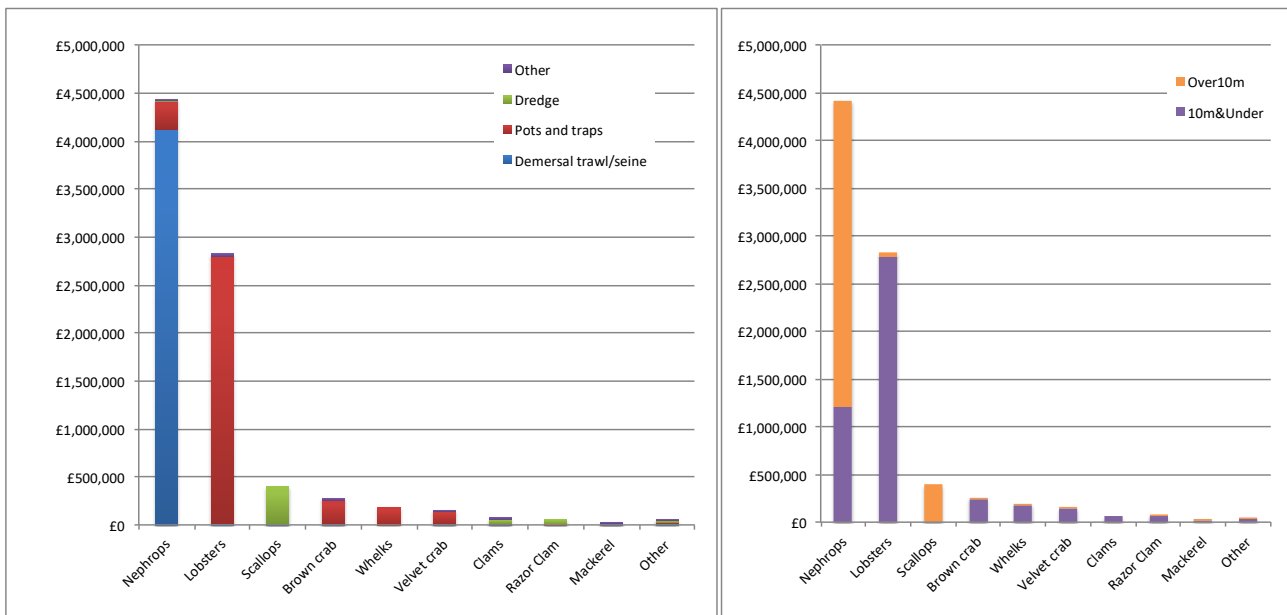


Illustration 10.5: Value of species landed by UK vessels from ICES rectangle 41E7 indicating gear type (left) and vessel length category (right) in 2016 (Data source: MMO, 2017)

59. Long-term trends in scallop landings from 41E7 show a significant spike in 2007, when approximately 560 tonnes were landed, compared to the average of 190 tonnes (see Appendix 10.1). This is characteristic of scallop fisheries where nomadic vessels can target a wide range of grounds, focusing effort on specific locations on a rolling 7-10 year basis.
60. The fishing effort (hours fished) within ICES rectangle 41E7 for demersal trawl and potting vessels is presented in Illustration 10.6 from 2011 to 2015 indicating the vessel length category. The EU DCF database reports on vessel lengths in three categories: under 10 m, 10 to 15 m and over 15 m in length (this contrasts with the MMO landings data, which reports in two categories).

61. Fishing effort for both demersal trawl and potting was relatively consistent from 2011 to 2013. A significant increase in effort occurs in 2014 for both gear types, which is maintained in 2015. For demersal trawl and potting, this effort increase is specifically pronounced for the under 10 m fleet.

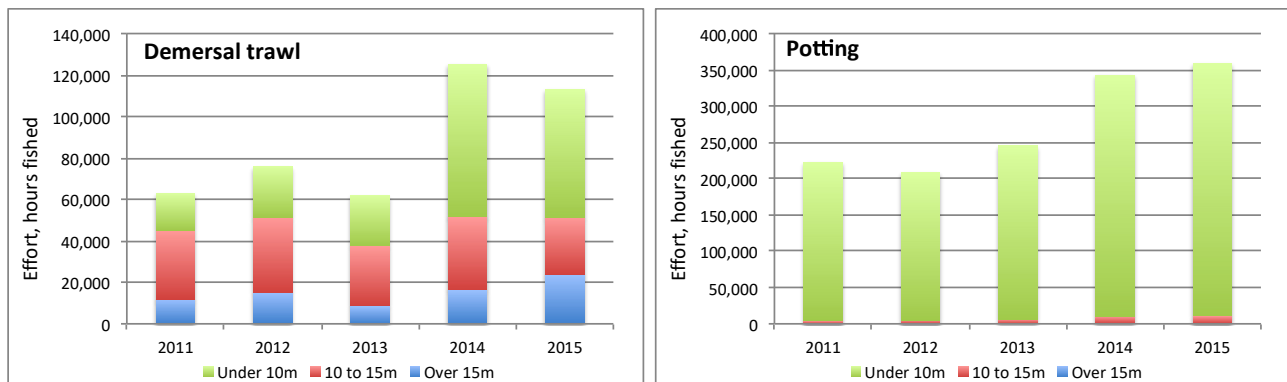


Illustration 10.6: Effort, hours fished, by demersal trawl and potting vessels in ICES rectangle 41E7 from 2011 to 2015, indicating length of vessel (Data source: EU DCF, 2017).

62. Industry consultation undertaken in 2010 has been extremely helpful in mapping the representative fishing grounds that are targeted by the nephrops demersal trawl vessels (Figure 10.4 (Volume 2)) and lobster and crab potting vessels (Figure 10.6 (Volume 2)).
63. Nephrops grounds in this region are typically targeted from 0.5 NM from shore, out to 20 NM. Fishing grounds are noted to occur across the Development Area. However, consultation, VMS data for >15 m demersal trawlers (Figure 10.5 (Volume 2)) and surveillance data (Figure 10.7 (Volume 2)), indicates that effort and landings are primarily focused on grounds inshore from the Wind Farm Area, running parallel to the coast.
64. Specific potting grounds (identified by a sample of individual fishermen), and general potting grounds (identified by fisheries representatives) indicate a large area of operation for the eastern and southeast Scottish potting fleet. It is understood that potting vessels routinely deploy gear within the Wind Farm Area.
65. Industry consultation with fishermen's associations across the east and southeast coast of Scotland consistently communicated that no gear conflict is experienced during commercial fisheries operations. There are some voluntary codes of practice, e.g. related to how potting gear is set and marked, but ultimately the approach is one of common sense whereby potters avoid key trawling grounds and trawlers avoid areas where potting gear is set. Furthermore, the key target species inhabit very different seabed habitats with nephrops linked to fine muddy benthos and lobster found in rocky, hard substrate and crevices.

10.6.3 Offshore Export Cable Corridor

66. The Offshore Export Cable Corridor is routed through ICES rectangle 40E7 and 41E7. In terms of spatial overlap, the Offshore Export Cable Corridor is 43 km in length and 300 m wide, equating to an area of 12.9 km², which overlaps with approximately 0.39% of ICES rectangles 40E7 and 41E7. In terms of spatial overlap for ICES rectangles individually, the Offshore Export Cable Corridor overlaps with approximately 1.43% of 40E7 and 0.27% of 41E7.
67. An average annual value of £9.7 million is landed from 41E7 and 40E7, with 96% of landings (£9.3 million) taken by Scottish registered vessels. Most landings are taken by vessels that are 10 m and under in length (54%), with the remaining 46% landed by vessels >10 m in length. It should be noted that, given the fleet structure as outlined in Appendix 10.1, a significant proportion of landings by the over 10 m fleet is likely to be by vessels that are <15 m in length.

- 68. Five-year annual trends for landings from 40E7 and 41E7 are presented in Illustration 10.7 by first sales value and weight, tonnes. The most important commercial species to be landed from 40E7 and 41E7 is nephrops, with annual value ranges from £3.6 to £6.3 million and an average annual value of £5.1 million. The trends for nephrops landings across the five-year period are consistent with those described for the Wind Farm Area as they occur within the same ICES rectangle, 41E7.
- 69. Lobster are the next most commercially important species with a range in annual value from £2.9 to £3.6 million and an average annual value of £3.3 million.

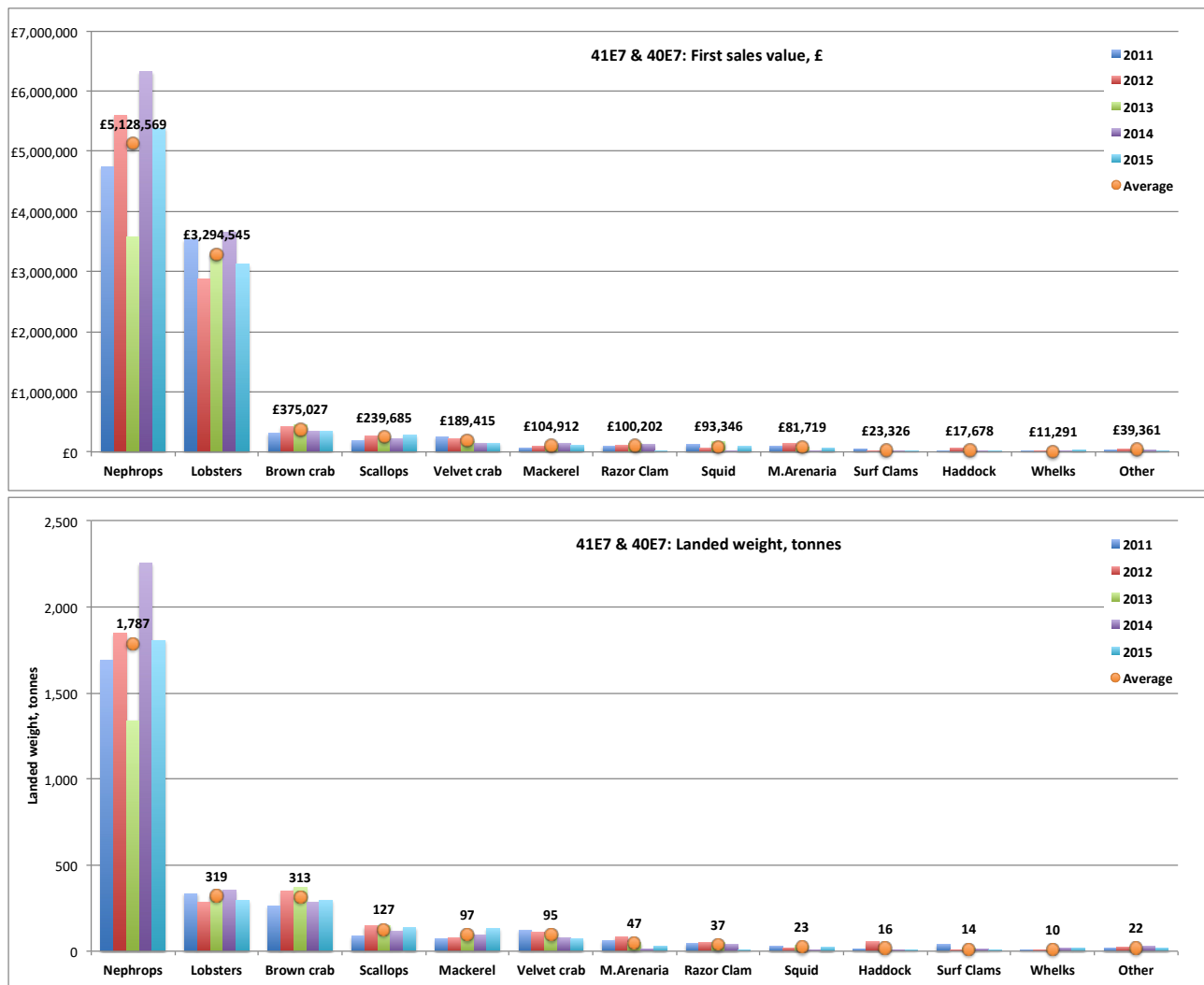


Illustration 10.7: Annual landings by UK registered vessels from ICES rectangles 41E7 and 40E7 by species and first sales value (top) and weight, tonnes (bottom) from 2011 to 2015, (Data source: MMO, 2017)

- 70. Landing statistics by method of capture and vessel length category are presented in full in Appendix 10.1, for both 2011 to 2015 and 2016, and reflect the findings reported for 41E7 in Illustration 10.4.
- 71. The fishing effort (hours fished) within ICES rectangles 40E7 and 41E7 for demersal trawl and potting vessels are presented in full in Appendix 10.1, and reflect the findings reported for 41E7 in Illustration 10.6.
- 72. Maps based on industry consultation show nephrops demersal trawl grounds (Figure 10.4 (Volume 2)) and lobster and crab potting grounds (Figure 10.6 (Volume 2)) occur across the entirety of the Offshore Export Cable Corridor. Consultation pointed to more focused demersal trawl grounds, running parallel to the coast and across the Offshore Export Cable Corridor. Potting around the area that overlaps the Offshore Export Cable Corridor is generally more exploratory. This is consistent with

the message from consultation of no gear conflict, as the two different fishing methods would be expected to have limited spatial overlap.

73. The 2015 VMS data (Figure 10.5 (Volume 2)) shows considerable effort and value by the demersal trawl ≥ 15 m vessels across the Offshore Export Cable Corridor. A specific hot spot of activity is noted from half way along the Offshore Export Cable Corridor running towards the Wind Farm Area. This is corroborated by industry consultation, which cited the areas inshore from the Wind Farm Area as being important nephrops grounds.
74. The VMS for dredging activity shows some activity in the inshore areas of the Offshore Export Cable Corridor, immediately adjacent to the shore out to approximately 4 NM. More pronounced effort is noted in areas northwest, east and southeast from the Offshore Export Cable Corridor.

10.6.4 Development of Baseline Conditions without the Project

75. Commercial fisheries patterns change and fluctuate based on a range of natural and management controlled factors. This includes, but may not be limited to, the following:
 - **Stock abundance:** fluctuation in the biomass of individual species stocks in response to status of the stock, recruitment, natural disturbances (e.g. due to storms, sea temperature etc.), changes in fishing pressure etc.;
 - **Fisheries management:** including changes in Total Allowable Catches (TACs) leading to the relocation of effort, and/or an overall increase/decrease of effort, changes to Minimum Landing Size (MLS), changes to gear technology etc.;
 - **Environmental management:** including the potential restriction of certain fisheries within protected areas;
 - **Improved efficiency and gear technology:** with fishing fleets constantly evolving to reduce operational costs e.g. by adapting gear to have a lighter footprint;
 - **Sustainability:** with seafood buyers more frequently requesting certification of the sustainability of fish and shellfish products, such as the Marine Stewardship Council certification, industry is adapting to improve fisheries management and wider environmental impacts; and
 - **Markets:** commercial fishing fleets respond to market prices by focusing effort on higher value target species when prices are high and markets in demand.
76. The variations and trends in commercial fisheries activity is an important aspect of the baseline assessment, and forms the principle reason for assessing five years of baseline data. In some cases, a longer period may be considered in the baseline to ensure long-term trends inform the assessment, either as a result of fisheries stakeholder's requests, or to reflect natural cycles in specific fisheries such as scallop (see Appendix 10.1 for long-term trends in nephrops, lobster, brown crab and scallop landings). Therefore, for commercial fisheries, the future baseline scenario would be expected to be fluctuate within the ranges that are represented within the current baseline.

10.6.5 Summary of fleets to be assessed

77. For this assessment, the commercial fisheries fleets have been defined as:
 - Potting vessels targeting lobster, brown crab and velvet crab with creels, and seasonally deploying hook and lines to target mackerel;
 - Demersal otter trawling vessels targeting nephrops and (seasonally) squid, using single or twin trawl;
 - Scallop dredging vessels targeting scallop; and
 - Other (hydraulic) dredging vessels targeting razor shell and soft-shelled clam.

10.7 Design Envelope – Worst Case Design Scenario

78. The Application is for the construction, operation and decommissioning of an offshore wind farm with a maximum output of 450 MW, comprising of a maximum of 54 turbines. The assessment scenarios identified in respect of commercial fisheries have been selected as those having potential to represent the greatest effect on an identified receptor based on the design envelope described in Chapter 4: Project Description. The worst-case design scenarios are set out in Table 10.8 and drawn from the project details set out in Chapter 4: Project Description.

Table 10.8: Worst-case design envelope scenario assessed

Potential Impact	Worst-Case Design Scenario	Justification
Construction		
<p>Wind Farm Area construction activities and physical presence of constructed wind farm infrastructure leading to reduction in access to, or exclusion from established fishing grounds.</p>	<ul style="list-style-type: none"> ▪ Wind Farm Area ▪ Maximum number of turbines: 54 ▪ Minimum distances between turbines: approx. 800 m ▪ Area of seabed occupied by jackets based on up to 54 turbines x 4 leg jacket foundations equates to approximately 1200 m² footprint per turbine (including scour protection), with total for up to 54 turbines of = approximately 0.065 km² ▪ Safety zones around turbine and OSP installation activities (where a vessel is present): 500 m ▪ Safety zones around turbine and OSP installation activities (where a vessel is not present): 50 m ▪ Construction period: 2 - 3 years ▪ Number of OSPs: 2 ▪ Total seabed occupied by OSP (piles, legs and scour protection): approximately 2,400 m². Total for 2 OSPs: 4800 m² (0.0048 km²). ▪ Number of met masts: 1 ▪ Inter-array and inter-connector cables with total length of up to 140km, with 2 m width of direct disturbance plus 8 m width of minor disturbance. ▪ Advisory minimum safe passing distances around inter-array and inter-connector cable installation activities: 500 m ▪ Cable burial likely to involve ploughing/cutting/jetting or if burial cannot be achieved due to rock at seabed surface then a protective cover will be applied over the cable using one of the methods described in Chapter 4: Project Description. ▪ Cable burial target depth of 1.0 – 1.5 m, but potentially up to 3 m in places. It is estimated that up to 20% of inter-array and inter-connector cables may be covered with rock protection where target burial depths cannot be achieved. ▪ All the above infrastructure has the potential to be placed anywhere within the entire Wind Farm Area of 105 km². 	<p>The maximum number of turbines will lead to the maximum area for potential impact on fishing activity during the construction phase. The assessment assumes that the entire Wind Farm Area will not be excluded to fisheries during the construction phase, but that access is limited to areas of construction and installation activity and associated 500 m safety zones or advisory safe passing distances.</p> <p>The maximum width of inter-array and inter-connector corridor will lead to the maximum area for potential impact on fishing in relation to inter-array and inter-connector installation activities.</p>
<p>Displacement from Wind Farm Area leading to gear conflict and increased fishing pressure on adjacent grounds.</p>		

Potential Impact	Worst-Case Design Scenario	Justification
<p>Offshore Export Cable construction activities leading to reduction in access to, or exclusion from, established fishing grounds.</p> <p>Displacement from the Offshore Export Cable Corridor leading to gear conflict and increased fishing pressure on adjacent grounds.</p>	<p><u>Offshore Export Cable Corridor</u></p> <ul style="list-style-type: none"> Maximum number of cables: 2 Maximum length: approximately 43 km each Maximum width of corridor: approximately 300 m Target burial depth between 1.0 – 1.5 m but potentially up to 3 m in places. It is estimated that up to 15% of the offshore export cables may be covered with rock protection where target burial depths cannot be achieved. 500 m advisory safe passing distance around major construction activities along the Offshore Export Cable Corridor (i.e. a roaming exclusion of approximately 0.79 km² along the 43 km cable route corridor). Construction period: 9 months. 	<p>The assessment assumes fishing activity would be prevented from the Offshore Export Cable Corridor within advisory safe passing distances around construction activities, on a rolling basis for periods within a maximum construction duration of up to 9 months.</p>
<p>Wind Farm Area and Offshore Export Cable Corridor construction activities leading to displacement or disruption of commercially important fish and shellfish resources.</p>	<p>The worst case design scenarios for impacts on fish and shellfish species during the construction activities that have been scoped into the EIA Report are presented in Chapter 7: Fish and Shellfish Ecology, Table 7.15.</p>	<p>The scenarios presented in Chapter 7: Fish and Shellfish Ecology, for those issues scoped into the EIA Report, provide for the greatest disturbance to fish and shellfish species and therefore the greatest potential inter-related effect to associated commercial fisheries.</p>
<p>Wind Farm Area and Offshore Export Cable Corridor construction activities leading to additional steaming to alternative fishing grounds for vessels that would otherwise be fishing within the wind farm and export cable areas.</p> <p>Increased vessel traffic within fishing grounds as a result of changes to shipping routes and construction vessel traffic from Wind Farm Area and Offshore Export Cable Corridor leading to interference with fishing activity.</p>	<p>As per the worst case design scenarios described above for the Wind Farm Area and Offshore Export Cable during the construction phase.</p>	<p>As per the above justifications for the Wind Farm Area and Offshore Export Cable during the construction phase.</p>
Operation and Maintenance		
<p>Physical presence of Wind Farm Area leading to reduction in access to, or exclusion from established fishing grounds.</p>	<p><u>Wind Farm Area</u></p> <ul style="list-style-type: none"> Maximum number of turbines: 54 Area seabed occupied by turbines and scour protection: approximately 300 m² per turbine jacket leg. Total for up to 	<p>The assessment assumes that fishing vessels will resume operation within the Wind Farm Area, with exception of a 50 m advisory safe passing distance from</p>

Potential Impact	Worst-Case Design Scenario	Justification
<p>Displacement from Wind Farm Area leading to gear conflict and increased fishing pressure on adjacent grounds.</p> <p>Physical presence of Wind Farm Area leading to gear snagging.</p>	<p>54 turbines of = approximately 0.064 km²</p> <ul style="list-style-type: none"> Minimum distances between turbines: approx. 800 m Maximum number of substations: 2 Total area seabed occupied by OSP (piles, legs and scour protection): approximately 2400 m². Total for 2 OSPs: 4800 m² (0.0048 km²). Number of OSPs: 2 Number of met masts: 1 Up to 140 km of buried or protected inter-array and inter-connector cables. Installed cable protection where burial is not possible is anticipated to be approximately 2 m wide and 0.5 m high. 500 m safety zones or advisory safe passing distances around infrastructure undergoing major maintenance. Advisory operational distance of 50 m from turbines. 	<p>the turbines and avoiding any rock cover protection that may be used at points along the inter-array and inter-connector cable where over trawl surveys show fishing may not resume.</p>
<p>Physical presence of Offshore Export Cable Corridor leading to reduction in access to, or exclusion from established fishing grounds.</p> <p>Displacement from the Offshore Export Cable Corridor leading to gear conflict and increased fishing pressure on adjacent grounds.</p> <p>Physical presence of the Offshore Export Cable leading to gear snagging.</p>	<p><u>Offshore Export Cable</u></p> <ul style="list-style-type: none"> Up to 2 x 43 km buried or protected Offshore Export Cables. 500 m advisory safe passing distances around infrastructure undergoing major maintenance. 	<p>The assessment assumes that fishing vessels will resume operation across the Offshore Export Cable Corridor with the exception of avoiding any rock cover protection that may be used at points along the cable where over trawl surveys show fishing may not resume.</p>
<p>Physical presence of Wind Farm Area and Offshore Export Cable leading to additional steaming to alternative fishing grounds for vessels that would otherwise be fishing within these areas.</p> <p>Increased vessel traffic within fishing grounds as a result of changes to shipping routes and maintenance vessel traffic from the Wind Farm Area and the Offshore Export Cable Corridor leading to interference with fishing activity.</p>	<p>As per the worst case design scenarios described for Wind Farm Area and Offshore Export Cable during the operation and maintenance phase.</p>	<p>As per the above justifications for the Wind Farm Area and Offshore Export Cable during the operation and maintenance phase.</p>
<p>Decommissioning</p>		

Potential Impact	Worst-Case Design Scenario	Justification
As per potential impacts, worst case design scenarios and justifications presented for operation and maintenance.		

10.7.1 Embedded Mitigation

79. A number of mitigation options, both embedded and for implementation, were identified within the design envelope for the Originally Consented Project, during the consultation phase of the Original Application, and during the ongoing liaison with fisheries stakeholders, their representatives and with MS-LOT. As set out in the Scoping Report (and as summarised in Chapter 5: Scoping and Consultation) these have been adopted into the Project design as the design envelope has evolved. Those relating to commercial fisheries are as follows:

- Establishment of and participation in a working group to assist with the following:
 - Dissemination of Project information;
 - Application of safety zones and advisory safe passing distances and implications for fisheries;
 - Navigation of Project construction and maintenance works vessels to and from the site (i.e., agreement of transit lanes to minimise interference to fishing activities, agreement for 'holding' areas for vessels in the event of bad weather);
 - Procedures in the event of interactions between Project construction and fishing activities (i.e. claims for lost and/or damaged gear);
 - Burial and protection of inter-array, inter-connector and Offshore Export Cables;
 - Removal of seabed obstacles during and post-construction; and
 - Post-construction surveys and seabed rectification procedures.
- All infrastructure installed during the construction phase will be marked and lit, in line with standard industry practice, and relevant information will be distributed to fishermen through the agreed channels.
- Cables will be buried where it is reasonably practicable to do so. In instances where adequate burial cannot be achieved then the developers will seek to install cable protection.
- Over trawl surveys will be carried out on the Offshore Export Cable and inter-array and inter-connector cables where cable protection has been required to ensure that the protection scheme has been successful.

10.7.2 Anticipated Consent Conditions

80. A number of consent conditions were attached to the Consents to manage the environmental risk associated with the Originally Consented Project. Those consent condition commitments that are relevant to the potential impacts on commercial fisheries are set out in Table 10.9. If further mitigation is required following the impact assessment process, then this will be included as additional mitigation and is set out in Section 10.9.

Table 10.9: Consent condition commitments relating to commercial fisheries

Design Parameter	Consent Condition requirement
Commercial Fisheries Mitigation Strategy	Setting out, for approval, the mitigation strategy for each commercial fishery in the area that the Scottish Ministers agree may be adversely affected by the Project.
Fisheries Liaison Officer	Appointment of a Project Fishing Liaison Officer (FLO) to establish and maintain effective communications with fishery industry.

Design Parameter	Consent Condition requirement
Cable Plan	Setting out, for approval, the following measures to manage the risk to commercial fisheries: <ul style="list-style-type: none"> ▪ Details of the location and cable laying techniques for the cables; ▪ The results of survey work (including geophysical, geotechnical and benthic surveys) which help inform cable routing; ▪ Technical specifications of cables, including a desk based assessment of attenuation of electro-magnetic field strengths and shielding; ▪ A burial risk assessment to ascertain burial depths and, where necessary, alternative suitable protection measures; ▪ Methodologies for over trawl surveys of the cables through the operational life of the wind farm where mechanical protection of cables laid on the sea bed is deployed; and ▪ Methodologies for cable inspections with measures to address and report any cable exposure.
Commercial Fisheries Working Group	Continued membership of, and participation in the Forth & Tay Commercial Fisheries Working Group to assist with the following: <ul style="list-style-type: none"> ▪ Dissemination of Project information; ▪ Application of safety zones and implications for fisheries; ▪ Navigation of Wind Farm Area construction and works vessels to and from the site (i.e., agreement of transit lanes to minimise interference to fishing activities, agreement for 'holding' areas for vessels in the event of bad weather); ▪ Procedures in the event of interactions between Wind Farm Area construction and fishing activities (i.e. claims for lost and/or damaged gear); ▪ Burial and protection of inter-array, inter-connector and export cabling; ▪ Removal of seabed obstacles during and post-construction; and ▪ Post-construction surveys and seabed rectification procedures.
Navigational Safety Plan	Navigational Safety Plan: Setting out, for approval, the navigational safety measures to mitigate navigational risk to commercial fisheries operating in the area.
Lighting and Marking Plan	Lighting and Marking Plan: Setting out, for approval, the navigational lighting strategy to be installed at the site to ensure safe marking of the structures and Development Area to mitigate the navigational risk to commercial fisheries operating in the area.
Monitoring and Mitigation	Monitoring and mitigation: <ul style="list-style-type: none"> ▪ Participation in the Forth and Tay Regional Advisory Group (FTRAG) established by the Scottish Ministers for the purposes of advising the Scottish Ministers on monitoring and mitigation of, among other things, commercial fish. ▪ Participation in the Scottish Strategic Marine Environment Group (SSMEG) established by the Scottish Ministers for the purposes of advising the Scottish Ministers on monitoring and mitigation of, among other things, commercial fish.

Design Parameter	Consent Condition requirement
Navigational Safety	Navigational Safety: <ul style="list-style-type: none"> ▪ Notify the UKHO prior to the commencement of construction to facilitate the promulgation of maritime safety information and updating of nautical charts and publications through the national Notice to Mariners System. ▪ Issue local Notice to Mariners to ensure local mariners, fishermen’s organisations and HM coastguard are aware of the Licensable Marine Activities. ▪ Consult with local harbour masters as appropriate. ▪ Ensure that details of the works are promulgated in the Kingfisher Fortnightly Bulletin [KIS-ORCA], prior to the commencement of the works to inform the Sea Fish industry of vessel routes, timings and the locations of Project activities. ▪ Ensure appropriate notifications are made following completion of the works to all relevant stakeholders including UKHO, the Maritime Rescue and Coordination Centre Aberdeen and all mariners and fishermen’s organisations. ▪ Ensure appropriate notifications are made through the Kingfisher Fortnightly Bulletin to inform the Sea Fish Industry. ▪ All infrastructure installed will be marked and lit, in line with standard industry practice, and relevant information will be distributed to fishermen through the agreed channels.
Lighting and Marking	Markings, lighting and signals of the Works <ul style="list-style-type: none"> ▪ Ensure that the Project is lit in accordance with the requirements of the relevant statutory stakeholders including marking of the site with appropriate construction buoyage during construction and continued lighting of the site following completion of construction as required by the MCA and NLB. ▪ Ensure that any vessels engaging in the work are marked in accordance with the International Rules for the Prevention of Collisions at Sea if under way and in accordance with the UK Standard Marking Schedule for Offshore Installations if secured to the seabed.

10.8 Impact Assessment

81. The commercial fisheries impact assessment is undertaken at a fleet level, with each impact assessed for each fleet.

10.8.1 Construction Phase Impacts

82. The impacts resulting from the construction of the Project have been assessed on commercial fisheries receptors identified within the study area. A discussion of the likely significance of each effect resulting from each impact is presented below.

10.8.1.1 Wind Farm Area construction activities and physical presence of constructed Project infrastructure leading to reduction in access to, or exclusion from established fishing grounds.

83. During construction in the Wind Farm Area, commercial fisheries will be prevented from fishing within 500 m safety zones (for OSP(s) and turbines) and 500 m advisory safe passing distances (for inter-array and inter-connector) cable installation works) around construction activities (i.e. a roaming exclusion of approximately 0.79 km² around construction activities), including any 50 m safety zones around any structures prior to commissioning. It is assumed the construction will take place as a continual phase for a maximum of 3 years’ duration.

84. This impact will lead to a temporary loss of access to specific fishing grounds within active construction areas and loss of access to the fish resources within these grounds for a range of fishing opportunities during a period within the 3-year construction phase, which will directly affect fleets over a short-term duration. The impact is predicted to be continuous in respect of the Wind Farm Area as a whole and is of relevance to national and local fishing fleets, which is described below on a fleet-by-fleet basis.

85. Embedded mitigation commits to ensuring appropriate notifications are made through the Kingfisher Fortnightly Bulletin to inform the fishing industry of construction activities.

10.8.1.1.1 Potting Vessels

86. Two to three potting vessels are understood to currently operate across the Wind Farm Area, with the potential for up to 70 potting vessels with the operational range to explore these grounds. Combined lobster, brown crab and velvet crab landings have an average annual value of £2.9 million to UK vessels landing from ICES rectangle 41E7, the overwhelming majority of which are Scottish and based at local ports. Specific ports with potting vessels that have potential to operate across the Wind Farm Area include (in no particular order) Pittenweem, Dunbar, Burnmouth, Eyemouth, St Abbs, Crail, Cove, Methil, Leven and Johnshaven (Figure 10.2 (Volume 2)). This is informed by landing statistics by port and industry consultation.
87. The Wind Farm Area has a spatial overlap of 4% of ICES rectangle 41E7. However, fishing activity mapping indicates specific potting grounds over the Wind Farm Area and therefore a higher proportional value is considered likely. Based on the high value of the potting landings, together with the fact that there will be a partial loss of access to shellfish resources and a partial loss of the ability to carry on fishing within parts of the Wind Farm Area during some part of the construction period, across a moderate physical extent, the magnitude is considered to be medium for potting vessels.
88. The potting fleet are typically <10 m in length and operate across more distinct areas of ground, typically 0 to 12 NM from shore. Moderate levels of alternative ground are available to fish and the fleet has a moderate operational range. The sensitivity of the receptor is therefore considered medium.
89. The effect on potting vessels will therefore be of moderate adverse significance, which is significant in EIA terms. Further mitigation is provided in Section 10.9.

10.8.1.1.2 Demersal Otter Trawling Vessels

90. The average annual value of nephrops landed from 41E7 is £4 million. However, it is understood, based on consultation with the industry, that nephrops are typically not heavily targeted across the entirety of the Wind Farm Area. This is supported by aerial surveillance data (for all vessel lengths) and VMS data for >15 m vessels which show some effort along the western portion of the Wind Farm Area. Specific ports with demersal trawling vessels that have potential to operate across the Wind Farm Area include (in no particular order) Pittenweem, Eyemouth, Port Seton and Dunbar. This is informed by landing statistics by port and industry consultation.
91. The squid fishery is not associated with any specific habitat, and thereby demersal trawlers targeting squid could do so throughout the Local Study Area and across the Wind Farm Area. Squid is a highly seasonal and highly fluctuating fishery, which is of relatively low value (£85,000 annually from 41E7).
92. Overall, the magnitude of the impact is considered medium for demersal otter trawling vessels.
93. Demersal otter trawlers generally fish over a moderate operational range, and are expected to be able to avoid the Wind Farm Area given adequate notification. The sensitivity of the receptor is therefore considered low.
94. The effect on demersal otter trawling vessels will therefore be of minor adverse significance, which is not significant in EIA terms.

10.8.1.1.3 Scallop Dredging Vessels

95. Annual landings of scallops from 41E7 show relatively low value fishing in this area (£239,685 annually from 41E7), and VMS indicates significant dredging activity in the adjacent ICES rectangle (42E8). However, the long-term data series shows a prominent spike in scallop landings (in 2007), followed by three years of higher than average landings from 41E7. This fits with the nature of the scallop fishery

moving between grounds throughout the UK on a 7-10 year rolling basis. Indeed, 2015 VMS data shows some dredging activity in the centre of the Wind Farm Area. As such, the magnitude of the impact is considered medium for scallop dredging vessels.

96. Scallop dredgers generally fish over a moderate operational range, and are expected to be able to avoid the Wind Farm Area given adequate notification. The sensitivity of the receptor is therefore, considered to be low.
97. The effect on scallop dredging vessels will therefore be of minor adverse significance, which is not significant in EIA terms.

10.8.1.1.4 Other Dredging Vessels

98. Are understood not to operate across the Wind Farm Area by virtue of the fisheries for razor shell and soft-shell clam typically being undertaken in inshore waters within 6 NM. Given this distribution, the magnitude of the impact is considered negligible and the sensitivity is also considered negligible.
99. The effect on other dredging vessels will therefore be negligible, which is not significant in EIA terms.

10.8.1.2 Displacement from Wind Farm Area leading to gear conflict and increased fishing pressure on adjacent grounds.

100. Exclusion from fishing grounds during construction of the Wind Farm Area may lead to temporary increases in fishing effort in other areas that may already be exploited thereby leading to gear conflict.
101. Industry activity mapping, surveillance data and VMS (for >15m vessels) indicate that there are numerous areas surrounding the Wind Farm Area that are targeted by the same gear types used within the Wind Farm Area. Whether displaced vessels are likely to disperse into these areas depends on the normal fishing patterns of the fleets targeting the area.

10.8.1.2.1 Potting Vessels

102. Conflict over diminished grounds has been repeatedly raised as a concern during consultation with skippers operating potting vessels, both in relation to increased effort by potters and displaced vessels operating mobile gear exploring grounds traditionally fished by potters. Displacement of mobile gear may increase the risk of interaction with potting grounds and gear. However, exclusion impacts for demersal trawl from the Wind Farm Area are not predicted to be significant. As such, the displacement resulting from the Wind Farm Area relates to potters being displaced into grounds already targeted by potters. In this case, two scenarios are feasible:
 - Alternative fishing grounds are available to relocate gear, in which case gear conflict and displacement effects will be low; or
 - Alternative fishing grounds are not available as adjacent areas are already being fished by potters and at or near full capacity, in which case the gear already on the ground limits the level of displacement. While there remains potential for gear conflicts and increased fishing pressure to arise, appropriately mitigated exclusion impacts will limit this.
103. The magnitude is therefore considered low for potting vessels.
104. This form of static fishing gear is considered to be of higher vulnerability to gear conflict interactions since it is left unattended on the seabed. The sensitivity of the receptor is therefore considered medium.
105. The effect on potting vessels will therefore be of minor adverse significance, which is not significant in EIA terms.

10.8.1.2.2 Demersal Otter Trawling Vessels

106. Displaced potting vessels may seek to locate gear in adjacent areas e.g. inshore from the Wind Farm Area and across grounds specifically targeted by demersal trawlers, thereby preventing mobile gear from operating, or resulting in gear conflict. This may lead to a reduction in the level of nephrops trawling activity, and/or gear conflict, which could result in, towed creels and trawl net damage. Overall, the magnitude of the impact is considered medium for demersal otter trawling vessels.
107. Demersal otter trawlers generally fish over a moderate operational range and can therefore avoid areas where potting gear is deployed and clearly marked. The sensitivity of the receptor is therefore considered low.
108. The effect on demersal otter trawling vessels will therefore, be of minor adverse significance, which is not significant in EIA terms.

10.8.1.2.3 Scallop Dredging and Other Dredging Vessels

109. For all dredging gear, due to the lower level of activity across the Wind Farm Area, together with the range of alternative grounds, the magnitude of the impact is considered low and the sensitivity of the receptor is considered low.
110. The effect on scallop dredging and other dredging vessels will therefore be negligible, which is not significant in EIA terms.

10.8.1.3 Offshore Export Cable construction activities within the Offshore Export Cable Corridor leading to reduction in access to, or exclusion from, established fishing grounds.

111. Fishing activity will be locally and temporarily excluded at the location of construction owing to the presence of construction vessels, construction operations and the need to observe The Convention on the International Regulations for Preventing Collisions at Sea, 1972 (COLREGS).
112. The construction scenario assumes a 9-month construction period, built in a continuous phase. An advisory safe passing distance of 500 m will be in place around major construction activities along the export cable corridor (i.e. a roaming approximately 0.79 km² exclusion along the 43 km cable route corridor). Target burial depth will likely be in the region of 1.0 – 1.5 m, but could potentially be up to 3 m (with cable protection installed only where necessary, estimated to be around 20% of the Offshore Export Cable) with the final burial depth being determined by a cable burial assessment.
113. Embedded mitigation commits to ensuring appropriate notifications are made through the Kingfisher Fortnightly Bulletin to inform the fishing industry of construction activities.

10.8.1.3.1 Potting Vessels

114. As described below, the area crossed by the Offshore Export Cable Corridor supports a high value nephrops fishery targeted by demersal trawlers. The mobile effort across this area (which makes co-existence of these gear types challenging) means that potting activity is expected to be relatively limited. However, there are some grounds immediately adjacent to shore that are not targeted by trawlers, and potting vessels could be expected to set creels across this near-shore area. Localised impacts in these inshore areas are anticipated but will be limited to the immediate area of construction activity and associated construction vessels. Overall, and given the likely short term duration of construction, the magnitude is, considered to be low for potting vessels.
115. The potting vessels are mostly <10 m in length and operate across more distinct areas of ground, typically 0 to 12 NM from shore. Moderate levels of alternative ground are available to fish and the fleet has a moderate operational range. The sensitivity of the receptor is therefore considered medium.

116. The effect on potting vessels will therefore be of minor adverse significance, which is not significant in EIA terms.

10.8.1.3.2 Demersal Otter Trawling Vessels

117. The Offshore Export Cable Corridor crosses ICES rectangles 41E7 and 40E7, which have a combined value of £5.1 million in nephrops landings. The nephrops fishery in this area is considered by this assessment to be nationally significant. Defined nephrops grounds occur across the Offshore Export Cable Corridor, a finding supported by industry consultation, industry activity mapping, VMS data specific to demersal trawling, and aerial surveillance data. This would result in a partial loss of resource and partial loss of fishing ground over a moderate-high extent during a short-term period of disruption within a total period of up to 3 years. As such, localised impacts are anticipated but will be limited to the immediate area of construction activity and associated construction vessels. Overall, the magnitude of the impact is considered medium for demersal otter trawling vessels.

118. Demersal otter trawlers generally fish over a moderate operational range, and can avoid areas given adequate notification. However, the Offshore Export Cable Corridor is located across specifically targeted nephrops grounds, making the options for alternative fishing grounds less attractive and less economically viable. The sensitivity of the receptor is therefore considered medium.

119. The effect on demersal otter trawling vessels will therefore be of moderate adverse significance, which is considered significant in EIA terms.

10.8.1.3.3 Scallop Dredging Vessels

120. Scallop dredgers are understood not to operate across the Offshore Export Cable Corridor, with effort focused on the northeast portion of 41E7. As such the magnitude of the impact is, considered low for scallop dredging vessels.

121. Scallop dredgers generally fish over a moderate operational range, and are expected to be able to avoid the area given adequate notification. The sensitivity of the receptor is therefore considered low.

122. The effect on scallop dredging vessels will therefore, be negligible, which is not significant in EIA terms.

10.8.1.3.4 Other Dredging Vessels

123. Are more likely to operate in inshore waters within 6 NM, although it is not known whether the Offshore Export Cable Corridor is specifically targeted. For these reasons, the magnitude of the impact is considered medium and the sensitivity is low.

124. The effect on other dredging vessels will therefore be of minor adverse significance, which is not significant in EIA terms.

10.8.1.4 Displacement from the Offshore Export Cable Corridor leading to gear conflict and increased fishing pressure on adjacent grounds.

10.8.1.4.1 Potting Vessels

125. Demersal otter trawlers are likely to be displaced from the Offshore Export Cable Corridor and could be expected to explore alternative grounds that may already be targeted by potting vessels. Consultation has repeatedly raised displacement as a concern for the potting industry. The magnitude is therefore considered medium for potting vessels.

126. Due to the higher vulnerability of this gear to conflict (as it is left *in situ* on the seabed), the sensitivity of the receptor is considered medium.

127. The effect on potting vessels will therefore be of moderate adverse significance, which is significant in EIA terms.

10.8.1.4.2 Demersal Otter Trawling Vessels

128. Displacement of potting gear from near-shore locations due to the installation of the Offshore Export Cable, into areas targeted by demersal trawlers could lead to gear conflict. Overall, the magnitude of the impact is considered medium for demersal otter trawling vessels.
129. Demersal otter trawlers generally fish over a moderate operational range, and can avoid areas given adequate notification. The sensitivity of the receptor is therefore, considered to be low.
130. The effect on demersal otter trawling vessels will therefore be of minor adverse significance, which is not significant in EIA terms.

10.8.1.4.3 Scallop Dredging and Other Dredging Vessels

131. For all dredging gear, due to the lower level of activity across the Offshore Export Cable Corridor, together with the range of alternative grounds, the magnitude of the impact is considered low and the sensitivity of the receptor is considered low.
132. The effect on scallop dredging and other dredging vessels will therefore, be negligible, which is not significant in EIA terms.

10.8.1.5 Wind Farm Area and Offshore Export Cable construction activities leading to displacement or disruption of commercially important fish and shellfish resources.

133. Temporary displacement due to noise and disruption of habitats during construction activities may decrease or displace commercially important shellfish populations from the area. This section assesses the potential temporary indirect impact for the owners of fishing vessels, where commercially important stocks may be disturbed or displaced to a point where normal fishing practices would be affected.
134. Detailed assessments of the following potential construction impacts have been undertaken in Chapter 7: Fish and Shellfish Ecology for key commercial species (including nephrops, lobster, brown crab, and 'other' fish and finfish species such as mackerel, squid and scallops). Following the Scoping exercise, as described in Chapter 5: Scoping and Consultation, the scope of the EIA in respect of fish and shellfish ecology focused on the following potential impact:
 - Particle motion as a result of foundation installation, cable installation and seabed preparation resulting in potential effects on fish and shellfish receptors.
135. With respect to the magnitude of this impact on commercial fisheries, the overall significance of the effect on fish and shellfish species is considered (i.e. both the magnitude and sensitivity of fish and shellfish species are considered to assess the magnitude on commercial fishing fleets). For instance, where an effect of negligible significance is assessed for a species, a negligible magnitude is assessed for commercial fishing; where an effect of minor adverse significance is assessed for a species, a low magnitude is assessed for commercial fishing, and so on.
136. Details of the fish and shellfish ecology assessment are summarised in Table 10.10, justifications for this assessment are not repeated in this chapter. Evidence, modelling and justifications for these assessments are provided in Chapter 7: Fish and Shellfish Ecology.
137. The impact is predicted to be of regional spatial extent, of relevance to international fishing fleets, and of short-term duration. It is predicted that the impact will affect the receptor directly through loss of resources. The magnitude is therefore considered to be low or negligible for all species and all potential impacts.

Table 10.10 Significance of effects of construction impacts on fish and shellfish ecology

Potential impact	Species	Fish and shellfish ecology: Significance of effect	Commercial fisheries: Magnitude
Particle motion	Nephrops	Minor	Low
	Lobster	Minor	Low
	Brown crab	Minor	Low
	All other fish and shellfish species	Minor	Low

138. Exposure to the impact is likely and commercial fleets targeting key species will be affected, specifically lobster, brown crab, and nephrops.
139. Due to the locality of the impact on these species, the sensitivity of all commercial fisheries fleets is considered medium. This is based on the potential for grounds beyond the immediate construction activities to be affected by increased suspended sediment and sediment deposition, impacting the wider commercial fisheries fleets.
140. The effect on commercial fishing fleets will therefore, be of minor adverse significance for demersal trawlers targeting nephrops and all other fleets, which is not significant in EIA terms.

10.8.1.6 Wind Farm Area and Offshore Export Cable construction activities leading to additional steaming to alternative fishing grounds for vessels that would otherwise be fishing within the Wind Farm Area and Offshore Export Cable Corridor.

141. A detailed Navigational Risk Assessment (Chapter 11: Shipping and Navigation, Appendix 11.1) was undertaken for the Original EIA2, which includes full consideration of commercial fishing vessels while transiting (i.e. from a collision and avoidance perspective). This assessment focuses on the potential impact of longer steaming distances to alternative fishing grounds while construction processes are ongoing.
142. The construction programme for the Project will be communicated through Notice to Mariners and Kingfisher Bulletins with ample warning provided. Construction works will only necessitate minor deviations for fishing vessels transiting along the Offshore Export Cable Corridor during the construction phase. Localised impacts are anticipated but will be limited to the immediate area of construction activity and associated construction vessels. The magnitude is therefore considered low for all fishing fleets.
143. The potting fleet targeting the Wind Farm Area and Offshore Export Cable Corridor operate across a range of grounds to haul and re-set different fleets of creels/pots on a daily basis. Their normal operating range is expected to extend well beyond the various advisory safe passing distances of 500 m radius that will be in place around installation activities. Given adequate notification, it is expected that these vessels will be able to avoid construction areas with no or minimal impact upon steaming times. The sensitivity of the receptor is therefore also considered low.
144. Demersal otter trawlers and dredging vessels also fish over a moderate operational range, and can avoid areas given adequate notification. The sensitivity of these receptors is therefore also considered low.

² The MCA agreed that an updated NRA was not required for the Project EIA, following work undertaken to update the shipping and navigation baseline (presented in Chapter 11: Shipping and Navigation, Appendix 11.2).

145. The effect on all commercial fishing fleets will therefore be negligible, which is not significant in EIA terms.

10.8.1.7 Increased vessel traffic within fishing grounds as a result of changes to shipping routes and construction vessel traffic from Wind Farm Area and Offshore Export Cable Corridor leading to interference with fishing activity.

146. This assessment focuses on the potential impact of the Project related vessel traffic and changes to shipping patterns leading to interference with fishing activity (i.e. reduced access) during construction.

147. Vessel movements (i.e. construction vessels transiting to and from areas undergoing construction works) related to the construction of the Project will add to the existing level of shipping activity in the area (see Chapter 11: Shipping and Navigation). All construction impacts were scoped out of the Shipping and Navigation assessment and are therefore not considered significant.

148. Based on the extent of vessel movements and normal operating procedures around co-existence of fishing vessels with baseline shipping and navigation, a low magnitude of impact is considered for all fleets.

149. Construction traffic is likely to constrain most potting activity across established construction supply routes due to the vulnerability of the marker buoys to the propellers of passing construction vessels. The sensitivity of potting is therefore considered medium.

150. The sensitivity of all other mobile gear types is considered to be low, on account of unlikely interaction between these gears and transiting construction vessels.

151. The effect on the potting vessels will therefore be of minor adverse significance, which is not significant in EIA terms.

152. The effect on all other mobile gears will therefore be negligible, which is not significant in EIA terms.

153. A summary of the impact assessment per commercial fisheries receptor, including magnitude, sensitivity and impact significance for potential impacts during construction is provided in Table 10.11.

Table 10.11: Summary of effect significance per commercial fisheries receptor for potential impacts during construction (and decommissioning).

Potential impact	Potting vessels targeting lobster (with bycatch of brown crab and velvet crab) and seasonal hook & line mackerel fishery			Demersal trawl vessels targeting nephrops & seasonal squid fishery			Scallop dredge vessels targeting scallops			Other dredge fisheries targeting razor shell and soft-shelled clam		
	Magnitude	Sensitivity	Significance of Effect	Magnitude	Sensitivity	Significance of Effect	Magnitude	Sensitivity	Significance of Effect	Magnitude	Sensitivity	Significance of Effect
Construction												
Wind Farm Area construction activities and physical presence of constructed Project infrastructure leading to reduction in access to, or exclusion from established fishing grounds.	Medium	Medium	Moderate	Medium	Low	Minor	Medium	Low	Minor	Negligible	Negligible	Negligible
Displacement from the Project Wind Farm Area leading to gear conflict and increased fishing pressure on adjacent grounds.	Low	Medium	Minor	Medium	Low	Minor	Low	Low	Negligible	Low	Low	Negligible
Offshore Export Cable construction activities within the Offshore Export Cable Corridor leading to reduction in access to, or exclusion from, established fishing grounds.	Low	Medium	Minor	Medium	Medium	Moderate	Low	Low	Negligible	Medium	Low	Minor

Potential impact	Potting vessels targeting lobster (with bycatch of brown crab and velvet crab) and seasonal hook & line mackerel fishery			Demersal trawl vessels targeting nephrops & seasonal squid fishery			Scallop dredge vessels targeting scallops			Other dredge fisheries targeting razor shell and soft-shelled clam		
	Magnitude	Sensitivity	Significance pf Effect	Magnitude	Sensitivity	Significance pf Effect	Magnitude	Sensitivity	Significance pf Effect	Magnitude	Sensitivity	Significance pf Effect
Displacement from the Offshore Export Cable Corridor leading to gear conflict and increased fishing pressure on adjacent grounds.	Medium	Medium	Moderate	Medium	Low	Minor	Low	Low	Negligible	Low	Low	Negligible
Wind Farm Area and Offshore Export Cable construction activities leading to displacement or disruption of commercially important fish and shellfish resources.	Low	Medium	Minor	Low	Medium	Minor	Low	Low	Minor	Low	Low	Minor
Wind Farm Area and Offshore Export Cable construction activities leading to additional steaming to alternative fishing grounds for vessels that would otherwise be fishing within the Wind Farm Area and Offshore Export Cable Corridor.	Low	Low	Negligible	Low	Low	Negligible	Low	Low	Negligible	Low	Low	Negligible

Potential impact	Potting vessels targeting lobster (with bycatch of brown crab and velvet crab) and seasonal hook & line mackerel fishery			Demersal trawl vessels targeting nephrops & seasonal squid fishery			Scallop dredge vessels targeting scallops			Other dredge fisheries targeting razor shell and soft-shelled clam		
	Magnitude	Sensitivity	Significance of Effect	Magnitude	Sensitivity	Significance of Effect	Magnitude	Sensitivity	Significance of Effect	Magnitude	Sensitivity	Significance of Effect
Increased vessel traffic within fishing grounds as a result of changes to shipping routes and construction vessel traffic from Wind Farm Area and Offshore Export Cable Corridor leading to interference with fishing activity.	Low	Medium	Minor	Low	Low	Negligible	Low	Low	Negligible	Low	Low	Negligible

10.8.2 Operational Phase Impacts

154. The impacts resulting from the operation and maintenance phase of the Project have been assessed on commercial fisheries receptors identified within the study area. A discussion of the likely significance of each effect resulting from each impact is presented below.

10.8.2.1 Physical presence of Project infrastructure within the Wind Farm Area leading to reduction in access to, or exclusion from established fishing grounds.

155. The worst case scenario for the Wind Farm Area includes up to 54 turbines and 2 OSPs with jacket foundations with piles (each with a footprint of up to 300 m² inclusive of scour protection), inter-array and inter-connector cables (total of up to 140 km in length, with a target burial depth of 1.0 – 1.5m (but potentially up to 3 m), with an estimated area of 20% surface laid with cable protection installed where adequate cable burial is not possible) and with final target burial depth being defined by a cable burial assessment.
156. There may be a 500 m safety zone or advisory safe passing distance during major maintenance activities. For the purpose of the impact assessment, a 50 m advisory safe passing distance from turbines and OSPs is assumed during operation, equating to a total area of approximately 0.74 km² (i.e. 15 m radius of turbine and scour protection, plus 50 m operating distance, equates to radius of 65 m per turbine, and approximately 0.0132 km² for each turbine, x 54, and each OSP, x2, = approximately 0.74 km²). In relation to inter-array and inter-connector cables and OSPs, there will be a 500 m advisory safe passing distance around maintenance operations, centred on the cable maintenance vessel. The project design envelope specifies the minimum turbine separation distance as being at least 800 m and target burial of cables in the region of 1.0 – 1.5 m, with estimated 20% of cable lengths requiring additional protection.
157. It is therefore expected, on the basis of this worst case scenario that fishing within the Wind Farm Area may be disrupted in places, but would still be possible. Although this is very much dependant on the attitude to risk of the individual skippers, as well as prevailing weather, tidal conditions and different operating requirements associated with gear width when actively fishing.
158. A recent report undertaken by the NFFO (2016) for The Crown Estate explored the potential for fishing to continue within operational wind farms in the Eastern Irish Sea. This was based on interviews with fishermen to understand the extent to which they have chosen to operate within a wind farm, together with assessment of landings statistics and VMS data to identify trends in fishing procedures in these areas. The key findings of the report are as follows (NFFO, 2016):
- Fishing activity within offshore wind farm boundaries has changed, primarily due to the risk associated with fishing gear becoming entrapped by seabed obstacles such as cables, cable crossing points and rock armouring, and in event of vessel breakdown, the additional consequential risk of turbine collision;
 - Wind farm maintenance work was claimed to cause disruption by closing areas to fishing and increasing steaming distances to fishing grounds;
 - The relationship between fishermen and wind farm developers and their service companies was often described as poor in terms of communication and information exchange;
 - However, fishing was found to co-exist with offshore wind farms. A small number of fishermen claimed to operate demersal trawl gear in cable-free corridors between the turbines; and
 - Other fishermen thought confidence to operate inside offshore wind farms would increase as experience and knowledge increased.

159. It should be noted that the focus of this NFFO (2016) study was on demersal trawl vessels targeting nephrops across the wind farm areas, but potting skippers were also interviewed to understand their views.
160. The following embedded mitigation (also outlined in Table 10.9) seeks to mitigate many of the reservations expressed with in the NFFP (2016) report:
- Development of a Commercial Fisheries Mitigation Strategy;
 - Appointment of FLO;
 - Commitment to undertake over trawls on Offshore Export Cable and inter-array and inter-connector cables where cable protection has been required to ensure that the protection scheme has been successful;
 - Continued membership of, and participation in the Forth & Tay Commercial Fisheries Working Group; and
 - Participation in the Forth and Tay Regional Advisory Group and Scottish Marine Environment Group with respect to monitoring and mitigation of commercial fish.

10.8.2.1.1 Potting Vessels

161. During consultation with the local industry, skippers of potting vessels had varying views as to whether they would chose to continue to fish within the operational site. Some believed a wind farm could provide an opportunity to operate without the pressure of mobile gear conflict, while others considered the risk associated with operating within a wind farm to be too great to fish.
162. The minimum spacing between turbines is 800 m. The indicative layout of turbines is presented within Chapter 4: Project Description, in which the spacing ranges from 800 m up to approximately 3.5 km. The layout of the turbines is dense around most of the perimeter of the Wind Farm Area, with four areas of ground within the Wind Farm Area that have no infrastructure. In addition, there is potential to locate gear between approximately five rows or columns, although again this is subject to individual skippers' decision to fish. It is expected that inter-array and inter-connector cabling and associated required protection would not disrupt potting activity.
163. Overall, given that potting activity is known to occur across the Wind Farm Area, together with concerns raised during consultation and the findings of the NFFO (2016) report, it is expected that there will be a reduction in the level of effort that can be undertaken, and therefore a medium magnitude is assessed.
164. The potting fleet are typically <10 m in length and operate across more distinct areas of ground, typically 0 to 12 NM from shore. Moderate levels of alternative ground are available to fish and the fleet has a moderate operational range. The sensitivity of the receptor is therefore considered medium.
165. The effect on potting vessels will therefore be of moderate adverse significance, which is significant in EIA terms.

10.8.2.1.2 Demersal Trawl Vessels and Scallop Dredge Vessels

166. Mobile gears are understood to focus effort in areas out with the Wind Farm Area, notably demersal trawl grounds to the southwest of the Wind Farm Area, and scallop grounds northeast of the Wind Farm Area. However, VMS data do show some effort by demersal trawl and scallop dredgers within the Wind Farm Area. It is considered that 800 m minimum turbine distance would be sufficient to allow fishing to resume in places, subject to weather and tidal conditions and skippers' preferences towards fishing within a wind farm. However, it is assumed that mobile trawling and dredging gear may be impacted in areas in the event that any rock protection is necessary to protect inter-array and inter-connector cabling in the event of inadequate burial. Therefore, overall, based on some rock protection being deployed, a medium magnitude is assessed.

167. Demersal otter trawlers and scallop dredgers generally fish over a moderate operational range, and are expected to be able to avoid the Wind Farm Area given adequate notification of any major maintenance works. Embedded mitigation commits to ensuring appropriate notifications are made through the Kingfisher Fortnightly Bulletin to inform the fishing industry of maintenance works. The sensitivity of the receptor is therefore considered low.
168. The effect on demersal otter trawling vessels and scallop dredgers will therefore be of minor adverse significance, which is not significant in EIA terms.

10.8.2.1.3 Other Dredging Vessels

169. Other dredging vessels are understood not to operate across the Wind Farm Area as the fisheries for razor shell and soft-shell clam are typically undertaken in inshore waters within 6 NM. For this reason, the magnitude of the impact is considered low and the sensitivity is also considered low.
170. The effect on other dredging vessels will therefore be negligible, which is not significant in EIA terms.

10.8.2.2 Physical presence of Export Cable and infrastructure within the Offshore Export Cable Corridor leading to reduction in access to, or exclusion from established fishing grounds.

171. The worst case scenario for the Export Cable Corridor consists of 43 km length of cable, up to two cables approximately 300 m apart along the majority of the corridor. Cable protection is estimated along 20% of the Offshore Export Cable, subject to burial assessment. 500 m advisory safe passing distances may be requested around vessels engaged in Offshore Export Cable repair or reburial works, which could limit fishing opportunities within localised areas of repair works.
172. The assessment assumes that fishing will resume within the vicinity of the Offshore Export Cables soon after their installation. Minimum burial depth of the Offshore Export Cables is uncertain and subject to confirmation in burial assessment, but it is assumed that where areas of cable protection are not necessary, the cable will be buried to a depth that allows demersal trawling gear to operate safely.
173. Notices to Mariners will be issued in advance of any maintenance works. Potting vessels may be required to temporarily relocate pots during maintenance works, although such works are likely to be infrequent.
174. The impact is predicted to be of local spatial extent and of short-term duration for maintenance works that may be required along the Offshore Export Cable. It is predicted that the impact will affect the receptor directly. It is assumed that fishing will resume across the Offshore Export Cable Corridor shortly after installation is complete and during the operational phase, subject to the presence of any cable protection installed and following the completion of over-trawl surveys or other relevant surveys to confirm the condition of the seabed.
175. Given that fishing can resume, subject to confirmation following the over-trawl surveys, across the majority of the Offshore Export Cable Corridor, fishing would only be excluded from discrete areas where repairs or maintenance operations are being completed. The magnitude is considered low for all fishing fleets.
176. Given the importance of the grounds to demersal trawlers, and the higher sensitivity of mobile gear interaction with cable protection where this is installed, the sensitivity of demersal trawlers is considered medium. The sensitivity is low for all other fleets.
177. The effect on demersal trawl vessels will therefore be of minor adverse significance, which is not significant in EIA terms, and negligible for all other fleets which is not significant in EIA terms.

10.8.2.3 Displacement from Wind Farm Area leading to gear conflict and increased fishing pressure on adjacent grounds.

10.8.2.3.1 Potting Vessels

178. The scenarios for potters being displaced into grounds already targeted by potters is provided in Section 10.8.1.2, which remains relevant for this impact. The magnitude is therefore considered low.
179. This form of static fishing gear is considered highly vulnerable to gear conflict interactions since it is left unattended on the seabed. The sensitivity of the receptor is therefore considered medium.
180. The effect on potting vessels will therefore be of minor adverse significance, which is not significant in EIA terms.

10.8.2.3.2 Demersal Otter Trawling Vessels

181. Displaced potting vessels may seek to locate gear in adjacent areas e.g. inshore from the Wind Farm Area and across grounds specifically targeted by demersal trawlers, thereby preventing mobile gear from operating, or resulting in gear conflict. Overall, the magnitude of the impact is considered medium for demersal otter trawling vessels.
182. Demersal otter trawlers generally fish over a moderate operational range and can avoid areas where potting gear is deployed and clearly marked. The sensitivity of the receptor is therefore considered low.
183. The effect on demersal otter trawling vessels will therefore be of minor adverse significance, which is not significant in EIA terms.

10.8.2.3.3 Scallop Dredging and Other Dredging Vessels

184. For all dredging gear, due to the lower level of activity across the Wind Farm Area, together with the range of alternative grounds, the magnitude of the impact is considered low and the sensitivity of the receptor is considered low.
185. The effect on scallop dredging and other dredging vessels will therefore be negligible, which is not significant in EIA terms.

10.8.2.4 Displacement from the Offshore Export Cable Corridor leading to gear conflict and increased fishing pressure on adjacent grounds.

186. It is assumed that fishing will resume across the Offshore Export Cable Corridor shortly after installation is complete and during the operational phase, subject to the presence of any cable protection installed and following the completion of over-trawl surveys or other relevant surveys to confirm the condition of the seabed. Localised exclusions will be in place 500 m around major maintenance activities, but the frequency of such activities is expected to be low. The magnitude of impact and sensitivity of all fleets are therefore considered low.
187. The effect on all fleets will therefore be of negligible, which is not significant in EIA terms.

10.8.2.5 Physical presence of Wind Farm Area and associated infrastructure leading to gear snagging.

188. For all demersal trawling fleets (including otter trawl and dredging), the risk of snagging gear towed on the seabed includes potential interaction with the turbine foundations, OSP foundations and inter-array and inter-connector cabling and any associated cable protection (where this is necessary).
189. Snagging poses a risk to fishing equipment and, in extreme cases, may potentially lead to capsizing of the vessel and crew fatalities, as well as potentially damaging the subsea infrastructure. Three phases of interaction are possible: initial impact of gear and subsea infrastructure; pullover of gear across

subsea infrastructure; and snagging or hooking of gear on the subsea infrastructure. The snagging or hooking phase is the most hazardous to the vessel and crew due to the possibility of capsizing.

190. A range of embedded mitigation is proposed to reduce the risk of snagging occurrence, including:

- Appropriate notifications will be made following completion of the work including through the Kingfisher Fortnightly Bulletin;
- Inter-array and inter-connector cables will be buried to a target depth of 1.0 – 1.5 m where it is reasonably practicable to do so. In instances where adequate burial cannot be achieved then the developers will seek to install cable protection;
- Over trawl surveys will be carried out on inter-array and inter-connector cables where cable protection has been required to ensure that the protection scheme has been successful; and
- All infrastructure installed will be marked and lit, in line with standard industry practice, and relevant information will be distributed to fishermen through the agreed channels.

191. Should snagging occur, the developer would work to the protocols laid out within the guidance by the FLOWW group and *'Recommendations for Fisheries Liaison: Best Practice'* guidance for offshore renewable developers, in particular Section 9: *Dealing with claims for loss or damage of gear* (FLOWW, 2006 and 2014; BERR, 2008).

192. Given the mitigation to avoid snagging occurrences and the provision for protocols to follow should snagging occur, it is considered that the magnitude of impact is low for all mobile and potting fishing fleets.

193. Due to the nature and operation of mobile trawling gear (i.e. it is actively towed and demersal gear directly penetrates the seabed with near continuous contact), there is increased vulnerability to this impact and the sensitivity is therefore considered to be medium for mobile fleets.

194. Potters show a lower vulnerability as the gear is placed, not towed and is less likely to penetrate the seabed. However, potting gear does still move with currents, and can therefore become entangled with turbine, OSP and associated seabed infrastructure, although it is not attached to the vessel at the time that this entanglement may happen. Therefore the sensitivity of potters is considered low.

195. The effect on mobile fleets (including demersal otter trawl and scallop dredge) will therefore be of minor adverse significance, which is not significant in EIA terms.

196. The effect on all other fleets will be of minor adverse significance, which is not significant in EIA terms.

10.8.2.6 Physical presence of the Offshore Export Cable leading to gear snagging.

197. Due to the correlation between impacts of gear snagging with inter-array and inter-connector cables and the export cables, the assessment is the same as that presented above (Section 10.8.2.5), summarised as minor adverse significance, which is not significant in EIA terms.

10.8.2.7 Physical presence of Wind Farm Area, Offshore Export Cable and associated infrastructure leading to additional steaming to alternative fishing grounds for vessels that would otherwise be fishing within these areas.

198. During the operation and maintenance phase, it is expected that fishing will resume across the Offshore Export Cable Corridor soon after cable installation is complete and within areas throughout the Wind Farm Area and. As such, additional steaming outside normal operating ranges will not be necessary.

199. The effects of the operation and maintenance phase are expected to be the same or similar to the effects from construction. The significance of effect is therefore negligible for all commercial fishing fleets (see Section 10.8.1.6), which is not significant in EIA terms.

10.8.2.8 Increased vessel traffic within fishing grounds as a result of changes to shipping routes and maintenance vessel traffic from Wind Farm Area and Offshore Export Cable Corridor leading to interference with fishing activity.

200. The effects of the operation and maintenance phase are expected to be similar or lower to the effects from construction based on lower level of Development Area vessel movements. The significance of effect is therefore negligible for all commercial fishing fleets (see Section 10.8.1.7), which is not significant in EIA terms.
201. A summary of the impact assessment per commercial fisheries receptor, including magnitude, sensitivity and impact significance for potential impacts during operation and maintenance is provided in Table 10.12.

Table 10.12: Summary of impact significance per commercial fisheries receptor for potential impacts during operation and maintenance.

Potential impact	Potting vessels targeting lobster (with bycatch of brown crab and velvet crab) and seasonal hook & line mackerel fishery			Demersal trawl vessels targeting nephrops & seasonal squid fishery			Scallop dredge vessels targeting scallops			Other dredge fisheries targeting razor shell and soft-shelled clam		
	Magnitude	Sensitivity	Significance of Effect	Magnitude	Sensitivity	Impact Significance of Effect	Magnitude	Sensitivity	Impact	Magnitude	Sensitivity	Impact Significance of Effect
Operation and maintenance												
Physical presence of Wind Farm Area leading to reduction in access to, or exclusion from established fishing grounds.	Medium	Medium	Moderate	Medium	Low	Minor	Medium	Low	Minor	Low	Low	Negligible
Physical presence of Offshore Export Cable leading to reduction in access to, or exclusion from established fishing grounds.	Low	Low	Negligible	Low	Medium	Minor	Low	Low	Negligible	Low	Low	Negligible

Potential impact	Potting vessels targeting lobster (with bycatch of brown crab and velvet crab) and seasonal hook & line mackerel fishery			Demersal trawl vessels targeting nephrops & seasonal squid fishery			Scallop dredge vessels targeting scallops			Other dredge fisheries targeting razor shell and soft-shelled clam		
	Magnitude	Sensitivity	Significance of Effect	Magnitude	Sensitivity	Impact Significance of Effect	Magnitude	Sensitivity	Impact	Magnitude	Sensitivity	Impact Significance of Effect
Displacement from Neart na Gaoithe Wind Farm Area leading to gear conflict and increased fishing pressure on adjacent grounds.	Low	Medium	Minor	Medium	Low	Minor	Low	Low	Negligible	Low	Low	Negligible
Displacement from the Offshore Export Cable Corridor leading to gear conflict and increased fishing pressure on adjacent grounds.	Low	Low	Negligible	Low	Low	Negligible	Low	Low	Negligible	Low	Low	Negligible
Physical presence of Wind Farm Area leading to gear snagging.	Low	Low	Minor	Low	Medium	Minor	Low	Medium	Minor	Low	Medium	Minor

Potential impact	Potting vessels targeting lobster (with bycatch of brown crab and velvet crab) and seasonal hook & line mackerel fishery			Demersal trawl vessels targeting nephrops & seasonal squid fishery			Scallop dredge vessels targeting scallops			Other dredge fisheries targeting razor shell and soft-shelled clam		
	Magnitude	Sensitivity	Significance of Effect	Magnitude	Sensitivity	Impact Significance of Effect	Magnitude	Sensitivity	Impact	Magnitude	Sensitivity	Impact Significance of Effect
Physical presence of the Offshore Export Cable leading to gear snagging.	Low	Medium	Minor	Low	Medium	Minor	Low	Medium	Minor	Low	Medium	Minor
Physical presence of Wind Farm Area and Offshore Export Cable leading to additional steaming to alternative fishing grounds for vessels that would otherwise be fishing within these areas.	Low	Low	Negligible	Low	Low	Negligible	Low	Low	Negligible	Low	Low	Negligible

Potential impact	Potting vessels targeting lobster (with bycatch of brown crab and velvet crab) and seasonal hook & line mackerel fishery			Demersal trawl vessels targeting nephrops & seasonal squid fishery			Scallop dredge vessels targeting scallops			Other dredge fisheries targeting razor shell and soft-shelled clam		
	Magnitude	Sensitivity	Significance of Effect	Magnitude	Sensitivity	Impact Significance of Effect	Magnitude	Sensitivity	Impact	Magnitude	Sensitivity	Impact Significance of Effect
Increased vessel traffic within fishing grounds as a result of changes to shipping routes and maintenance vessel traffic from Wind Farm Area and Offshore Export Cable leading to interference with fishing activity.	Low	Low	Negligible	Low	Low	Negligible	Low	Low	Negligible	Low	Low	Negligible

10.8.3 Decommissioning Phase Impacts

202. Impacts from the decommissioning of the Development Area are anticipated to be similar to those assessed during operation and maintenance where the infrastructure remains in-situ at the end of the Project's operational life. Effects resulting from decommissioning activities on commercial fisheries receptors would be expected to be similar to those described during the operational phase.
203. A summary of the impact assessment per commercial fisheries receptor, including magnitude, sensitivity and impact significance for potential impacts during decommissioning is provided in Table 10.11 (as for construction).
204. Towards the end of the operational life of the Project, all decommissioning options will be considered. It may be deemed that removal of certain pieces of infrastructure may have a greater environmental impact than leaving them in-situ. The potential decommissioning options will be presented to MS-LOT in a Decommissioning Programme prior to construction. The Decommissioning Programme will then be reviewed and amended as required prior to the commencement of any decommissioning activities.

10.8.4 Cumulative Impacts Assessment

205. Cumulative effects refer to effects upon receptors arising from the Project when considered alongside other proposed developments and activities and any other reasonably foreseeable project(s) proposals. In this context, the term 'projects' is considered to refer to any project with comparable effects and is not limited to offshore wind projects.
206. Project and activities considered within the cumulative impact assessment are set out in Table 10.13. There may be an element of uncertainty associated with the design envelope of proposed projects; therefore a judgement is made on the confidence associated with the latest available design envelope.
207. Two projects included within Table 10.13 are currently operational, however the timing of construction and/or expected extension in operational life means that temporal overlap may occur and therefore these projects are included within the cumulative impact assessment. To provide further context to this:
- Hywind Scotland Pilot Park construction commenced at the wind farm in April 2017, and became commissioned in October 2017. Part of the Export Cable HDD was installed in September 2016, and all other offshore construction was completed in 2017. These activities are therefore not reflected within the baseline assessment of this Chapter and so included in the CIA.
 - Offshore Renewable Energy Catapult Levenmouth (formerly Fife Energy Park) consist of one demonstration turbine that was installed in 2013 and became operational in 2014. It is consented until 2019; a variation to extend the operational life until 2029 is currently being sought. However, the outcome is unknown, and decommissioning after 2019 represents a temporal overlap for inclusion within the CIA.
208. In assessing the cumulative impacts for the Project, two scenarios are considered to take into account the consented design envelopes of the Inch Cape Wind Farm Area and the Seagreen Phase 1 or Seagreen Alpha and Bravo Wind Farm projects. Scenario One incorporates the design envelopes for the proposed Inch Cape and Seagreen projects as detailed in the Scoping Reports submitted to MS-LOT (ICOL, 2017; Seagreen, 2017). Scenario Two incorporates the consented design envelopes as detailed in the respective project consents.

Table 10.13: Projects for cumulative assessment

Development Type	Project	Status	Data Confidence Assessment / Phase
Wind Farm	Inch Cape Wind Farm Area	Consented	High - project details available
	Inch Cape Wind Farm Area	Proposed	High - Project details provided by Developer
	Seagreen Alpha and Bravo	Consented	High - project details available
	Seagreen Phase I Wind Farm Project	Proposed	High - Project details provided by Developer
	Forthwind Wind Farm Area	Consented	High - project details available
	Forthwind Offshore Wind Demonstration Project	Proposed	High - Scoping Report available
	Kincardine Wind Farm Area	Consented	High - Project details available
	Offshore Renewable Energy Catapult Levenmouth	Operational	High - project details available
	European Offshore Wind Deployment Centre	Consented	High - project details available
	Hywind Scotland Pilot Park	Operational	High - project details available
	Blyth Wind Farm Area	Decommissioning Phase	High - project details available
	Blyth Offshore Wind Demonstration Project	Consented	High - project details available
	Beatrice Wind Farm Area	Under construction	High - project details available
	Moray Offshore East Development	Consented	High - project details available
	Moray East Wind Farm Area – Alternative Design	Proposed	High - Scoping Report available
	Moray Firth Offshore Wind Western Development Area	Proposed	High - Scoping Report available
	Rampion Wind Farm Area	Under construction	High - project details available
	Coastal developments	Rosyth International Container Terminal	Proposed
Marine Protected Areas	Firth of Forth Banks Complex	Designated	Medium – management proposed, but not yet implemented.

209. In addition to the projects outlined in Table 10.13 a review of plans and projects that have entered the planning process was undertaken to inform the cumulative impact assessment for commercial fisheries. Marine Scotland's marine licensing register detailed no licenses currently being considered or having been determined within the Forth and Tay region. Babcock International sought a scoping opinion for Rosyth International Container Terminal in February 2014. No apparent progress has been made on an application for the Rosyth Terminal. Public consultation events were held in June 2016, but a marine licence application is yet to be submitted. Nevertheless, potential temporal overlap exists and this project has been scoped into the CIA.
210. The operations and projects developed by Forth Ports were also considered for assessment within the CIA. Forth Ports own and operate seven commercial ports on the Firth of Forth and the Firth of Tay: Grangemouth, Dundee, Leith (Edinburgh), Rosyth, Methil, Burntisland and Kirkcaldy. Forth Ports provide maritime services including ship handling, pilotage, navigation, conservancy, towage, anchorages and berthing facilities. Forth Ports issue regular Notice to Mariners providing details of any upcoming works, including surveys and anchorages. Anchorage positions may be provided to vessels whose size makes berthing impossible, and are subject to application assessment and approval by Forth Ports, with positions of successful applications communicated via Notice to Mariners.
211. It is understood that there are no planned new developments or projects by Forth Ports e.g. port re-development. The normal working operations of Forth Ports, including ship handling services and anchorages is considered within the normal operating baseline for commercial fisheries. No specific new anchorages are known at this time, and any future occurrence would be subject to their own specific application assessment. As such, no Forth Ports projects are considered within the commercial fisheries CIA.
212. Other coastal developments considered include the INEOS Grangemouth Renaissance project and NPF3 national development designations including Dundee Waterfront, Cockenzie and Longannet. These projects have been scoped out of the commercial fisheries CIA on account of the lack of temporal overlap and/or nature of these projects e.g. a new energy plant at the Grangemouth site will be located onshore and therefore not impact commercial fisheries.
213. A review of marine designated sites was undertaken to understand the likelihood of additional fisheries management measures being implemented to protect designated features. The Firth of Forth Banks Complex lies to the east of the Forth and Tay area and is designated for 'ocean quahog' aggregations and 'offshore subtidal sands and gravels'. The area lies outside the UK's 12 nautical mile limit and as such is exclusively managed under the EU Common Fisheries Policy (CFP). Management measures therefore need to be developed jointly with the UK Government and any Member States with management interests in the area affected. The Scottish Government, jointly with the UK Government, have proposed fishery management measures for the Firth of Forth Complex to the European Commission proposing a zonal management strategy to protect proportions of the designated habitats. Implementation of such a strategy would be subject to agreement with Member States with fishery interests in the area. Such management measures are considered to be a cumulative impact to commercial fisheries and this is included in the CIA.
214. Table 10.14 sets out the potential cumulative impacts and the worst case cumulative design envelope scenario considered within the cumulative impact assessment.

Table 10.14: Cumulative worst-case design envelope scenarios.

Impact	Worst Case Design Scenario	Justification
Construction		
Cumulative effects of reduction in access to, or exclusion from, potential and/or established fishing grounds.	15 offshore wind farm developments with potential	The outcome of the CIA will be greatest when the

Impact	Worst Case Design Scenario	Justification
Cumulative effects of displacement leading to gear conflict and increased fishing pressure on alternative grounds.	combined number of turbines of up to 981 turbines.	greatest number of other schemes, present or planned, are considered.
Cumulative effects of longer steaming distances to alternative fishing grounds.		
Cumulative effects of changes in shipping routes, leading to interference with fishing activity.		
Operation and maintenance		
As per construction	As per construction	As per construction
Decommissioning		
As per construction	As per construction	As per construction

10.8.4.1 Cumulative Construction Phase Impacts

10.8.4.1.1 Cumulative effects of reduction in access to, or exclusion from, potential and/or established fishing grounds.

215. In relation to the potting and demersal trawl fleets, Inch Cape, Seagreen Alpha and Bravo and Forthwind Wind Farm Area and Demonstration Project have the most potential to result in cumulative impacts due to the location of these wind farms and export cable routes and the grounds targeted by these commercial fishing fleets. All other wind farms are expected to have a negligible to minor significance to these fleets.
216. The Original Inch Cape ES concludes a minor/moderate significance of loss of access to squid and crab and lobster fishing grounds during construction of the NnG Development Area, and a minor/moderate significance to squid fisheries and moderate significance to crab, lobster and nephrops fisheries during construction of the export cable route.
217. The Original Seagreen Alpha and Bravo ES concludes significant effects related to loss of ground for the creel fleet during construction of the export cable route, but effects were of minor significance to all other fleets for impacts within the Seagreen wind farms and export cable route.
218. The Forthwind Wind Farm Area predicts minor effects related to all fisheries.
219. The significance of effect, combined with the significance of effect for the Development Area is considered to cumulatively raise the overall significance level to moderate for the lobster and crab potting fleet and nephrops demersal trawl fleet, particularly in relation to the construction of the Offshore Export Cables.
220. In relation to scallop dredgers, Inch Cape, Seagreen Alpha and Bravo and Forthwind Wind Farm Area and Demonstration Project, together with the additional 11 wind farms listed in Table 10.13, have potential to cause cumulative impacts, due to the nomadic nature of the scallop dredge fleet.
221. The Inch Cape ES assesses a moderate significance of loss of access to fishing grounds within the development area for scallop dredgers during construction (and operation and maintenance), and a minor/moderate significance related to the construction of the export cable route. The Seagreen Alpha, Bravo, and Forthwind Wind Farm Area predict no significant impacts to the scallop fleet.
222. Based on the phasing of construction activities, there will be very limited, or no, temporal overlap with the following projects: the Rampion Wind Farm Area; Beatrice Wind Farm Area; Blyth Offshore Wind Demonstration Project; and Offshore Renewable Energy Catapult Levenmouth. Based on the locations of the remaining wind farms within the cumulative assessment (Kincardine Wind Farm Area; European

Offshore Wind Deployment Centre; Hywind Scotland Pilot Park; Moray Offshore East Development; Moray East Wind Farm Area – Alternative Design and Moray Firth Offshore Wind Western Development Area), it is expected that the local scallop fleet would have very limited, or no, physical overlap with these projects and that the nomadic scallop dredge fleet would, with advance warning of activities, be in a position to avoid these specific areas and plan fishing operations accordingly.

223. Given the low level of activity by scallop dredge and other dredge fisheries across the Development Area, it is considered that the combined magnitude does not raise the cumulative impact of the Project above the level that which has already been assessed for this fishery i.e. the resultant effect is of minor significance and not significant in EIA terms.
224. In terms of the scenarios for the Inch Cape Wind Farm Area and the Seagreen Phase 1 Wind Farm Project, the findings of this CIA are consistent for scenarios One and Two, as the most prominent impacts relate to the export cable routes, which have remained consistent from the originally consented projects to the currently proposed projects. It is noted however that the reduced number of turbines proposed for the Inch Cape Wind Farm Area, may lead to a higher levels of fishing resuming within the site, which may overall reduce the cumulative impact.

10.8.4.1.2 Cumulative effects of displacement leading to gear conflict and increased fishing pressure on alternative grounds.

225. The effect of displacement leading to gear conflict and increased fishing pressure is directly correlated to the previous impact of reduced access to fishing grounds (i.e. if there is no reduction in access, then there will be no displacement). There is a moderate impact for reduced access to crab and lobster and nephrops fishing grounds and therefore displacement is expected. As such, the impact of displacement leading to gear conflict is assessed as moderate for potting and nephrops trawling fleets; and minor for all other commercial fisheries fleets. This assessment takes account of a high degree of uncertainty.

10.8.4.1.3 Cumulative effects of longer steaming distances to alternative fishing grounds.

226. Based on the fact that vessels will not be prohibited from transiting through offshore wind farms, with the exception of localised construction activities, the cumulative impact of longer steaming distances is considered to be minor for all fishing fleets.

10.8.4.1.4 Cumulative effects of changes in shipping routes, leading to interference with fishing activity.

227. Based on the fact that vessels will not be prohibited from transiting through offshore wind farms, with the exception of localised construction activities, the cumulative impact of changes in shipping routes, leading to interference with fishing activity is considered to be minor for all fishing fleets.

10.8.4.2 Cumulative Operation and Maintenance Phase Impacts

10.8.4.2.1 Cumulative effects of reduction in access to, or exclusion from, potential and/or established fishing grounds.

228. The justifications provided within the construction assessment are applicable to the assessment of the cumulative effects of reduction in access or exclusion from fishing grounds during operation and maintenance, with the exception of the impacts resulting from Inch Cape Wind Farm Area. The Inch Cape ES found no significant impacts related to reduction in access to the export cable route during operation and maintenance, as resumption of fishing was assumed. The cumulative impact to the lobster and crab potting fleet and nephrops trawl fleet is therefore considered minor. Given this minor cumulative effect of reduced access/ exclusion, the cumulative effect of displacement is also considered to be minor for these fleets.

229. Given the low level of activity by scallop dredge and other dredge fisheries across the Development Area, it is considered that the combined magnitude does not raise the cumulative impact of the Project above the level that which has already been assessed for this fishery i.e. the resultant effect is of minor significance for scallop dredge and negligible for other dredge fisheries, and not significant in EIA terms.
230. For all other effects including longer steaming distances and changes in shipping routes, leading to interference with fishing activity, the cumulative effect is consistent with the assessment of the Project in isolation, which is negligible for all gears and fleets during operation and maintenance.

10.8.4.3 Cumulative Decommissioning Phase Impacts

231. The CIA for the decommissioning phase is consistent with the operation and maintenance assessment.

10.8.5 Inter-relationships

232. Inter-relationships considers the impacts and associated effects of different aspects of the proposal on the same receptor. These are considered to be:
- Project lifetime effects: Assessment of the scope for effects that occur throughout more than one phase of the project (construction, operation, decommissioning) to interact to potentially create a more significant effect on a receptor than if just assessed in isolation in these three key project phases (e.g. displacement of fishing vessels from the Development Area as a result of construction activities, and during operation due to vessel presence and decommissioning);
 - Receptor led effects: Assessment of the scope for all effects to interact, spatially and temporally, to create inter-related effects on a receptor. As an example, all effects on a given receptor such as commercial fishing fleets – displacement of fishing vessels leading to gear conflict, changes to fishery resources, longer steaming times and loss of fishing grounds may interact to produce a different or greater effect on this receptor than when the effects are considered in isolation. Receptor led effects might be short term, temporary or transient effects, or incorporate longer term effects.
233. The accumulation of effects associated with individual impacts is not expected to result in a change to the overall impacts detailed above. This is for two reasons; firstly, embedded mitigation has been identified, and secondly, the impacts relates to different commercial fishing fleets, so are not accumulated across one single receptor.
234. For project lifetime effects, most disturbance (resulting in displacement of fisheries) will occur during the construction and decommissioning phases with minimal disturbance considered likely to arise from maintenance activities (apart from temporary 500 m advisory safe passing distances or safety zones for major maintenance activities) during the operation and maintenance phase. The expected level of significance stated for the construction and decommissioning phases is based upon the reduction in access to, or exclusion from, fishing grounds only. Therefore, across the project lifetime, the effects on commercial fisheries are not anticipated to interact in such a way as to result in combined effects of greater significance than the assessments presented for each individual phase.
235. The impacts on receptors addressed in other ES chapters may potentially further contribute to the impact assessed on commercial fisheries. These are primarily from the Fish and Shellfish Ecology, and Shipping and Navigation chapters. However, no inter-relationships have been identified where an accumulation of impacts on commercial fisheries give rise to a need for additional mitigation over and above that proposed for each individual phase of the project.

10.9 Mitigation and Monitoring

236. The assessment of impacts, both in isolation and cumulatively, on commercial fisheries receptors predicted effects resulting from reduction in access to or exclusion from established fishing grounds to be of moderate significance. In addition to the embedded mitigation set out in Section 10.7.1, the following additional mitigation measures have been identified to reduce or manage the residual effects.
237. Impacts of moderate adverse significance for potting vessels relate to the following impacts and phases:
- Project impact during construction, operational and decommissioning phases: reduction in access to or exclusion from established fishing grounds across the Wind Farm Area.
 - Project impact during construction phase: displacement from the Offshore Export Cable Corridor leading to gear conflict and increased fishing pressure on adjacent grounds.
 - Cumulative impact during construction phase: reduction in access to, or exclusion from, potential and/or established fishing grounds.
 - Cumulative impact during construction phase: displacement leading to gear conflict and increased fishing pressure on alternative grounds.
238. Impacts of moderate significance for demersal trawling vessels relate to the following impacts and phases:
- Project impact during construction phase: reduction in access to or exclusion from established fishing grounds across the Offshore Export Cable Corridor.
 - Cumulative impact during construction phase: reduction in access to, or exclusion from, potential and/or established fishing grounds.
 - Cumulative impact during construction phase: displacement leading to gear conflict and increased fishing pressure on alternative grounds.
239. All other impacts and fleet combinations were of minor adverse significance or negligible, and not significant in EIA terms.
240. While embedded mitigation is applicable to the moderate impacts listed above, it does not lower the impact to be non-significant. These significant impacts relate to potential loss of earnings and loss of the ability to carry out normal working procedures. These are economic issues and therefore the appropriate means to address them is through commitment to disturbance payments. With respect to any justifiable disturbance payment, the procedures as outlined in the FLOWW guidance documents (2014 and 2015), will be followed wherever possible. For all of the significant impacts identified, it is considered that justifiable disturbance payments will reduce the magnitude of the effect to low and the residual effect will therefore, be of minor adverse significance, which is not significant in EIA terms.

10.10 Summary of Residual Effects

241. This chapter has assessed the potential effects on commercial fisheries of the construction, operation and decommissioning of the Project, both in isolation and cumulatively. Where significant effects were identified, additional mitigation has been considered and incorporated into the assessment. Table 10.15 summarises the impact determinations discussed in this chapter and presents the post-mitigation residual significance.

Table 10.15: Summary of predicted impacts of the Project

Potential Impact	Receptor	Significance of Effect	Additional Mitigation Measures	Residual Significance of Effect
Construction				
Wind Farm Area construction activities and physical presence of constructed Offshore Wind Farm leading to reduction in access to, or exclusion from established fishing grounds.	Potters	Moderate	Potters: with respect to any justifiable disturbance payment, the procedures as outlined in the FLOWW guidance documents (2014 and 2015), will be followed wherever possible.	Minor
	Demersal trawl	Minor	n/a	Minor
	Scallop dredge	Minor	n/a	Minor
	All other gear	Negligible	n/a	Negligible
Offshore Export Cable construction activities leading to reduction in access to, or exclusion from, established fishing grounds.	Potters	Minor	n/a	Minor
	Demersal trawlers	Moderate	Demersal trawl: with respect to any justifiable disturbance payment, the procedures as outlined in the FLOWW guidance documents (2014 and 2015), will be followed wherever possible.	Minor
	Scallop Dredge	Negligible	n/a	Negligible
	Other Dredge	Minor	n/a	Minor
Displacement from Neart na Gaoithe Wind Farm Area leading to gear conflict and increased fishing pressure on adjacent grounds.	Potters	Minor	n/a	Minor
	Demersal trawl	Minor	n/a	Minor
	All other gear	Negligible	n/a	Negligible
Displacement from the Offshore Export Cable Corridor leading to gear conflict and increased fishing pressure on adjacent grounds.	Potters	Moderate	Potters: with respect to any justifiable disturbance payment, the procedures as outlined in the FLOWW guidance documents (2014 and 2015), will be followed wherever possible.	: Minor
	Demersal trawl	Minor	n/a	Minor
	All other gear	Negligible	n/a	Negligible
Wind Farm Area and Offshore Export Cable construction activities leading to displacement or disruption of commercially important fish and shellfish resources.	Potters	Minor	n/a	Minor
	Demersal trawl	Minor	n/a	Minor
	All other gear	Minor	n/a	Minor

Potential Impact	Receptor	Significance of Effect	Additional Mitigation Measures	Residual Significance of Effect
Wind Farm Area and Offshore Export Cable construction activities leading to additional steaming to alternative fishing grounds for vessels that would otherwise be fishing within the Wind Farm Area and Offshore Export Cable Corridor.	All other gear	All: Negligible	n/a	All: Negligible
Increased vessel traffic within fishing grounds as a result of changes to shipping routes and construction vessel traffic from Wind Farm Area and Offshore Export Cable Corridor leading to interference with fishing activity.	Potters	Minor	n/a	Minor
	All other gear	Negligible	n/a	Negligible
Operation and maintenance and decommissioning				
Physical presence of Wind Farm Area leading to reduction in access to, or exclusion from established fishing grounds.	Potters	Moderate	With respect to any justifiable disturbance payment, the procedures as outlined in the FLOWW guidance documents (2014 and 2015), will be followed wherever possible.	Minor
	Demersal trawl	Moderate	With respect to any justifiable disturbance payment, the procedures as outlined in the FLOWW guidance documents (2014 and 2015), will be followed wherever possible.	Minor
	Scallop dredge	Minor	n/a	Minor
	All other gear	Negligible	n/a	Negligible
Physical presence of Offshore Export Cable leading to reduction in access to, or exclusion from established fishing grounds.	Demersal trawl	Minor	n/a	Demersal trawl: Minor All others: Negligible
	All other gear	Negligible	n/a	Negligible
Displacement from Neart na Gaoithe Wind Farm Area leading to gear conflict and increased fishing pressure on adjacent grounds.	Potter	Minor	n/a	Minor
	Demersal trawl	Minor	n/a	Minor
	All other gear	Negligible	n/a	Negligible
Displacement from the Offshore Export Cable Corridor leading to gear conflict and increased fishing pressure on adjacent grounds.	All gear types	All: Negligible	n/a	All: Negligible
Physical presence of Wind Farm Area leading to gear snagging.	All gear types	All: Minor	n/a	All: Minor

Potential Impact	Receptor	Significance of Effect	Additional Mitigation Measures	Residual Significance of Effect
Physical presence of the Offshore Export Cable leading to gear snagging.	All gear types	All: Minor	n/a	All: Minor
Physical presence of Wind Farm Area and Offshore Export Cable leading to additional steaming to alternative fishing grounds for vessels that would otherwise be fishing within these areas.	All gear types	All: Negligible	n/a	All: Negligible
Increased vessel traffic within fishing grounds as a result of changes to shipping routes and maintenance vessel traffic from Wind Farm Area and Offshore Export Cable leading to interference with fishing activity.	All gear types	All: Negligible	n/a	All: Negligible
Cumulative				
Construction				
Cumulative effects of reduction in access to, or exclusion from, potential and/or established fishing grounds.	Potter	Moderate	Potters: with respect to any justifiable disturbance payment, the procedures as outlined in the FLOWW guidance documents (2014 and 2015), will be followed wherever possible.	Minor
	Demersal trawl	Moderate	Demersal trawl: with respect to any justifiable disturbance payment, the procedures as outlined in the FLOWW guidance documents (2014 and 2015), will be followed wherever possible.	Minor
	Scallop dredge	Minor	n/a	Minor
	All other gears	Minor	n/a	Minor
Cumulative effects of displacement leading to gear conflict and increased fishing pressure on alternative grounds	Potter	Moderate	Potters: with respect to any justifiable disturbance payment, the procedures as outlined in the FLOWW guidance documents (2014 and 2015), will be followed wherever possible.	Minor
	Demersal trawl	Moderate	Demersal trawl: with respect to any justifiable disturbance payment, the procedures as outlined in the FLOWW guidance documents (2014 and 2015), will be followed wherever possible.	Minor

Potential Impact	Receptor	Significance of Effect	Additional Mitigation Measures	Residual Significance of Effect
	All other gears	Minor	n/a	Minor
Cumulative effects of longer steaming distances to alternative fishing grounds	All gear types	Minor	n/a	Minor
Cumulative effects of changes in shipping routes, leading to interference with fishing activity.	All gear types	Minor	n/a	Minor
Operation and maintenance and decommissioning				
Cumulative effects of reduction in access to, or exclusion from, potential and/or established fishing grounds	Other dredge vessels	Negligible	n/a	Negligible
	All gear types	Minor	n/a	Minor
Cumulative effects of displacement leading to gear conflict and increased fishing pressure on alternative grounds	Other dredge vessels	Negligible	n/a	Negligible
	All gear types	Minor	n/a	Minor
Cumulative effects of longer steaming distances to alternative fishing grounds	All gear types	All: Negligible	n/a	All: Negligible
Cumulative effects of changes in shipping routes, leading to interference with fishing activity.	All gear types	All: Negligible	n/a	All: Negligible

10.11 References

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