Muir Mhòr Offshore Wind Farm

Environmental Impact Assessment Report

Volume 2, Chapter 13: Commercial Fisheries

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Glossary

Term	Definition
Array Area	The area in which the generation infrastructure (including Wind Turbine Generators and associated foundations and inter-array cables), Offshore Electrical Platform(s), and an interconnector cable will be located.
Creel	Creel is typically a Scottish term for a pot or trap deployed by an inshore vessel. Pots and traps are generally rigid structures into which fish or shellfish are guided or enticed through funnels that make entry easy but from which escape is difficult. There are many different styles and designs, each one has been designed to suit the behaviour of its target species.
Demersal	Living on or near the seabed.
Demersal seine	An encircling net shot in the open sea using very long ropes to lay out the net, and ropes on the seabed prior to towing the net closed and hauling from a boat under its own power.
Developer	Muir Mhòr Offshore Wind Farm Limited
Environmental Impact Assessment (EIA) Regulations	Collectively the term used to refer to The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017, The Marine Works (Environmental Impact Assessment) Regulations 2007, and The Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017.
Fish stock	Any natural population of fish which are an isolated and self-perpetuating group of the same species.
Fishery	A group of vessel voyages which target the same species or use the same gear.
Fishing ground	An area of water or seabed targeted by fishing activity.
Fleet	A physical group of vessels sharing similar characteristics (e.g. nationality).
Foundation anchors	The structures which anchor the Floating Foundations to the seabed, connected to the foundation mooring.
Floating Foundations	The floating structures on which the Wind Turbine Generators are installed.
Gear type	The method/equipment used for fishing.
Horizontal Directional Drilling (HDD)	A method of cable installation where the cable is drilled beneath a feature without the need for trenching.
Inter-array cables	Cables which link the wind turbines generators to each other and the Offshore Electrical Platform(s).
Interconnector cable	Cable which links the Offshore Electrical Platforms to one another, allowing for power to be transferred between the platforms
International Council for the Exploration of the Seas (ICES) statistical rectangles	ICES standardise the division of sea areas to enable statistical analysis of data. Each ICES statistical rectangle is ‘30 min latitude by 1 degree longitude’ in size (approximately 30 x 30 nautical miles). A number of rectangles are amalgamated to create ICES statistical areas.
Landfall	The area between Mean High Water Springs (MHWS) and Mean Low Water Springs (MLWS) where the offshore export cables are brought onshore.
Landings	Quantitative description of the amount of fish returned to port for sale, in terms of value or weight.

Term	Definition
Obstacle Free Zone	The Obstacle Free Zone will contain no operational infrastructure from the seabed surface upwards: floating foundations, foundation moorings, foundation anchors, Wind Turbine Generators and offshore electrical platforms.
Offshore Electrical Platform (OEP)	Offshore platform consisting of High Voltage Alternating Current (HVAC) equipment, details depending on the final electrical set up of the Project.
Offshore Export Cable Corridor (ECC)	The area within which the offshore export cables will be installed.
Offshore export cables	The subsea electricity cable circuits running from the Offshore Electrical Platform(s) to the landfall which will transmit the electricity generated by the offshore wind farm to the onshore export cables for transmission onwards to the onshore substation and the national electrical transmission system along with auxiliary cables such as fibre optic cables.
Offshore transmission infrastructure	The proposed transmission infrastructure comprising: Offshore Electrical Platform(s) and associated foundations and substructures; the interconnector cable, the offshore export cables; and the landfall area up to Mean High Water Springs (MHWS).
Otter trawl	A net with large rectangular boards (otter boards) attached to the towing cables which are used to keep the mouth of the trawl net open. Otter boards are made of timber or steel and are positioned in such a way that the hydrodynamic forces, acting on them when the net is towed along the seabed, pushes them outwards and prevents the mouth of the net from closing.
Pelagic	Of or relating to the open sea.
Pelagic trawl	A net used to target fish species in the mid water column.
Project	Muir Mhòr Offshore Wind Farm – comprises the wind farm and all associated offshore and onshore components.
Proposed Development	The offshore Muir Mhòr Offshore Wind Farm project elements to which this Offshore EIA Report relates.
Scallop dredge	A method to catch scallop using steel dredges with a leading bar fitted with a set of spring loaded, downward pointing teeth. Behind this toothed bar (sword), a mat of steel rings is fitted. A heavy net cover (back) is laced to the frame, sides and after end of the mat to form a bag.
Stock assessment	An assessment of the biological stock of a species and its status in relation to defined references points for biomass and fishing mortality.
Swept Area Ratio (SAR)	Swept Area Ratio (SAR) (derived from Vessel Monitoring System (VMS) data) indicates the number of times in an annual period that a fishing gear makes contact with (or sweeps) the seabed surface. Surface SAR provides a proxy for fishing intensity.
Vessel Monitoring System (VMS)	A system, required by law, used in commercial fishing to allow environmental and fisheries regulatory organisations to monitor, minimally, the position, time at a position, and course and speed of fishing vessels which are 12 m and over in length.
Wind Turbine Generator (WTG)	The wind turbines that generate electricity consisting of tubular towers and blades attached to a nacelle housing mechanical and electrical generating equipment.

Acronyms

Term	Definition
AIS	Automatic Identification System
CaP	Cable Plan
Cefas	Centre for Environment Fisheries and Aquaculture Science
CFLO	Company Fisheries Liaison Officer
CIA	Cumulative Impact Assessment
ECC	Export Cable Corridor
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EMF	Electro-magnetic Field
ESCA	European Subsea Cables Association
EU	European Union
FLOWW	Fisheries Liaison with Offshore Wind and Wet Renewables group
FMMS	Fisheries Management and Mitigation Strategy
ICES	International Council for the Exploration of the Sea
KIS-ORCA	Kingfisher Information Service - Offshore Renewable & Cable Awareness
LMP	Lighting and Marking Plan
MD-LOT	Marine Directorate - Licensing Operations Team
MD-SEDD	Marine Directorate - Science, Evidence, Digital and Data
MHWS	Mean High Water Springs
MMO	Marine Management Organisation
MPS	Marine Policy Statement
NAFC	North Atlantic Fisheries College
NERIFG	North and East Coast Regional Inshore Fisheries Group
nm	Nautical mile
NMP	National Marine Plan
NMPi	National Marine Plan interactive
NSP	Navigational Safety Plan
O&M	Operations and Maintenance
OSP	Offshore Electrical Platform
OWF	Offshore Wind Farm
PEMP	Project Environmental Monitoring Plan
RBS	Registered Buyers and Sellers
SAR	Swept Area Ratio
SCDS	Supply Chain Development Statement
SFF	Scottish Fishermen's Federation
SMP	Sectoral Marine Plan

Term	Definition
SWFPA	Scottish White Fish Producers Association
TAC	Total Allowable Catch
TCA	Trade and Cooperation Agreement
UHI	University of Highlands and Islands
UK	United Kingdom
UKCS	United Kingdom Continental Shelf
VMS	Vessel Monitoring System
WTG	Wind Turbine Generator

13. COMMERCIAL FISHERIES

13.1. INTRODUCTION

13.1.1. Muir Mhòr Offshore Wind Farm Limited (hereafter referred to as 'the Developer') is proposing to develop the Muir Mhòr Offshore Wind Farm (hereafter 'the Project'). The Project is made up of both offshore and onshore components. The subject of this offshore Environmental Impact Assessment Report (EIAR) is the offshore infrastructure of the Project seaward of Mean High-Water Springs (MHWS) which is hereafter referred to as 'the Proposed Development'.

13.1.2. The Muir Mhòr Array Area covers an area of approximately 200 km^2 and is located approximately 63 km east of Peterhead on the east coast of Scotland. The offshore infrastructure of the Proposed Development includes Wind Turbine Generators (WTGs) and associated floating foundations, the Offshore Electrical Platform(s) (OEP(s)) and associated foundations, the inter-array cables, interconnector cable, offshore export cables and landfall.

13.1.3. This chapter of the EIAR presents an assessment of the potential impacts and associated Likely Significant Effects (LSE) to commercial fisheries from the 'Proposed Development and discusses appropriate mitigation and monitoring as required to address any significant effects.

13.1.4. This Chapter should be read alongside the following other Chapters and technical Appendices:

- Volume 3, Appendix 13.1 (Commercial Fisheries Technical Report);
- Volume 4, Appendix 4 (Outline Fisheries Management and Mitigation Strategy (FMMS));
- Volume 2, Chapter 10 (Fish and Shellfish Ecology);
- Volume 2, Chapter 14 (Shipping and Navigation); and
- Volume 2, Chapter 17 (Socioeconomics, Tourism and Recreation).

13.1.5. This Chapter includes a summary of information contained in Volume 3, Appendix 13.1 (Commercial Fisheries Technical Report). The Technical Report provides a detailed characterisation of the commercial fisheries baseline.

13.1.6. This Chapter refers to the design of the Proposed Development as described in Volume 1, Chapter 3 (Project Description) of the EIAR.

13.1.7. This Chapter has been prepared by NiMa Consultants Limited.

13.2. PURPOSE OF THE CHAPTER

13.2.1. The primary purpose of the EIAR is defined in Volume 1, Chapter 1 (Introduction).

13.2.2. The key objective of this Chapter is to provide Scottish Ministers and statutory and non-statutory stakeholders, the information required to assess for LSE on commercial fisheries. This assessment will consider those effects from the Proposed Development in isolation, and also cumulative effects (the effects of the Proposed Development combined with the effects from other plans and projects).

13.2.3. This Chapter presents the following:

- A detailed description of current environmental baseline conditions relevant to commercial fisheries. These have been established from: literature review, desk studies, numerical analysis, and consultation with stakeholders;

- Discussion of assumptions and any limitations with respect to the information used to define the baseline;
- Identification of potential impacts and any resulting LSE on commercial fisheries related to Proposed Development activities. This process is informed by the application of embedded commitments;
- Consideration of the need for any 'secondary' mitigation measures (in addition to embedded commitments) to avoid, minimise, reduce, or offset LSE on commercial fisheries from the Proposed Development;
- Consideration of any residual effects following application of secondary mitigation; and
- Identification of monitoring measures to support proposed mitigation.

13.3. LEGISLATION AND POLICY CONTEXT

13.3.1. Overarching legislation, policy, and guidance in relation to the EIAR for the Proposed Development is provided in Volume 1, Chapter 2 (Legislation and Policy Context) of the EIAR. Below is provided a summary of legislation, policy, and guidance directly relevant to commercial fisheries.

LEGISLATION AND POLICY

13.3.2. There are no legislative controls that provide provisions relevant to commercial fisheries.

13.3.3. All policy directly applicable to commercial fisheries is illustrated in Table 13-1.

Table 13-1 Policy relevant to Commercial Fisheries

Policy	Summary	How/Where Chapter has considered this
Sectoral Marine Plan for Offshore Wind Energy (Scottish Government, 2020)	Identifies plan option areas for offshore wind farm development and identifies key consenting issues associated with development. Potential impacts on commercial fishing are identified as a key risk factor to development in East Region plan option areas.	Reflecting the key risk factors identified in the East Region Plan Option areas, this chapter presents an assessment of potential impacts on commercial fisheries in Section 13.7.
Scottish National Marine Plan (NMP) Scottish Government, 2015)	Contains sector-specific policies relevant to offshore wind and commercial fisheries. Policies under Chapter 4: General Policies are of relevance to commercial fisheries, specifically GEN 4 which encourages proposals to enable coexistence and developments that do not result in areas being unsuitable for future use by others. Policies under Chapter 6: Sea Fisheries ('FISHERIES 1 – 5') are considered relevant to commercial fisheries. Policies seek to safeguard existing fishing opportunities and activities wherever possible and advise that mechanisms for managing conflicts between the fishing sector and other users of the marine environment should be in place.	Reflecting the key concerns and issues that should be addressed in an impact assessment and any FMMS, the EIAR: • assesses the potential impacts of the Proposed Development on commercial fisheries in Section 13.7; and • sets out measures to mitigate any constraints that the Proposed Development may place on commercial fishing activity in Section 13.6 and 13.7.

	(FISHERIES 1) Preparation of a Fisheries Management and Mitigation Strategy (FMMS) is recommended where existing fishing opportunities and activity cannot be safeguarded (FISHERIES 3). Chapter 6: Sea Fisheries provides principles for interactions with other users (paragraph 6.22), including short-term displacement of fishing during installation, potential damage to fishing equipment and following best practice guidance (paragraph 6.26). In addition, Chapter 11: Offshore Wind and Marine Renewable Energy provides principles for interactions with other users (paragraphs 11.26-11.29), including physical competition for space due to the impact of the physical presence of structures and encourages an inclusive approach to minimise and avoid impacts; and participation in working groups to develop co-existence and mitigation. Policies under Chapter 14: Submarine Cables (CABLES 2) are considered relevant to commercial fisheries. Policies seek to minimise impacts on the environment and other users, reduce conflict with other users, ensure suitable protection where burial is not feasible and use of post-lay surveys, monitoring and remedial action where required. In addition, Chapter 14: Submarine Cables provides principles for interactions with other users (paragraphs 14.8-14.11), including burial and protection to reduce conflict with other users and prevent damage to cables, engagement with stakeholders and provision of information under the KIS-ORCA (Kingfisher Information Service – Offshore Renewable & Cable Awareness) project.	
United Kingdom (UK) Marine Policy Statement (MPS) (HM Government, 2011)	Explicitly expresses support for the fishing sector, and with regard to displacement, advocates “seeking solutions such as co-location of activity wherever possible”. Specifically, paragraphs 3.8.1, 3.8.2, and 2.3.1.5 stipulate that the process of marine planning should “enable the co-existence of compatible activities wherever possible” and supports the reduction of real and potential conflict as well as maximising compatibility and encouraging co-existence of activities.	Reflecting the desire for co-existence of activities in the marine environment, this chapter presents an assessment of potential impacts on commercial fisheries in Section 13.7.and identifies measures to encourage co-existence in Sections 13.6 and 13.7.

GUIDANCE

13.3.4. The following guidance is directly applicable to Commercial Fisheries and has been considered within this Chapter.

- Good Practice Guidance for assessing fisheries displacement by other licensed marine activities (Scottish Government, 2022);
- Best Practice Guidance for Fishing Industry Financial and Economic Impact Assessments (United Kingdom Fisheries Economic Network and Seafish, 2012);
- Fisheries Liaison with Offshore Wind and Wet Renewables group (FLOWW) Recommendations for Fisheries Liaison: Best Practice guidance for offshore renewable developers (FLOWW, 2014 and noted to be currently in the process of being updated);
- FLOWW Best Practice Guidance for Offshore Renewables Developments: Recommendations for Fisheries Disruption Settlements and Community Funds (FLOWW, 2015);
- Options and opportunities for marine fisheries mitigation associated with wind farms (Blyth-Skyrme, 2010a);
- Developing guidance on fisheries Cumulative Impact Assessment for wind farm developers (Blyth-Skyrme, 2010b);
- Guidelines for data acquisition to support marine environmental assessments of offshore renewable energy projects. Contract report: ME5403 (Centre for Environment Fisheries and Aquaculture Science (Cefas), 2012);
- Guidelines for liaison with the fishing industry on the United Kingdom Continental Shelf UKCS – Issue 8 (Offshore Energies UK, 2023);
- Fishing and Submarine Cables - Working Together (International Cable Protection Committee, 2009);
- European Subsea Cables Association (ESCA) Guideline 01 and Appendices (ESCA, 2018); and
- Guidance on preparing a Fisheries Management and Mitigation Strategy (Draft) (Marine Scotland, 2020).

13.4. CONSULTATION

13.4.1. Ongoing statutory and non-statutory consultation and incorporation of feedback is an integral part of developing a robust EIAR. The EIA Scoping Report for the Proposed Development, see Volume 3, Appendix 5.1 (Offshore Scoping Report) was submitted to the Marine Directorate - Licensing and Operations team (MD-LOT) in June 2023. A detailed response to the Scoping Report's content and questions was provided from MD-LOT, and multiple additional consultees in the September 2023 Scoping Opinion, see Volume 2, Appendix 5.2 (Offshore Scoping Opinion).

13.4.2. Table 13-2 provides a summary of the stakeholder consultation activities specific to commercial fisheries. The issues raised and actions to address and incorporate this feedback into the EIAR are outlined.

13.4.3. Further detail on the Proposed Development's overall EIA stakeholder consultation process and actions is presented in Volume 1, Chapter 5 (Consultation) of the EIAR.

Table 13-2 Consultation Relevant to commercial fisheries

Date	Consultee and Type of Consultation	Description/ Issues Raised	How this has been considered in this Chapter
September, 2023	Marine Directorate's Science, Evidence, Data and Digital Unit (MD-SEDD), Scoping Opinion	Renewable Energy Environmental Advice group: MD-SEDD are content with the proposed study area, including the local study area and the wider area that will be considered for fisheries displacement in the Environmental Impact Assessment (EIA).	This comment is noted by the Developer. The commercial fisheries study areas are presented in Figure 13.1.
September, 2023	MD-SEDD, Scoping Opinion	Renewable Energy Environmental Advice group: MD-SEDD note that only the 2020 VMS data from the MMO has been used for scoping but it is stated that longer term analysis will be used in the EIA.	The Developer confirms that five years of VMS data has been analysed within the EIAR (2016 to 2020). Data for 2021 was not available at the time of EIAR writing.
September, 2023	MD-SEDD, Scoping Opinion	Renewable Energy Environmental Advice group: MD-SEDD has recently published Heat Maps of fishing data (2017-2021) for under 12 metre boats. The layers are on Marine Scotland Maps and downloadable via Spatialdata.gov.scot. The layers can also be accessed from the links at the bottom of this page: Fishing - Activity data and statistics | Marine Scotland Information. MD-SEDD advise that this data is used in the EIA as it is more current than the ScotMap data used.	The Developer confirms that these data have been included in the Commercial Fisheries Technical Report (Volume 3, Appendix 13.1).
September, 2023	MD-SEDD, Scoping Opinion	Renewable Energy Environmental Advice group: MD-SEDD are content with the impact pathways identified for the construction, operation and decommissioning phases of the development. However MD-SEDD advise that the EIA also considers the possibility of permanent exclusion during the operation of the floating wind farm to some types of fisheries such as those using mobile gear due to the potential safety risks of snagging gear on subsea infrastructure with floating wind.	The Developer confirms the worst-case design scenario for assessment presented in Table 13-8 includes loss of access to the floating wind farm during the operational phase.
September, 2023	MD-SEDD, Scoping Opinion	Renewable Energy Environmental Advice group: MD-SEDD note that the Applicant has committed to undertaking over trawl surveys across export cables where mechanical protection of cables laid on seabed has been deployed	The Developer confirms commitment to surveys across areas of mechanical protection of cables.
September, 2023	MD-SEDD, Scoping Opinion	Renewable Energy Environmental Advice group: MD-SEDD advise undertaking a fisheries displacement	The Developer confirms that the impact of displacement provided in Section 13.7 has been

Date	Consultee and Type of Consultation	Description/ Issues Raised	How this has been considered in this Chapter
		assessment and referring to the 'Good practice guidance for assessing fisheries displacement by other licensed marine activities' (Xodus, 2022).	undertaken with regard to Xodus (2022) guidance.
September, 2023	Scottish Fishermen Federation (SFF), Scoping Opinion	SFF note from page 22, section 3.6.1, that there are a number of floating foundations types or 'topologies' under consideration by the project, they include Semi-Submersible, Barge, Tension Leg Platform (TLP), Spar, Multi-Tower Semi-Submersible, Buoy and Semi-Spar. Being mindful of post-development coexistence between fishing industry and the offshore wind farms, SFF's preferred type of mooring system is TLP.	This comment is noted by the Developer. The floating foundation types are described in the Project Description (Volume 1, Chapter 3), with a range of floating foundation types are considered to allow retention of flexibility. The worst-case scenario for commercial fisheries provided in Table 13-8.
September, 2023	SFF, Scoping Opinion	SFF note from section 3.7.8, p28, that the IACs will be buried after the touchdown point onto the seabed.	A detailed cable burial depth assessment will be undertaken to inform the Cable Burial Risk Assessment (CBRA) for the Proposed Development.
September, 2023	SFF, Scoping Opinion	Being concerned of fishing vessels safety, SFF would like to see that maximum efforts are made by the Applicant to ensure 100% cables (IACs and export cables) burial is achieved. In the event of cable burial is not achievable due to technical difficulties, we would recommend using industry standard size (1"-5") rock dump than concrete mattress. The fishing industry is contended of using concrete mattresses in open water.	The Developer confirms that both rock protection and concrete mattresses remain options for cable protection and the final choice of cable protection at specific locations will be dependent on the CBRA. The Developer notes the position of SFF and will avoid use of concrete mattresses where an alternative means of cable protection is possible.
September, 2023	SFF, Scoping Opinion	SFF note from page 31, section 3.7.15 that as an alternative to a fixed surface platform, subsea OEP(s) are also under consideration by the Applicant. We appreciate the fact that the Applicant consider setting up safety zone at the site if subsea OEP(s) are considered; however, we would suggest that the subsea OEP(s) be designed in a way that can be reverse disassembled and totally removed during decommissioning and should not remain any snagging hazard on the seabed.	The Developer confirms that an outline FMMS has been submitted with the consent application, see Volume 4, Appendix 4 (Outline Fisheries Management and Mitigation Strategy). Adoption of the FMMS will occur if and when consent is granted for the Proposed Development. The Developer confirms that at least two weeks notice will be provided ahead of detailed information on construction works. General notification will be provided ahead of the provision of such detail via regular Notice to Mariners. The Developer notes the desire for SFF to be consulted on the cable protection works designed for

Date	Consultee and Type of Consultation	Description/ Issues Raised	How this has been considered in this Chapter
			the Proposed Development.
September, 2023	SFF, Scoping Opinion	SFF note from page 32, section 3.7.17 “any seabed assets, such as cables and pipelines, which are crossed by the Offshore export cable will have a specific crossing design which will be agreed with the asset owner in advance of installation through a cable crossing agreement”. As crossing points create obstacles and snagging hazard to fishing industry, we would suggest that the cable crossing should be avoided as much as possible otherwise the design of cables and pipelines crossing points should be consulted with fishing industry to ensure their impacts are mitigated.	The Developer notes the desire for SFF to be consulted on the cable and pipeline crossing points designed for the Proposed Development.
September, 2023	SFF, Scoping Opinion	SFF note from the page 37, section 3.8.28 that the Applicant will submit a decommissioning programme for approval prior to construction. To reiterate safety concern of the fishing vessels, SFF would like to see all development related infrastructures are recovered/removed to shore and the seabed is restored to its pre-development condition post-decommissioning and it is safe for fishing industry to fully resume in the area.	The Developer is committed to the development of and adherence to a Decommissioning Programme (DP). The DP will outline measures for the decommissioning of the Proposed Development. Decommissioning is likely to include removal of all of the wind turbine components and part of the foundations (those above seabed level) and removal of all other surface infrastructure. Some or all of the array cables, interconnector cables, and offshore export cables may be removed. Scour and cable protection would likely be left *in situ*. The removal of cables and rock protection is considered the worst case design scenario, however the necessity to remove cables and rock protection will be reviewed at the time of decommissioning.
September, 2023	SFF, Scoping Opinion	In response to ' Do you agree with the scoping in and out of impact pathways in relation to benthic subtidal and intertidal ecology?', SFF responded "No. Following should be scoped in: EMF should be scoped in since there is no concrete science to prove that there are no EMF effects from OREIs on marine environment. Note: Boulders relocation effects should also be scoped	The Developer confirms that EMF associated with the O&M phase of the development is assessed within Volume 2, Chapter 9 (Benthic, Subtidal and Intertidal Ecology) and Volume 2, Chapter 10 (Fish and Shellfish Ecology).

Date	Consultee and Type of Consultation	Description/ Issues Raised	How this has been considered in this Chapter
		in since page 113, section 8.4.18 of the report confirms the existence of boulders and exposed bedrock in the vicinity of the development."	
September, 2023	SFF, Scoping Opinion	In response to 'Do you agree with the study areas defined for commercial fisheries?', SFF responded "No specific comment"	Noted.
September, 2023	SFF, Scoping Opinion	In response to 'Do you agree with the use of those data listed in Section 12.3, and any additional anticipated data listed in Section 12.10, being used to inform the Offshore EIA?', SFF responded "Screen shots from plotter data should be used. "	Noted. The Developer can confirm that screen shots of plotter data have informed the commercial fisheries impact assessment but are not published due to confidentiality.
September, 2023	SFF, Scoping Opinion	In response to 'Are there any additional data sources or guidance documents that should be considered?', SFF responded "No specific comment"	Noted.
September, 2023	SFF, Scoping Opinion	In response to ' Do you agree that the embedded commitment measures described provide a suitable means for managing and mitigating the potential effects of the Proposed Development on commercial fisheries receptors?', SFF responded "SFF appreciate: C-11, development of and adherence to a Fisheries Management and Mitigation Strategy (FMMS) by the Applicant. However, we would propose the FMMS to be developed in consultation with fishing industry and adopted pre-consent/development to ensure all fishing industry's concerns are considered and addressed accordingly. C-19, "Advance warning and accurate location details of construction" are shared with fishing industry with sufficient amount of time in advance to ensure no disruption is caused to fishing industry. C-29, the report state, "where practicable, cable burial	The Developer has committed to providing advance warning and accurate location details of construction, maintenance and decommissioning operations, associated Safety Zones and advisory passing distances will be given via Notices to Mariners and Kingfisher Bulletins. Where practicable, advance notice of project activities will be provided at least 14 days ahead of the activity commencing to minimise any disruption to the fishing industry. The Developer notes the desire for SFF to be consulted on the cable protection works designed for the Proposed Development. A Outline FMMS has been developed and provided in Volume 4, Appendix 4:. The Developer is exploring all options for seabed cable protection and would welcome further discussion on this.

Date	Consultee and Type of Consultation	Description/ Issues Raised	How this has been considered in this Chapter
		will be the preferred means of cable protection and cable burial will be informed by the CBRA and detailed within the CaP. In addition, it further elaborates, “In areas where CBRA deems burial not feasible, suitable implementation and monitoring of cable protection will be employed”. To reiterate, SFF are of the view that the statement, “suitable implementation and monitoring of cable protection will be employed” is a very weak statement considering the fact that cable protections pose significant safety concern to fishermen. Therefore, we would like to be consulted on all cable protections work designed for the project. We would like to reiterate that use of concrete mattress in open water is not acceptable to fishing industry."	
September, 2023	SFF, Scoping Opinion	In response to 'Do you agree with the scoping in and out of impact pathways in relation to commercial fisheries?', SFF responded "No. The following should be scoped in: “Additional steaming to alternative fishing grounds for vessels that would otherwise fish within the Proposed Development” since it will cause fishing vessels changing normal route and result in additional steaming. This is applicable for both during construction and decommissioning and operation and maintenance. This may be captured in the Fisheries Management and Mitigation Strategy."	The Developer confirms that additional steaming to alternative fishing grounds will be scoped into the assessment.
September, 2023	SFF, Scoping Opinion	In response to 'Do you agree with the proposed assessment methodology for commercial fisheries?', SFF responded "No specific comment"	Noted.
September, 2023	SFF, Scoping Opinion	In response to 'Do you agree with the assessment of the potential for transboundary effects in relation to commercial fisheries?', SFF responded "No specific comment"	Noted.
September, 2023	SFF, Scoping Opinion	In response to 'Do you agree with the assessment of the proposed approach to cumulative effects in relation	Noted.

Date	Consultee and Type of Consultation	Description/ Issues Raised	How this has been considered in this Chapter
		to commercial fisheries?', SFF responded "No specific comment"	
May 2024	SFF, Scottish White Fish Producers Association (SWFPA) and Scottish Pelagic Fishermen's Association (SPFA)	Presentation of the technical baseline description was provided and discussion on the effects to commercial fisheries. The industry stakeholders raised strong concerns on the effects to demersal pair trawling targeting haddock and pelagic trawling targeting herring. Information on plotter data was discussed.	The Developer has assessed effects on demersal pair trawling and pelagic trawling in Section 13.7 for the Proposed Development and 13.9 for cumulative effects.
September 2024	Pre-Application Consultation Events	Fishing industry stakeholders attended public consultation events to raise concerns of potential impact to commercial fishing businesses.	The impact assessment for commercial fisheries is presented in Section 13.7.
October 2024	Fishing industry vessel owners	Presentation of the Proposed Development and discussion on the effects to commercial fisheries.	The impact assessment for commercial fisheries is presented in Section 13.7. The Developer remains keen to continue engagement with fisheries stakeholders.

13.5. BASELINE ENVIRONMENT

13.5.1. This section presents a summary of the commercial fisheries baseline environment study area, the methodology, baseline conditions and limitations and assumptions of the data used. The supporting analysis undertaken to develop this baseline is provided in Volume 3, Appendix 13.1 (Commercial Fisheries Technical Report).

STUDY AREA

13.5.2. Figure 13.1 shows the commercial fisheries study areas. This includes the following:

- Proposed Development Array Area;
- Offshore Export Cable Corridor (ECC);
- Commercial fisheries local study area; and
- Commercial fisheries regional study area.

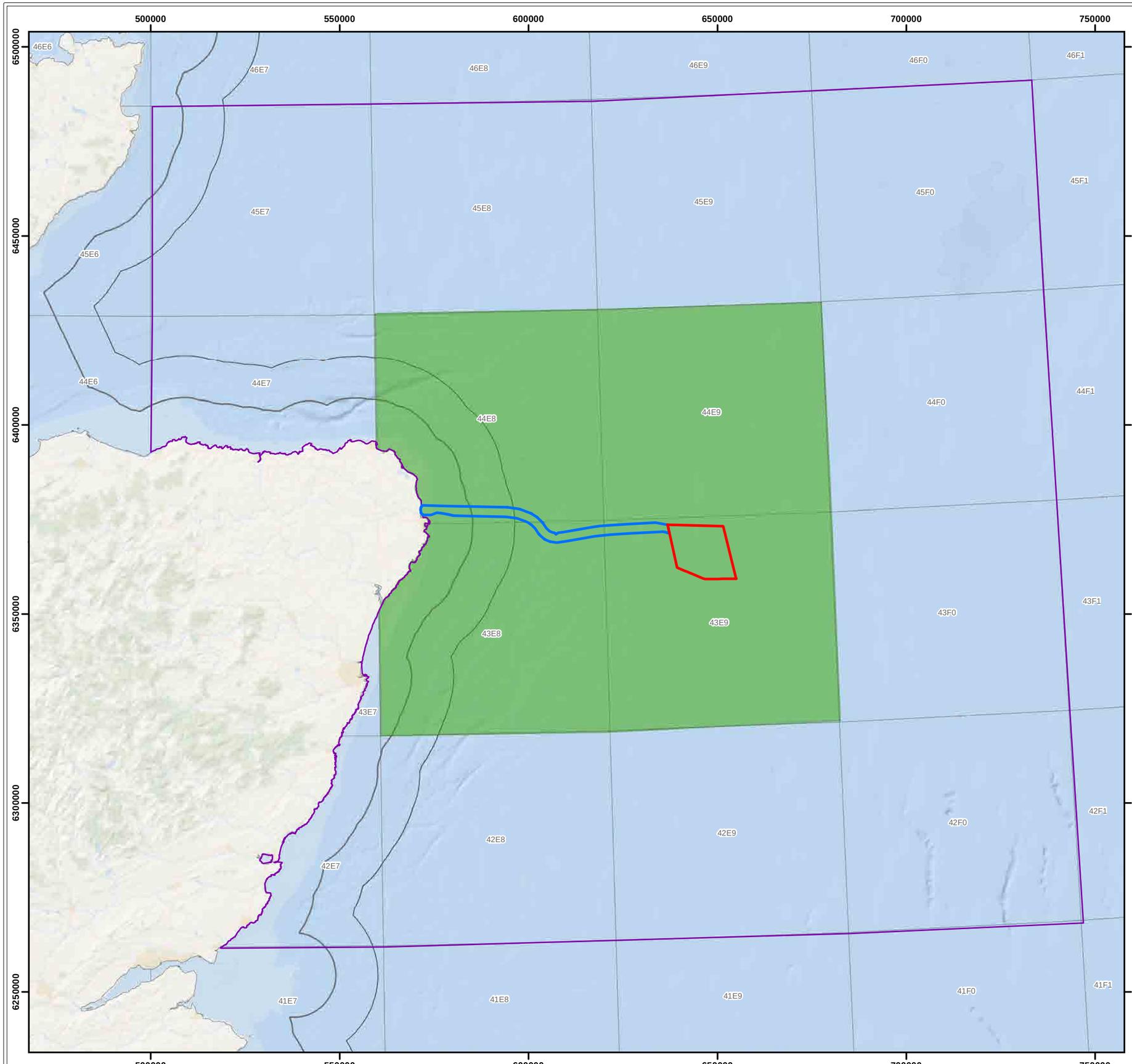
13.5.3. The Proposed Development is located within the north-west portion of the International Council for the Exploration of the Sea (ICES) Division 4b (central North Sea) statistical area; within the United Kingdom (UK) Exclusive Economic Zone (EEZ) waters. The Array Area is located outside the UK territorial waters 12 nautical miles (nm) boundary and the ECC extends outside and inside the 12 nm boundary to shore at landfall. For the purpose of statistical analysis, ICES Division 4b is divided into statistical rectangles which are consistent across all Member States operating in the North Sea. Each ICES statistical rectangle is '30 min latitude and 1 degree longitude' in size, which equates to approximately 30 nm^2.

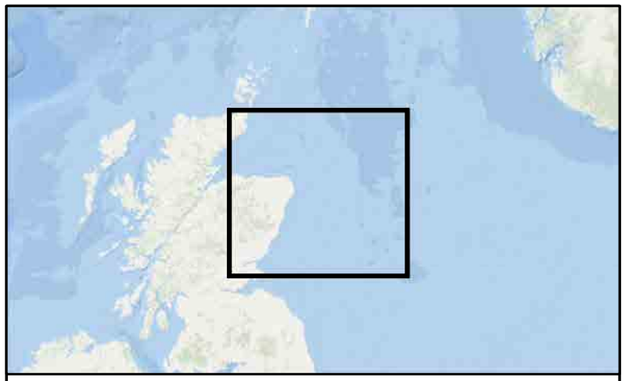
13.5.4. The Array Area is located within ICES rectangle 43E9; and while not overlapping ICES rectangle 44E9, it is located very close to the boundary between 43E9 and 44E9. The EEC extends across ICES rectangles 43E8, 43E9 and 44E8. These three ICES rectangles, together with the ICES rectangle immediately north of the Array Area (44E9) form the commercial fisheries local study area for the purposes of the EIA (Figure 13.1).

13.5.5. In order to understand fishing activity in waters adjacent to the Proposed Development, a commercial fisheries regional study area has been defined to include the commercial fisheries local study area together with the surrounding ICES rectangles. Due to the position of the Proposed Development, this regional study area is relatively large. Analysis of data at the scale of the commercial fisheries regional study area takes into consideration that most commercial fish and shellfish receptor populations are distributed at a wider spatial scale, ensuring that potential implications of displacement of fishing activity can be adequately understood.

13.5.6. To summarise, there are two scales of commercial fisheries study areas as follows:

- Commercial fisheries local study area: 43E8-E9 and 44E8-E9; and
- Commercial fisheries regional fisheries study area: 42E7-F0, 43E7-F0, 44E7-F0, 45E7-F0.





Legend:

- Array Area
- Offshore Export Cable Corridor
- Commercial Fisheries Local Study Area
- Commercial Fisheries Regional Study Area
- ICES statistical rectangles
- 12 nm boundary
- 6 nm boundary

Project: Muir Mhòr	Report: Commercial Fisheries Chapter

Commercial Fisheries Study Areas

Figure: 13.1	Drawing No: GoBe-0001		
Revision:	Date:	Drawn:	Checked:
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Map scale 1:1,000,000 @ A3

0 10 20 km

N

Co-ordinate system: ETRS 1989 UTM Zone 30N **EPSG:** 25830

MUIR MHÒR OFFSHORE WIND FARM

A joint venture between Fred. Olsen Seawind & Vattenfall

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METHODOLOGY

13.5.7. Commercial fisheries information and data has been reviewed and analysed to inform this commercial fisheries baseline. In addition, consultation with commercial fisheries industry representatives has been carried out to aid the collection of baseline information.

DESKTOP STUDY

13.5.8. For the purposes of this commercial fisheries chapter, a desk-based review was undertaken using relevant spatial and scientific data sources.

13.5.9. These existing data sets and literature encompassing the commercial fisheries local and regional study areas, are presented in Table 13-3.

13.5.10. Data has been sourced from ICES, the European Union (EU) Data Collection Framework (DCF), the Marine Directorate National Marine Plan interactive (NMPi), the UK Marine Management Organisation (MMO) and the European Maritime Safety Agency (EMSA).

13.5.11. Where data sources allow, a five to ten-year trend analysis has been undertaken, using the most recent annual datasets available at the time of writing. The temporal extent of this time period is dependent on each data source analysed, e.g. 2012 to 2016; 2016 to 2020; or 2011 to 2022.

13.5.12. Relevant literature from several sources has also been reviewed in the preparation of this report. A full list of references is provided at the end of this report and are cited within the text where appropriate.

13.5.13. The commercial fisheries technical report (Volume 3, Appendix 13.1) includes full details of the analysis undertaken to develop the commercial fisheries baseline.

SITE-SPECIFIC SURVEYS

13.5.14. No site-specific surveys have been undertaken to inform the EIA for commercial fisheries. Baseline data sources have been validated via engagement with fisheries stakeholders and by the results of site-specific marine traffic surveys that are described in Volume 2, Chapter 14 (Shipping and Navigation).

Table 13-3 Key Sources of Commercial Fisheries] Literature and Data

Source, Author, and Year	Summary	Coverage of Proposed Development Local and Regional Study Areas
MMO, 2022a; MMO, 2023a	Landings statistics data for UK-registered vessels, with data query attributes for: landing year; landing month; vessel length category; ICES rectangle; vessel/gear type; port of landing; species; live weight (tonnes); and value (£).	Full coverage of the study areas.
EU DCF, 2022	Landings statistics for EU registered vessels with data query attributes for: landing year; landing quarter; ICES rectangle; vessel length; gear type; species; and, landed weight (tonnes).	Full coverage of the study areas.
MMO, 2022b	VMS data for UK registered vessels ≥15 m length. Note that UK vessels ≥12 m in length have VMS on board, however, to date, the MMO provide amalgamated VMS datasets for ≥15 m vessels only. VMS data sourced from MMO displays the first sales value (£) of catches.	Full coverage of the study areas.
ICES, 2022	VMS data for EU registered vessels ≥12 m length. VMS data sourced from ICES displays the surface Swept Area Ratio (SAR) of catches by different gear types and covers EU (including UK) registered vessels 12 m and over in length. Surface SAR indicates the number of times in an annual period that a demersal fishing gear makes contact with (or sweeps) the seabed surface. Surface SAR provides a proxy for fishing intensity.	Full coverage of the study areas.
EMSA, 2023	Fishing vessel route density, based on vessel AIS positional data. AIS is required to be fitted on fishing vessels ≥15 m length.	Full coverage of the study areas.
MMO, 2023b	Surveillance data indicating vessel nationality and gear type for actively fishing vessels.	Full coverage of the study areas.
Marine Directorate, 2023	Scottish fishing vessel VMS data indicating fishing intensity by gear type.	Coverage of inshore area out to 12 nm, in its entirity
Marine Scotland MAPS NMPi, 2024	Marine Scotland National Marine Plan Interactive (NMPi) (various publication dates) Marine Scotland MAPS NMPi (2023) fisheries datasets	Full coverage of the study areas.
Scottish Government, 2020	Sectoral Marine Plan, including description of regional commercial fisheries activity.	Full coverage of the study areas.
Shelmerdine and Mouat, 2021	North Atlantic Fisheries College (NAFC) Marine Centre University of Highlands and Islands (UHI) (2021), Fisheries activity mapping in the North and East Coast Regional Inshore Fisheries Group (NERIFG) area	Coverage of inshore area out to 12 nm
SPFA, 2024a	Scottish Pelagic Fishermen's Association (SPFA) VMS data for Scottish pelagic trawl member vessels for 2013 to 2021.	Full coverage of the study areas.

SPFA, 2024b [Confidential]	SPFA plotter data for Scottish pelagic trawl member vessels indicating location of fishing.	Full coverage of the study areas.
SFF, 2024 [Confidential]	Scottish Fishermen's Federation (SFF) vessel plotter data indicating location of fishing.	Full coverage of the study areas.
SWFPA, 2024 [Confidential]	Scottish White Fish Producers Association (SWFPA) identified fishing grounds.	Full coverage of the study areas.
Norwegian Directorate of Fisheries, 2023	Statistikkomrader: Norwegian long term vessel monitoring system data for Norwegian vessels.	Full coverage of the study areas.

DESCRIPTION OF BASELINE ENVIRONMENT

13.5.15. A summary of the commercial fisheries baseline environment is provided in the following sections. Full details of the analysis undertaken to develop the commercial fisheries baseline is provided in Volume 3, Appendix 13.1 (Commercial Fisheries Technical Report).

OVERVIEW OF LANDINGS

13.5.16. Landings over the period 2011 to 2022 are presented in Volume 3, Appendix 13.1 (Commercial Fisheries Technical Report). For the purposes of this summary of the baseline description, focus is given to the most recent datasets across a five-year period (2018-2022), with context for longer-term trends provided where relevant. In summary, the 12-year analysis is presented in the Technical Report, with more focus on a recent 5-year period provided in this section.

13.5.17. On average, £13.9 million in first sales value is landed from the commercial fisheries local study area, based on 5-years from 2018-2022. Peak landings occurred in 2022 at a value of £17.5 million. The average annual value landed from the commercial fisheries regional study area is £52.3 million, peaking in 2019 at £68.6 million (Figure 13.2; MMO, 2022a).

13.5.18. Trends in landings from the local study area show a significant drop from 2019 to 2020 (by approximately £1 million), with landings increasing across 2021 and 2022. It is noted that the time period of the baseline data analysis includes years impacted by Covid-19, specifically 2020 and 2021 when restrictions affected normal business operations and market trade. Landings at a national level were seen to decline over this period. For example, the total first sales value of commercial landings Scottish vessels decreased from a high of £735 million in 2016, to a low of £520 million in 2020 due to the impacts of Covid-19 (Marine Directorate, 2023). The total value landed by Scottish vessels has since increased to £617 million in 2022. The trend of increased landings at a Scottish national scale is also seen in the data for the local study area.

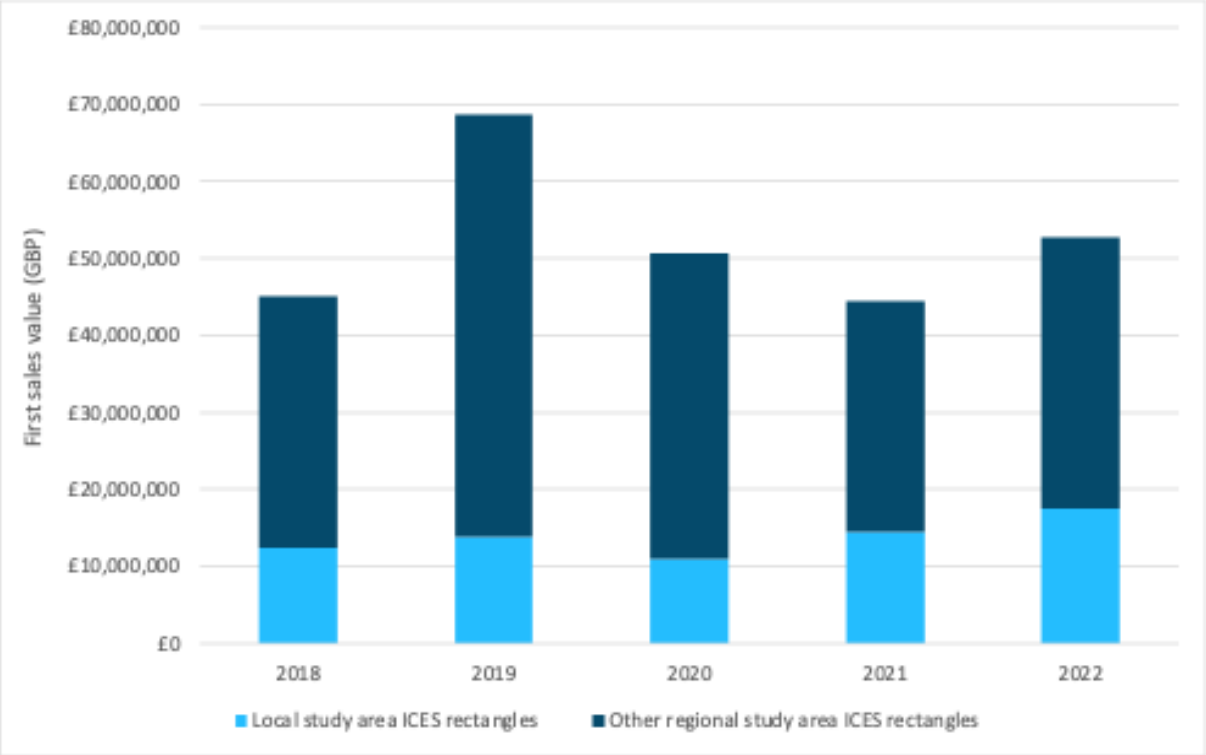


Figure 13.2 Annual landed value from the commercial fisheries regional study area indicating landings from the local study area (shown in turquoise) and from the other ICES rectangles within the regional study area (shown in navy) (data source: MMO, 2022a).

13.5.19. The key species landed from the commercial fisheries local study area are Nephrops norvegicus (also known as Norway lobster, langoustine or prawn, hereon referred to as nephrops), haddock *Melanogrammus aeglefinus*, herring *Clupea harengus*, brown crab *Cancer pagurus*, king scallop *Pectan maximus*, monkfish *Lophius* species, whiting *Merlangius merlangus* and lobster *Homarus gammarus* (Figure 13.3).

13.5.20. Landing statistics indicate that the key fisheries in the regional study area are targeting nephrops, mackerel *Scomber scombrus,* haddock, lobster and brown crab.

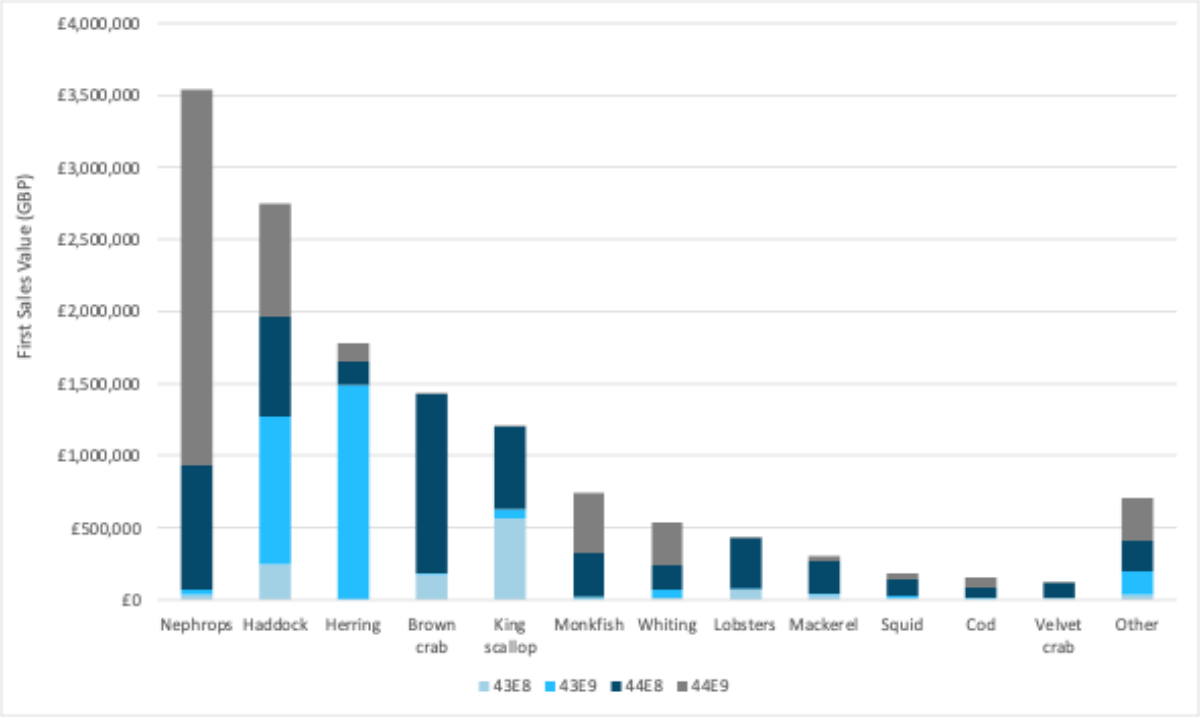


Figure 13.3 Average annual landed value of species from the commercial fisheries local study area indicating ICES rectangle, based on 5-year average from 2018 to 2022 (data source: MMO, 2022a).

13.5.21. Average annual landings from the period 2018 to 2022 are presented by ICES rectangle and species in Figure 13.4 (based on data from MMO, 2022a).

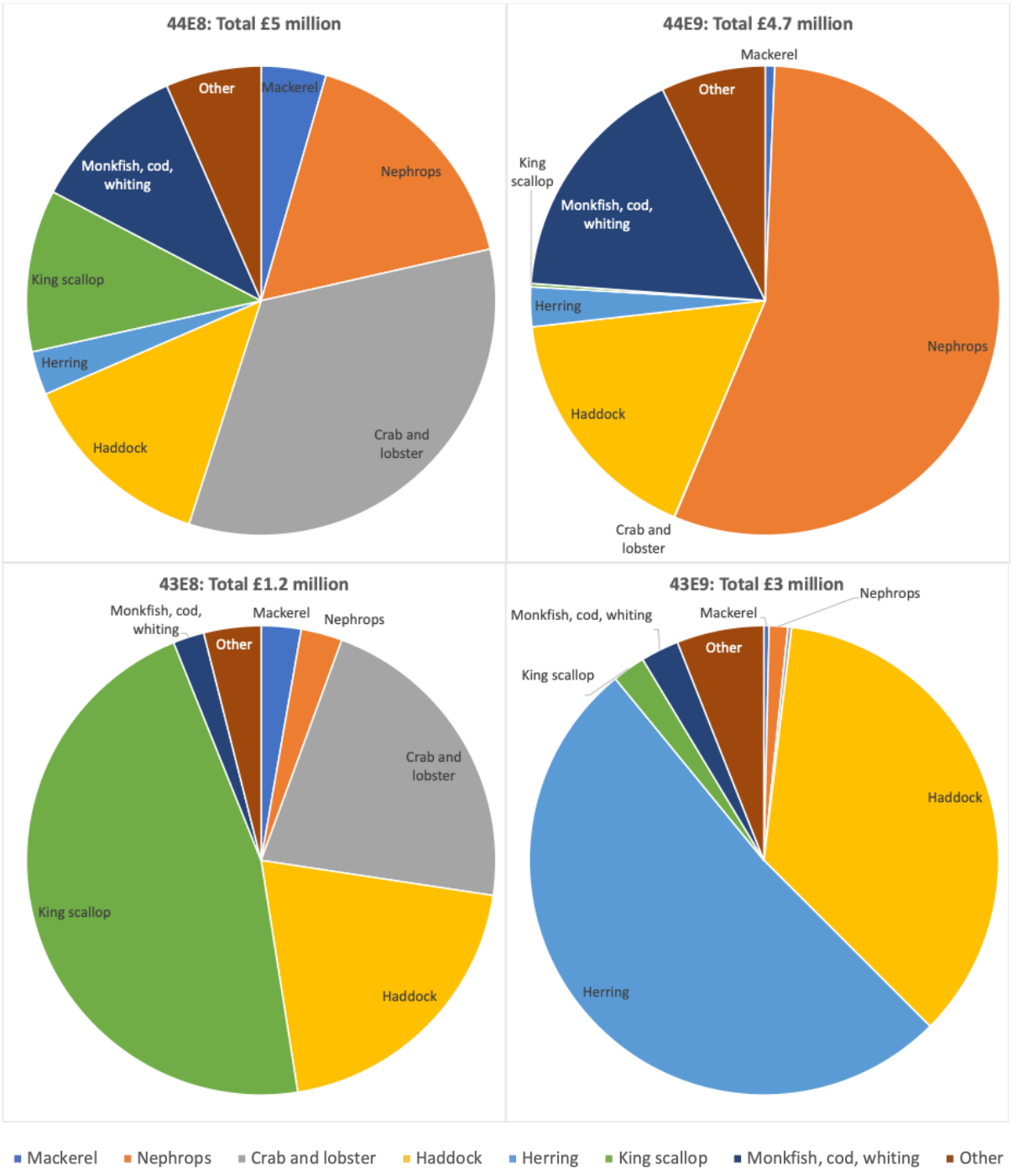


Figure 13.4 Average annual landed value of species from the commercial fisheries local study area by ICES rectangle, based on 5-year average from 2018 to 2022 (data source: MMO, 2022a18).

LANDINGS BY FISHING GEAR TYPES

DEMERSAL OTTER TRAWL FISHERY

13.5.22. The demersal otter trawl fishery targets two distinct fisheries:

- Haddock, whiting and mixed finfish species (targeted by demersal trawl and demersal seine); and
- Nephrops.

13.5.23. The demersal otter trawl/seine fisheries account for £8.6 million first sales value landed annually from the local study area, compared to £32.4 million from the regional study area. When compared to total landings from the local study area, the demersal trawl/seine fisheries account for 62% of the landed value (i.e., £8.6 million out of the total £13.9 million per annum).

13.5.24. The haddock fishery is primarily targeted in ICES rectangle 43E9, which overlaps the Array Area. Consultation with industry stakeholders has identified a portion of the Array Area, in the south west, as an extremely important fishing area for demersal otter pair trawling (i.e., where a demersal trawl net is operated between two vessels).

13.5.25. Amalgamated VMS data for demersal otter trawl vessels is provided in Figure 13.5 which demonstrates the intensity across the south west portion of the Array Area. Long term data series for demersal otter trawl surface swept area is provided for 2009 to 2020 for UK and EU vessels 12m and over in Figure 13.6 and Figure 13.7. Further spatial data is presented in Volume 3, Appendix 13.1 (Commercial Fisheries Technical Report).

13.5.26. The local study area has high level of nephrops landings; however this fishery is primarily targeted in ICES rectangles 44E8 and 44E9, north of the Proposed Development.

13.5.27. Landings by demersal otter trawl and demersal seine vessels are made into Fraserburgh and Peterhead.

SCALLOP DREDGE FISHERY

13.5.28. The scallop dredge fishery primarily operates inshore ICES rectangles 43E8 and 44E9, out to the 12 nm boundary.

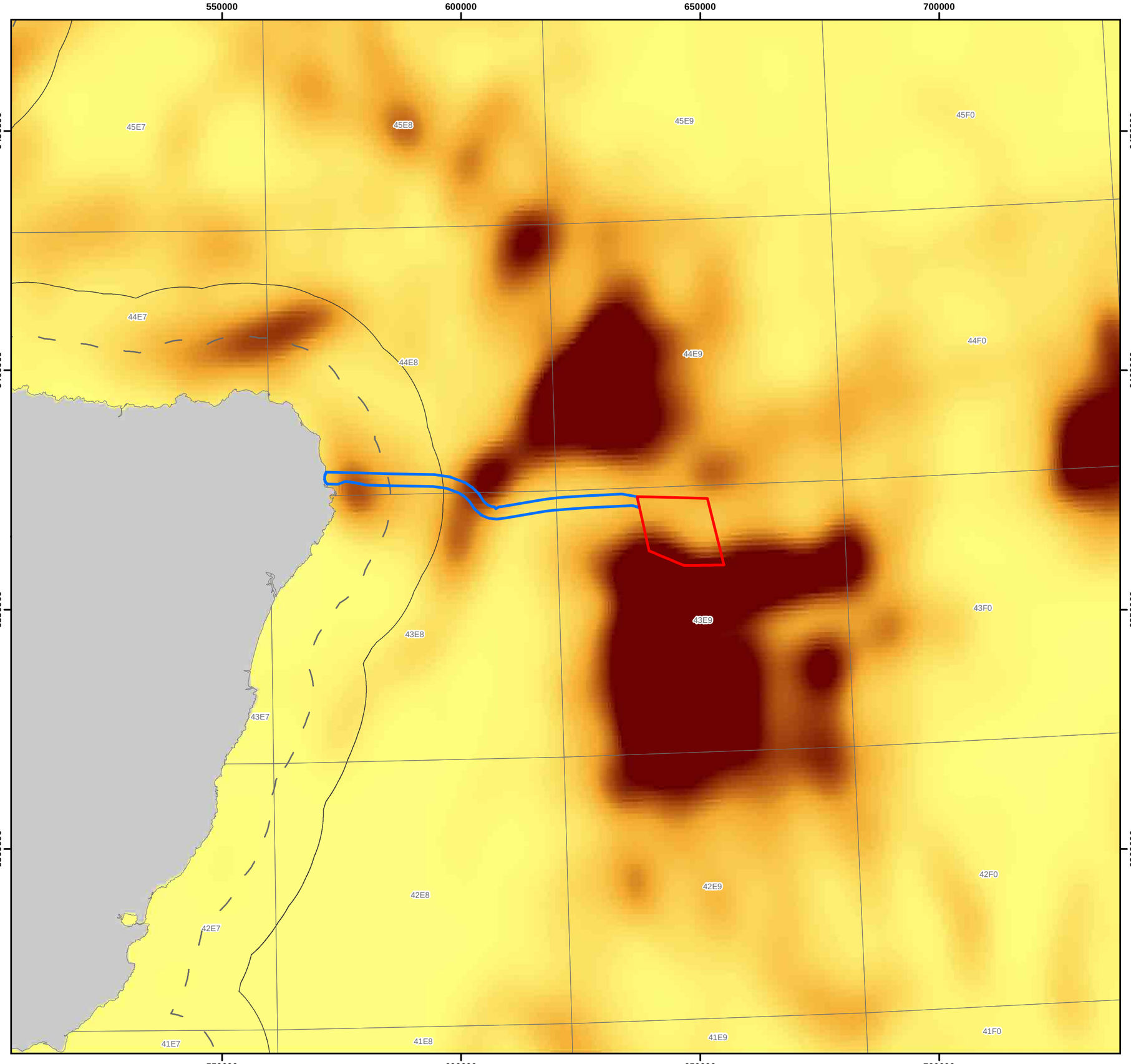
13.5.29. The scallop dredge fishery accounts for £1.2 million first sales value landed annually from the local study area, compared to £2.7 million from the regional study area.

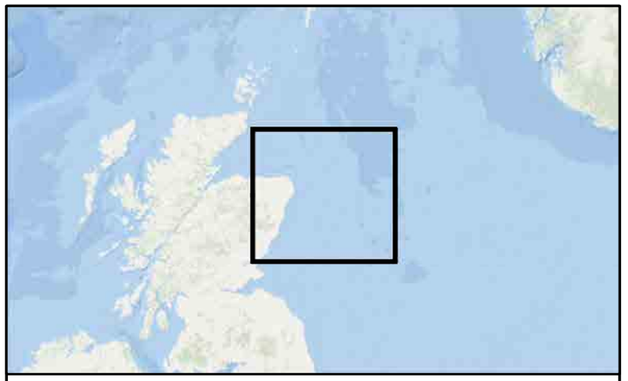
13.5.30. Landings by scallop dredge vessels are made into Fraserburgh and Peterhead. Scallops are targeted seasonally from May to September.

POTTING FISHERY

13.5.31. The potting fishery primarily targets brown crab, lobster and velvet crab and accounts for £2 million first sales value landed annually from the local study area, compared to £7.2 million from the regional study area.

13.5.32. In the local study area, activity is focused in the inshore areas from 0-3 nm. Landings by potting vessel are made into Fraserburgh and Peterhead. Crabs are caught year round, peaking in December; and lobster are targeted from July to December with landings peaking in August.





Legend:

- Array Area
- Offshore Export Cable Corridor
- ICES statistical rectangles
- 12 nm boundary
- 6 nm boundary

Demersal mobile amalgamated VMS intensity

Value

High : 0.468461

Low : 0

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Demersal mobile VMS
Fishing Intensity (2009-2013)

Figure: 13.5	Drawing No: GoBe-0001		
Revision:	Date:	Drawn:	Checked:
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Map scale 1:800,000 @ A3

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Co-ordinate system: ETRS 1989 UTM Zone 30N **EPSG:** 25830

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A joint venture between Fred. Olsen Seawind & Vattenfall

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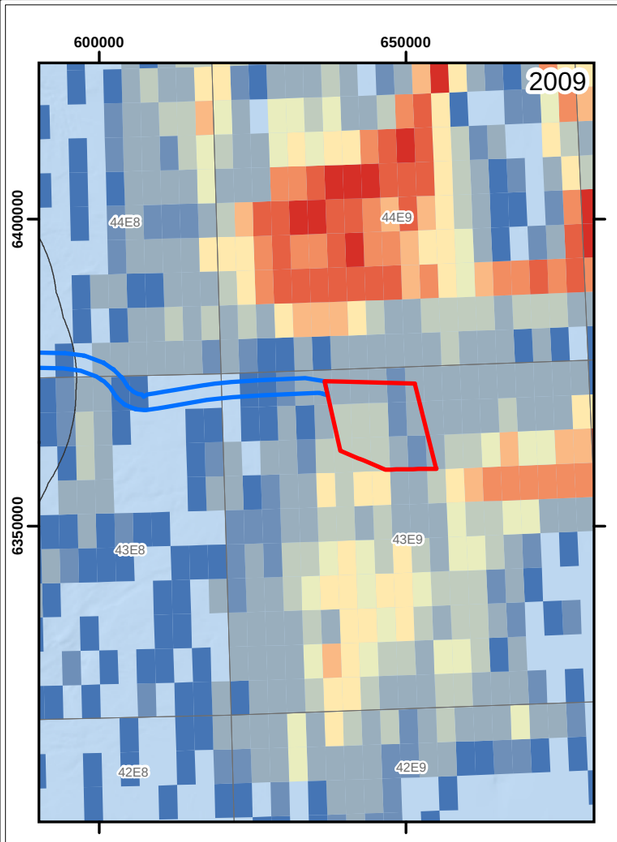

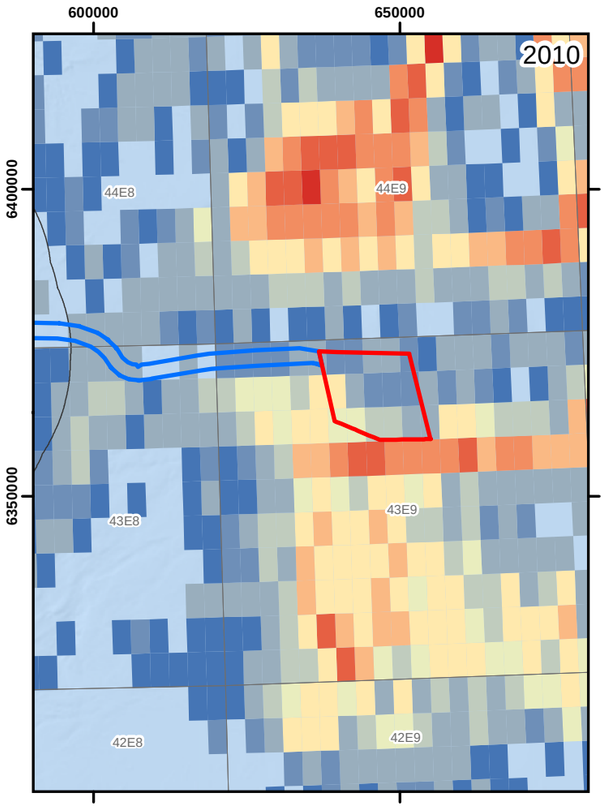

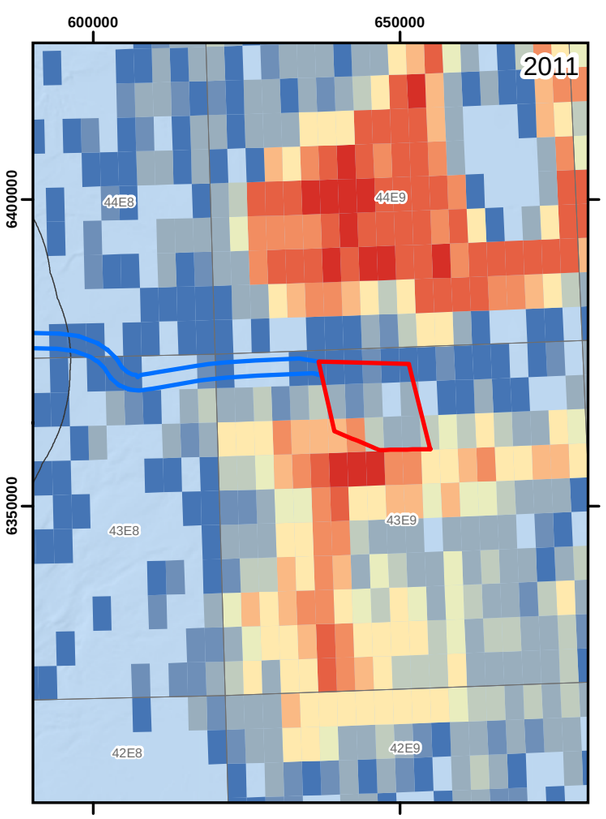

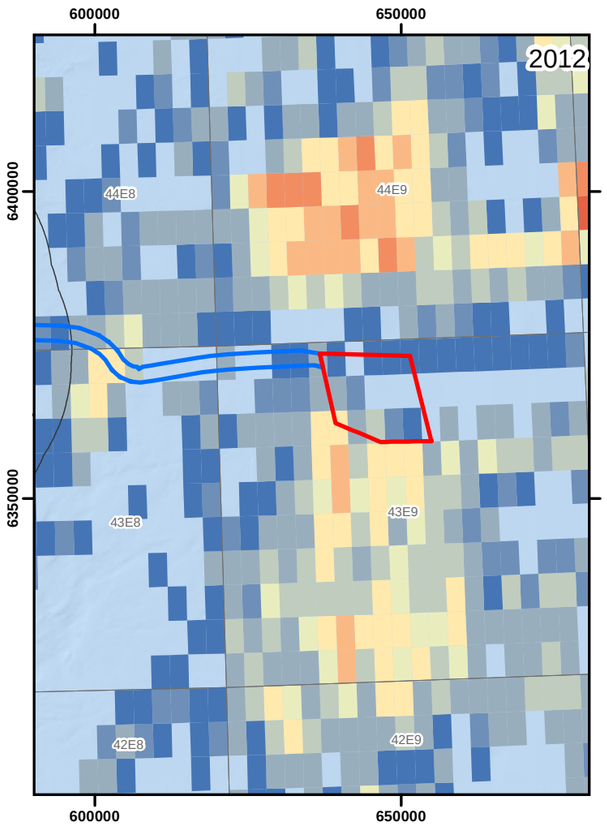

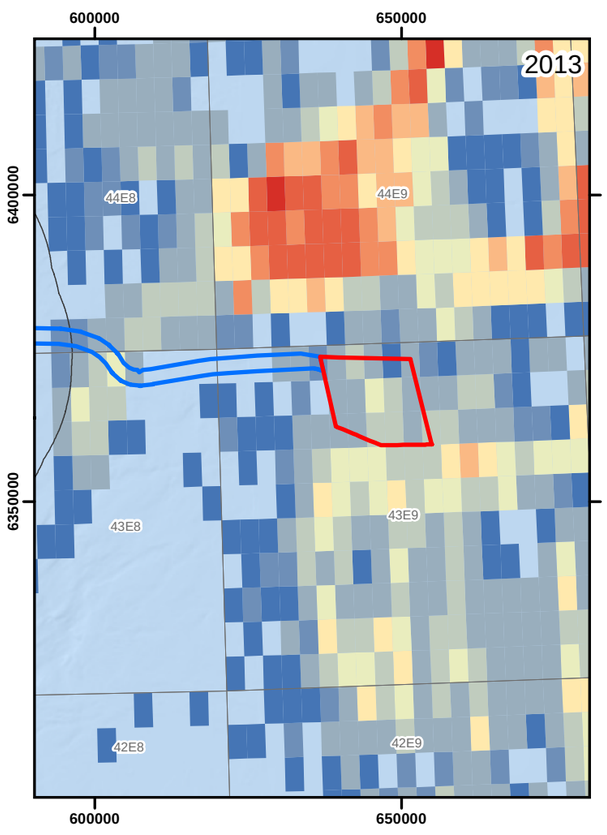

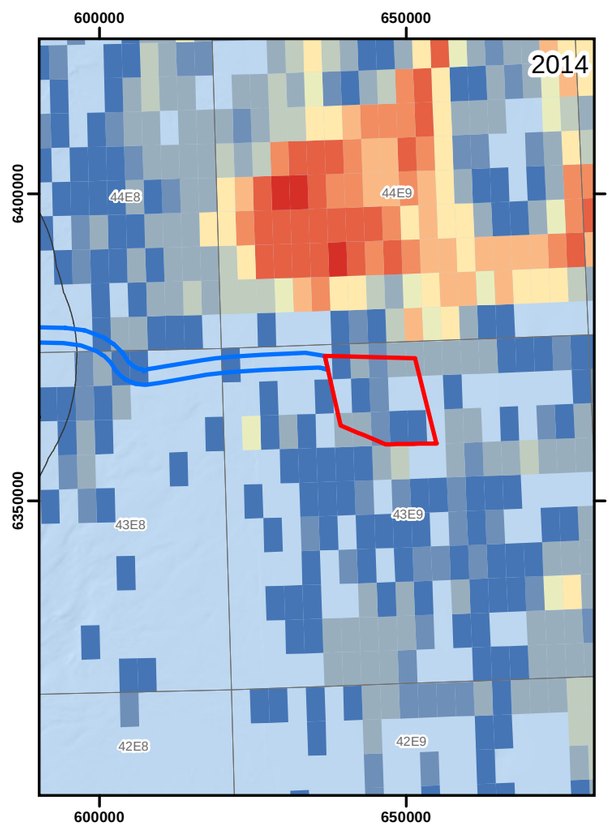

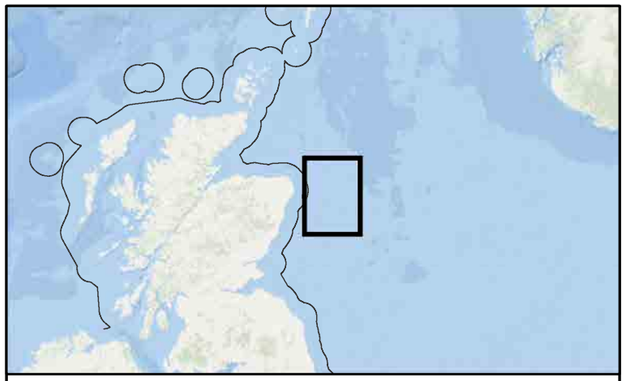

Legend:

- Array Area
- Offshore Export Cable Corridor
- ICES statistical rectangles
- 12 nm boundary

Demersal Otter Trawl Effort

Kilo Watt Hours (KWHr)

- 0 - 2,200.00
- 2,200.00 - 4,500.00
- 4,500.01 - 15,000.00
- 15,000.01 - 20,000.00
- 20,000.01 - 25,000.00
- 25,000.01 - 45,000.00
- 45,000.01 - 50,000.00
- 50,000.01 - 75,000.00
- 75,000.01 - 100,000.00
- 100,000.01 - 2,018,104.00

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Annual Demersal Otter Trawl Effort
UK and EU vessels 12m and over
2009 to 2014

Figure: 13.6	Drawing No: GoBe-0001		
Revision:	Date:	Drawn:	Checked:
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Map scale 1:1,000,000 @ A3

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Co-ordinate system: ETRS 1989 UTM Zone 30N **EPSG:** 25830

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A joint venture between Fred. Olsen Seawind & Vattenfall

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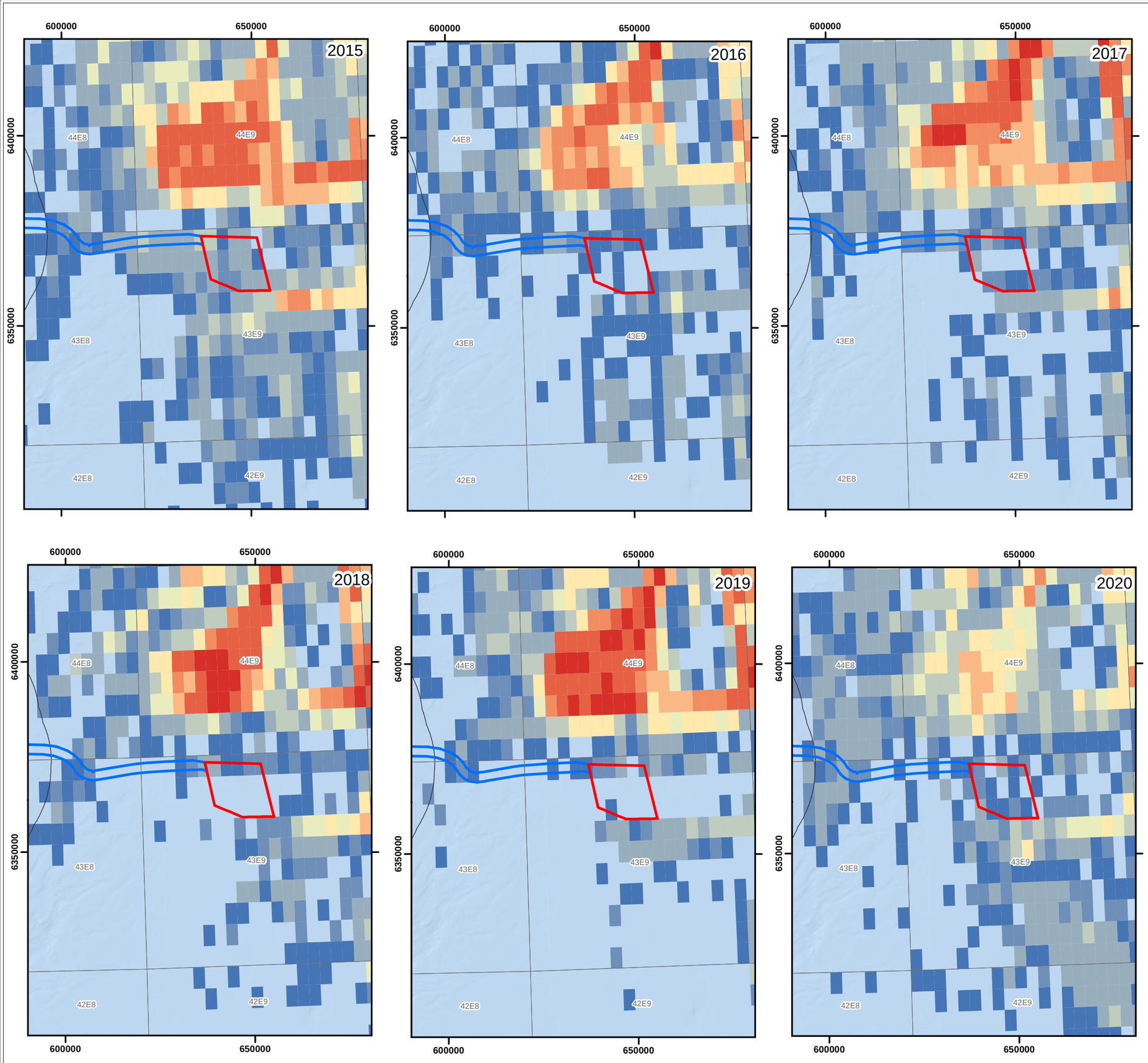

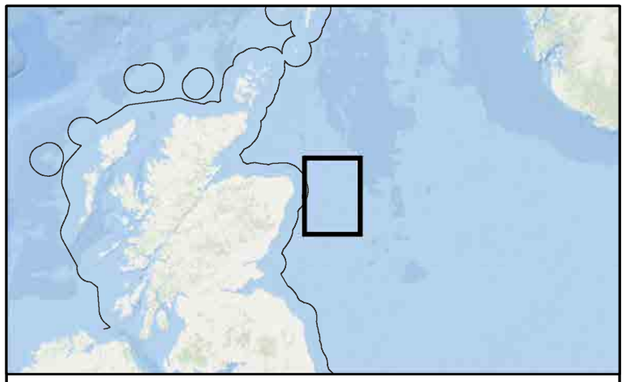

Legend:

- Array Area
- Offshore Export Cable Corridor
- ICES statistical rectangles
- 12 nm boundary

Demersal Otter Trawl Effort

Kilo Watt Hours (KWHr)

- 0 - 2,200.00
- 2,200.00 - 4,500.00
- 4,500.01 - 15,000.00
- 15,000.01 - 20,000.00
- 20,000.01 - 25,000.00
- 25,000.01 - 45,000.00
- 45,000.01 - 50,000.00
- 50,000.01 - 75,000.00
- 75,000.01 - 100,000.00
- 100,000.01 - 2,018,104.00

Project:	Report:
Muir Mhòr	Commercial Fisheries Chapter

Annual Demersal Otter Trawl Effort
UK and EU vessels 12m and over
2015 to 2020

Figure: 13.7	Drawing No: GoBe-0001		
Revision:	Date:	Drawn:	Checked:
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Map scale 1:1,000,000 @ A3

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Co-ordinate system: ETRS 1989 UTM Zone 30N **EPSG:** 25830

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HOOK AND LINE FISHERY

13.5.33. The hook and line or jigging fishery primarily targets mackerel and accounts for £245,000 first sales value landed annually from the local study area, compared to £631,000 from the regional study area.

13.5.34. In the local study area, activity is focused in the inshore areas from 0-3 nm. Landings by vessel deploying lines/jigging gear are made into Fraserburgh and Peterhead. Mackerel caught by line/jigging are targeted seasonally in July and August.

PELAGIC TRAWL FISHERY

13.5.35. The pelagic trawl fishery primarily targets herring and accounts for £1.9 million first sales value landed annually from the local study area, compared to £9.3 million from the regional study area. The pelagic fleet includes both pelagic trawl and purse seine nets.

KEY COMMERCIAL FISHERIES RECEPTORS

13.5.36. The key fleet métiers operating across the commercial fisheries local and regional study areas include (in no particular order):

- UK demersal otter trawlers targeting haddock and mixed demersal species;
- UK demersal seine targeting haddock and mixed demersal species;
- UK and non-UK (including Norwegian, French, Danish, Dutch and German) pelagic trawlers and purse seine targeting herring;
- UK scallop dredgers targeting king scallop;
- UK potting vessels targeting brown crab, lobster and velvet; and
- UK vessels deploying hook and lines targeting mackerel.

FUTURE BASELINE CONDITIONS

13.5.37. In line with the EIA Regulations, this EIAR requires a "*description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof without implementation of the project as far as natural changes from the baseline scenario can be assessed with reasonable effort, on the basis of the availability of environmental information and scientific knowledge*". This reflects how the baseline relevant to commercial fisheries is expected to evolve without the Proposed Development.

13.5.38. If the Proposed Development does not come forward, an assessment of the future baseline conditions has also been carried out and is described within this section. The likely evolution of the future baseline indicates that the haddock fishery targeted across the Proposed Development Array Area may become more important based on improved processing facilities and potential for increased quota due to the UK-exit from the EU.

13.5.39. Commercial fisheries patterns change and fluctuate based on a range of natural and management-controlled factors, including the following:

- Response to existing OWF developments, including Moray East, Moray West and Beatrice OWFs;
- Market demand: commercial fishing fleets respond to market demand, which is impacted by a range of factors, including the 2020 to 2021 COVID-19 pandemic;
- Market prices: commercial fishing fleets respond to market prices by focusing effort on higher value target species when prices are high and markets in demand;

- 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 new management for specific species where overexploitation has been identified, or changes in Total Allowable Catches (TACs) leading to the relocation of effort, and/or an overall increase/decrease of effort and catches from specific areas;
- 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, for example by moving from beam trawl to demersal seine; and
- Sustainability: with seafood buyers more frequently requesting certification of the sustainably of fish and shellfish products, such as the Marine Stewardship Council certification, industry is adapting to improve fisheries management and wider environmental impacts.

13.5.40. The variations and trends in commercial fisheries activity are an important aspect of the baseline assessment and forms the principal reason for considering up to 12 years of key baseline data (noting that data for 2011-2022 are presented in Volume 3, Appendix 13.1 (Commercial Fisheries Technical Baseline Report). Given the time periods assessed, the future baseline scenario would typically be reflected within the current baseline assessment undertaken. However, in this case, existing baseline data does not capture any potential changes in commercial fisheries activity resulting from the withdrawal of the UK from the EU.

13.5.41. Following the UK withdrawal from the EU, the UK and the EU have agreed to a Trade and Cooperation Agreement (TCA), applicable on a provisional basis from 01 January 2021. The TCA sets out fisheries rights and confirms that from 01 January 2021 and during a transition period until 30 June 2026, UK and EU vessels will continue to access respective EEZs, (12 nm to 200 nm) to fish. In this period, EU vessels will also be able to fish in specified parts of UK waters between 6 nm to 12 nm.

13.5.42. Over the five-year transition period 25% of the EU's fisheries quota in UK waters will be transferred to the UK; with 15% transferred in year one, most of this quota has already been transferred and distributed across the four nations of the UK. After the five-year transition there will be annual discussions on fisheries opportunities. Across the commercial fisheries regional study area, where UK fisheries primarily target non-quota shellfish species, it is expected that fleets are unlikely to be impacted by quota transfers. It is possible that UK vessels will seek to exploit additional quota-species opportunities, but fishing vessel owners would need to obtain the relevant quota allocation for that specific target species.

13.5.43. Market changes have the potential to impact fishing activity in the commercial fisheries regional study area; some of the catch landed by UK vessels is exported to EU markets (e.g. brown crab) and potential tariff/non-tariff barriers could affect which species are targeted and to what extent.

DATA LIMITATIONS AND ASSUMPTIONS

13.5.44. Limitations of landings data include the spatial size of ICES rectangles, which can misrepresent actual activity across the Proposed Development, and care is therefore required when interpreting the data.

13.5.45. It is noted that all commercial landings by UK registered vessels are subject to the Register of Buyers and Sellers (RBS) legislation and therefore landings by UK vessels of all lengths are recorded within the MMO iFish database. While it is recognised that there is no statutory requirement for owners of vessels 10 m and under to declare their catches, registered buyers are legally required to provide sales notes of all commercially sold fish and shellfish due to the 2005 Registration of Buyers and Sellers of First-Sale Fish Scheme (RBS legislation) (MMO, 2022a; 2023a). The RBS legislation is applicable to licenced fishing vessels of all lengths and requires name, port letters and numbers (PLN) of the vessel which landed the fish to be recorded in relation to each purchase. For the 10 m and under sector, landing statistics are recorded on sales notes provided by the registered buyers (MMO, 2022a; 2023a). Information that may not be formally recorded on the sales note, such as gear and fishing area, is added by coastal staff based on local knowledge of the vessels they administer - for example, from observations of the vessel during inspections at ports or from air and sea surveillance activities as well as discussions with the owner and/or operator of the vessel (MMO, 2022a; 2023a).

13.5.46. Lack of recent landings statistics for EU (non-UK) fleets is also recognised as a data limitation; based on the most recent European Commission data call, more recent (from 2017 onwards) landings data is no longer available by ICES rectangle. Data at a scale of ICES division (the whole of the North Sea) is less useful to understand fishing activity specific to the area overlapping the Proposed Development.

13.5.47. Limitations of VMS data are primarily focused on the coverage being limited to vessels ≥15m for MMO data. It is important to be aware that where mapped VMS data may appear to show inshore areas as having lower (or no) fishing activity compared with offshore areas, this is not necessarily the case, because VMS data does not include vessels typically operating in inshore areas (which typically comprises vessels <15m in length). To assist in mitigating the risk of under-representing smaller inshore vessels, site-specific marine traffic survey data, comprising information on vessel movements gathered by AIS and radar, has been analysed alongside VMS data.

13.5.48. Fishing vessel route density data from the EMSA is based on AIS data, representing activity for vessels with AIS (≥15 m in length). A limitation of AIS data is that it does not distinguish between steaming and actively fishing; nevertheless, it provides corroboration for key fishing grounds and insight into transit routes to alternative fishing grounds.

13.5.49. Data limitations have been managed by ensuring accurate interpretation of the data and clear understanding of its scope, together with cross-referencing between data sources and consultation with the fishing industry. As data forms only part of the evidence base, the limitations identified are not considered to significantly affect the certainty, or reliability, of the impact assessments in Section 13.7.

13.6. COMMERCIAL FISHERIES ASSESSMENT METHODOLOGY

13.6.1. Assessment of effects in this Chapter will follow the general approach outlined in Volume 1, Chapter 6 (Environmental Impact Assessment Methodology) of the EIAR.

13.6.2. Commercial fisheries specific assessment criteria and recognised guidance on assessing commercial fisheries are provided below.

CRITERIA FOR ASSESSMENT

13.6.3. The process for determining the significance of effects is a two-stage process that involves defining the magnitude of the potential impacts and the sensitivity of the receptors. This section describes the criteria applied in this chapter to assign values to the magnitude of potential impacts and the sensitivity of the receptors.

13.6.4. The terms used to define impact magnitude and receptor sensitivity for commercial fisheries are based on those described in further detail in Volume 1, Chapter 6 (Environmental Impact Assessment Methodology) of the EIAR.

MAGNITUDE

13.6.5. The magnitude criteria for commercial fisheries are provided in Table 13-4 and are based upon the technical expert's experience and judgement. In determining magnitude, each assessment considered the spatial extent, duration, frequency, and reversibility of impact and these are outlined within the magnitude section of each assessment of impact (e.g., a duration of hours or days would be considered for most receptors to be of short-term duration, which is likely to result in a low magnitude of impact).

Table 13-4 Impact Magnitude Criteria for commercial fisheries

Magnitude Value	Description
Negligible	Impact is expected to be undetectable compared to pre-development baseline conditions.
Low	Impact is expected to result in one or more of the following: • Minor loss of target fish or shellfish biological resource (e.g., minor loss of resource within Array Area); and • Minor loss of ability to carry on fishing activities (e.g., minor reduction of fishing effort within Array Area). And/or: Impact is of short-term duration (e.g., less than 2 years) and/or is of limited physical extent. The short-term time period is based on professional judgement and is not definitive dependant on the nature of the impact.
Medium	Impact is expected to result in one or more of the following: • Partial loss of target fish or shellfish biological resource (e.g., moderate loss of resource within Array Area); and • Partial loss of ability to carry on fishing activities (e.g., moderate reduction of fishing effort within Array Area). And/or: Impact is of medium-term duration (e.g., less than 12 years) and/or is of moderate physical extent.
High	Impact is expected to result in one or more of the following: • Substantial loss of target fish or shellfish biological resource (e.g., loss of substantial proportion of resource within Array Area); and • Substantial loss of ability to carry on fishing activities (e.g., substantial proportion of effort within Array Area). And/or: Impact is of long-term duration (e.g., greater than 12 years duration) and/or is of extended physical extent.

SENSITIVITY

13.6.6. The sensitivity criteria for commercial fisheries receptors are provided in Table 13-5.

Table 13-5 Receptor Sensitivity Criteria for commercial fisheries

Sensitivity Value	Description
Negligible	Receptor is not vulnerable to impacts that may arise from the project and/or has high recoverability. And/or: Extensive alternative fishing grounds available and/or fishing fleet is highly adaptive and resilient to change.
Low	Receptor is not generally vulnerable to impacts that may arise from the project and/or has high recoverability. And/or: 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
Medium	Receptor is somewhat vulnerable to impacts that may arise from the project and has moderate levels of recoverability. And/or: Moderate levels of alternative fishing grounds are available and/or fishing fleet has moderate operational range.
High	Receptor is highly vulnerable to impacts that may arise from the project and recoverability is long term or not possible. And/or: No alternative fishing grounds are available.

13.6.7. By assigning and combining magnitude and sensitivity criteria, overall effect significance upon commercial fisheries receptors can be determined (Table 13-6).

Table 13-6 Matrix Used for the Assessment of Significance of the Effect

MUIR MHÒR OFFSHORE WIND FARM A joint venture between Fred. Olsen Seawind & Vattenfall		Magnitude of Impact			
		Negligible	**Low**	**Medium**	**High**
Sensitivity of Receptor	**Negligible**	Negligible	Negligible	Negligible	Negligible
	Low	Negligible	Negligible or Minor	Minor	Minor
	Medium	Negligible	Minor	Moderate	Moderate
	High	Negligible	Minor	Moderate	Major

13.6.8. A level of effect of moderate or more will be considered a 'significant' effect for the purpose of the EIA. A level of effect of minor or less will be considered 'not significant'. Effects of moderate significance or above are therefore considered important in the decision-making process, whilst effects of minor significance or less warrant little, if any, weight in the decision-making process.

13.6.9. With respect to assessment of effects to protected features in a Nature Conservation (nc) MPA (hereafter termed as an MPA), a dedicated MPA assessment has been conducted for the Proposed Development, see Volume 3, Appendix 9.2 (Marine Protected Area Assessment Report). Specific consideration of MPAs is required for consent under section 83 of the Marine (Scotland) Act 2010. The objective of the MPA assessment is to determine if the Proposed

Development may result in significant effects on an MPA, and/or any ecological or geomorphological process on which the conservation of any protected feature in an MPA relies.

EMBEDDED COMMITMENTS

13.6.10. As part of the project design process, several designed-in measures have been proposed to reduce the potential for impacts on environmental receptors. As there is a commitment to implementing these measures, they are considered inherently part of the design of the Proposed Development and have therefore been considered in the assessment (i.e., the determination of magnitude and therefore significance assumes implementation of these measures). These measures are considered standard industry practice for this type of development. The embedded commitments relevant to Commercial Fisheries are presented in Table 13-7.

13.6.11. The embedded commitments (C-02, C-03, C-07 to C-27, C-29, C-30, C-32, C-33 and C-36) collectively aim to mitigate the impact of the Proposed Development on commercial fisheries receptors. Commitments such as the development of a Cable Plan (C-01), cable burial (C-29) and cable protection monitoring (C-32) safeguard seabed integrity and ensure that after installation fishing resumption is optimal. Adherence to a Fisheries Management and Mitigation Strategy (FMMS) (C-11), ongoing liaison (C-12), following best practice guidance (C-13)and advance warning (C-19) will ensure that the fishing industry are kept fully informed of activities and works related to the Proposed Development. The application of safety zones (C-17), use of guard vessels where appropriate (C-18), aids to navigation (C-24) and appropriate marking (C-25) will ensure that any fisheries activities will resume safely.

Table 13-7 Embedded Commitment Measures of relevance to Commercial Fisheries

Code	Commitment	Type (Primary, Secondary or Tertiary)	How Commitment Secured
C-02	Development of and adherence to a Cable Plan (CaP). The CaP will confirm planned cable routing, installation methods, cable specifications and any additional protection and any post-installation monitoring.	Tertiary	CaP
C-03	Development of and adherence to a Development Specification and Layout Plan (DSLP). The DSLP will confirm layout and relevant design parameters.	Tertiary	DSLP
C-04	The infrastructure will be designed in such a way to minimise the impacts and will be within the key parameters set out in the EIA Project Description and EIAR.	Primary	DSLP
C-07	All dropped objects will be reported. Where recovery is possible and the dropped object may cause a hazard, object will be retrieved.	Tertiary	Environmental Management Plan (EMP).
C-08	Development of and adherence to an EMP. This will set out mitigation measures and procedures relevant to environmental management, including but not limited to chemical usage, invasive and non-native species, pollution prevention and waste management.	Tertiary	EMP
C-09	Development of and adherence to a Decommissioning Programme (DP). The DP will outline measures for the decommissioning of the	Tertiary	DP

Code	Commitment	Type (Primary, Secondary or Tertiary)	How Commitment Secured
	Proposed Development.		
C-10	Development of and adherence to an Environmental Management Plan (EMP). (VMNSP). The VMNSP will confirm the types and numbers of vessels that will be engaged on the Proposed Development and consider vessel coordination including indicative transit route planning.	Tertiary	VMNSP
C-11	Development of and adherence to a Fisheries Management and Mitigation Strategy (FMMS). The FMMS will set out the means of ongoing fisheries liaison through construction and operation and maintenance (O&M) phases of the Proposed Development and detail any mitigation measures of relevance to commercial fisheries to be put in place.	Tertiary	FMMS
C-12	Ongoing liaison with fishing fleets will be maintained during construction, maintenance and decommissioning operations via an appointed Fisheries Liaison Officer and Fishing Industry Representative.	Tertiary	FMMS
C-13	Adherence to best practice guidance with regards to fisheries liaison and procedures in the event of interactions between the Proposed Development and fishing activities (e.g., FLOWW, 2014; 2015).	Tertiary	FMMS
C-14	Development of and adherence to a Piling Strategy (PS) (applicable where piling is undertaken). The PS will detail the method of pile installation and associated noise levels. It will describe any mitigation measures to be put in place (e.g., soft starts and ramp ups, use of Acoustic Deterrent Devices) during piling to manage the effects of underwater noise on sensitive receptors.	Tertiary	PS
C-15	Development of and adherence to Marine Mammal Mitigation Plan (MMMP). This will identify appropriate mitigation measures during offshore activities that are likely to produce underwater noise and vibration levels capable of potentially causing injury or disturbance to marine mammals. This will be developed alongside the Piling Strategy and referred to in European Protected Species (EPS) licence applications.	Tertiary	MMMP
C-16	Development of and adherence to VMNSP. The VMNSP will describe measures put in place by the Proposed Development related to navigational safety, including information on Safety Zones, charting, construction buoyage, temporary lighting and marking, and means of notification of Proposed Development activity to other sea users (e.g., via Notifications to Mariners).	Tertiary	VMNSP
C-17	Applications to be made, where appropriate, for Safety Zones (500m) for construction and major maintenance works, and for pre commissioning works (50m).	Tertiary	Energy Act 2004 and Electricity (Offshore Generating Stations) (Safety

Code	Commitment	Type (Primary, Secondary or Tertiary)	How Commitment Secured
			Zones) (Application Procedures and Control of Access) Regulations 2007
C-18	Use of guard vessels where deemed appropriate to ensure adherence with Safety Zones or advisory passing distances, as defined by risk assessment, to mitigate any impact which poses a risk to surface navigation during construction, maintenance and decommissioning phases. Such impacts may include partially installed structures or cables, extinguished navigation lights or other unmarked hazards.	Tertiary	VMNSP
C-19	Advance warning and accurate location details of construction, maintenance and decommissioning operations, associated Safety Zones and advisory passing distances will be given via Notifications to Mariners and Kingfisher Bulletins.	Tertiary	VMNSP
C-20	Participation in any fisheries working group to assist with liaison between the Proposed Development and the fishing community.	Tertiary	FMMS
C-21	Compliance with Maritime and Coastguard Agency (MCA) Marine Guidance Note (MGN) 654 (MCA, 2024) and its annexes where applicable (including consideration of a Search and Rescue (SAR) checklist, an Emergency Response and Cooperation Plan (ERCoP) and Under Keel Clearance.	Tertiary	CaP Construction Method Statement (CMS) DSLP
C-22	Compliance of all project vessels with international marine regulations as adopted by the Flag State, notably the International Regulations for Preventing Collisions at Sea (COLREGs) (IMO, 1974) and the International Convention for the Safety of Life at Sea (SOLAS) (IMO, 1974).	Tertiary	VMNSP
C-23	Notification of damage or decay to cables to the Maritime and Coastguard Agency (MCA), Northern Lighthouse Board (NLB) Kingfisher and UK Hydrographic Office (UKHO) within 24 hours of discovery.	Tertiary	CaP VMNSP
C-24	Aids to navigation (marking and lighting) will be deployed in accordance with the latest relevant available standard industry guidance and as advised by Northern Lighthouse Board (NLB), MCA and Civil Aviation Authority (CAA) and MoD as appropriate. This will include a buoyed construction area around the Array area in consultation with NLB and all Aids to navigation will be subject to an Aids to Navigation Management Plan undertaken post consent.	Tertiary	VMNSP Lighting and Marking Plan (LMP) Aids to Navigation Management Plan
C-25	Appropriate marking of the Proposed Development on Admiralty and aeronautical charts. This will include provision of the positions and heights of structures to the UK Hydrographic Office (UKHO),	Tertiary	VMNSP LMP

Code	Commitment	Type (Primary, Secondary or Tertiary)	How Commitment Secured
	Civil Aviation Authority (CAA), Ministry of Defence (MoD) and Defence Geographic Centre (DGC).		
C-26	Compliance with regulatory expectations on moorings for floating wind and marine devices published by Maritime and Coastguard Agency (MCA) and the Health and Safety Executive (HSE).	Tertiary	CMS
C-27	Crossing and proximity agreements with known existing pipeline and cables operators will be sought.	Tertiary	Secured by commercial agreements with pipeline and cable operators.
C-29	Where practicable, cable burial will be the preferred means of cable protection. Cable burial will be informed by the cable burial risk assessment (CBRA) and detailed within the CaP. In areas where CBRA deems burial not feasible, suitable implementation and monitoring of cable protection will be employed.	Primary	CaP
C-30	Adherence to the Supply Chain Development Statement (SCDS) in relation to local manufacturers and contractors.	Tertiary	SCDS
C-32	Cable protection surveys of offshore export cables will be undertaken post construction where mechanical protection of cables laid on the seabed has been deployed. This may include over-trawl surveys and/or side-scan sonar. Cable monitoring of offshore export cables will be undertaken post construction to monitor electromagnetic fields (EMF).	Tertiary	CaP PEMP
C-33	Minimum blade clearance of 30 m above Mean Sea Level (MSL).	Primary	DSLP CMS
C-36	Development of and adherence to an LMP. The LMP will confirm compliance with legal requirements with regards to shipping, navigation and aviation marking and lighting.	Tertiary	LMP
C-38	Development of and adherence to a Project Environmental Monitoring Programme (PEMP), which will set out commitments to environmental monitoring in pre-, during and post-construction phases.	Tertiary	PEMP
C-40	Development of and adherence to a Wet Storage Plan (WSP) to provide details on requirements (if applicable) for assembled WTGs and cabling.	Tertiary	WSP
C-42	Lighting and marking failures appropriately reported/rectified as soon as possible and interim hazard warnings put in place as required.	Tertiary	LMP

IMPACTS SCOPED OUT OF THE ASSESSMENT

13.6.12. None of the potential impacts identified for commercial fisheries have been scoped out of the assessment during EIA scoping.

WORST CASE DESIGN SCENARIO

13.6.13. The Developer has adopted a design envelope approach to impact assessment (also known as a 'Rochdale Envelope'). In line with guidance from the Scottish Government (2022), the design envelope approach offers flexibility in the EIA process by enabling impact assessment to be carried out against several potential design options.

13.6.14. The assessment of commercial fisheries impacts has been undertaken with respect to the details provided in Volume 1, Chapter 3 (Project Description). A 'worst case' design scenario has been selected for each impact which would lead to the greatest impact for all receptors or receptor groups, when selected from a range of values. Effects of greater adverse significance are not predicted to arise should any other development scenario, based on details within Volume 1, Chapter 3 (Project Description) (e.g., different infrastructure layout), to that assessed here, be taken forward in the final design scheme.

13.6.15. Table 13-8 presents the worst-case design scenario for each impact associated with LSE assessment on commercial fisheries, along with justification.

Table 13-8 Worst Case Design Scenarios with respect to the Commercial Fisheries Assessment.

Impact	Embedded Commitment	Worst Case Design Scenario	Justification
Construction			
Impact 1: Reduction in access to, or exclusion from established fishing grounds from within the Array Area	C-02, C-09, C-10, C- 11, C-12, C-13, C-16, C17, C-18, C-19, C-20, C-21, C-22, C-24, C- 26, C-29, C-36, C-38, C-42	Construction period: approximately four years in a single phase; and Total Array Area: 200 km^2. **Safety zones:** • 500 m safety zones around construction activities; and • 50 m safety zones around partially complete structures or complete structures. **WTGs** • Maximum number of wind turbines: 67; • Number of floating foundations: 67; • Foundation surface dimension: 150 m x 140 m; • Maximum operational draught: 50 m; • Total area occupied by floating platform/WTGs: 16,000 m^2 and • Minimum turbine spacing: 1,000 m. **Mooring parameters** • Maximum 12 mooring lines per WTG for all mooring arrangement options (maximum 804 mooring lines total where tension lines are used, 603 mooring lines where catenary, semi-taut or taut lines are used) • Maximum mooring line radius: 1,500 m (except for tension morning lines: 200 m) • Maximum mooring line length 1,600 m for catenary (1550 m for semi-taut, 1500 m for taut and less than 200 m for tension lines) Mooring lines material: chain, wire, synthetic rope or combination • Maximum mooring line diameter: 190 mm for top/bottom chain, 450 mm for synthetic rope, 250 mm for wire rope • Total maximum lateral cross-section of the mooring system in the water column: 10,800 m^2 x 67 WTGs = 723,600 m^2 • Proportion of mooring radius compared to total Array Area: up to 100%. **OEP(s)** • Maximum number of OEP(s): two (within the Array Area), including: • Two OEP(s) of length x width: 60 m x 50 m; • Piled jacket foundation, with up to six legs per foundation; and • 2 HVAC OEP(s) on jacket foundations = 7,200m^2 (1 OEP has footprint of 60x60m = 3,600m^2) • Maximum scour protection area of 2x OEP(s) = 36,000 m^2. **Scour protection (of moorings and anchors)** • Scour protection material: rock, rock bags or frond mats; • Scour protection footprint per foundation: 11,000 m^2; • Total scour protection for the Array Area: 737,000 m^2. **Inter-array cables** • Inter-array cable installation method = Jetting • Cable burial (tether-wave, free lay): 0 m • Cable protection (tether-wave, buried): up to 250 km, with total protection footprint: 500,000 m^2. • Total IAC length on seabed = 250 km	The worst case design scenario represents the maximum duration and extent of fishing exclusion throughout the construction phase and, hence, the greatest potential to restrict access to fishing grounds. It is assumed that construction activities could occur anywhere within the Array Area at any given time. It is therefore assumed that fishing is not prohibited from resumption but is unlikely to resume within the Array Area throughout the construction phase.

Impact	Embedded Commitment	Worst Case Design Scenario	Justification
		• IAC cable seabed width = 3 m • IAC cable burial depth = 2 m • IAC trench cross sectional area = 6 m^2 • Assuming 30% of material is forced into suspension in the water column • Maximum sediment disturbance volume = 250,000 m x 6 m^2 = 1,500,000 m^2 x 0.3 (spill factor) = 450,000 m^3 • Assumed maximum installation rate of up to 700 m/hr **OEP Interconnector Cable** • Interconnector cable installation method = Jetting • Total length of Interconnector cable 3 km • Interconnector cable seabed width = 3 m • Interconnector cable burial depth = 4 m (excludes burial in sandwaves of up to 20 m) • Interconnector cable trench cross sectional area = 12 m^2 • Assuming 30% of material is forced into suspension in the water column • Maximum sediment disturbance volume = 3,000 m x 12 m^2 x 0.3 (spill factor) = 10,800 m^3 • Assumed maximum installation rate of up to 700 m/hr **IAC Junction Box Installation = 1,800 m^2** • Max Dimensions (L x W x H) = 15 x 6 x 4 m • Seabed Footprint per unit = 90 m^2 • Max Number of Units = 20 • Total Seabed Footprint within Array = 90 * 20 = 1,800 m^2 • Anchoring method = ballast/weight of the unit itself, no additional anchoring planned	
Impact 2: Reduction in access to, or exclusion from established fishing grounds from within the ECC	C-02, C-09, C-10, C- 11, C-12, C-13, C-16, C17, C-18, C-19, C-20, C-21, C-22, C-24, C- 26, C-29, C-36, C-38, C-42	Construction period: approximately four years in a single phase. **Safety zones:** • 500 m safety zones around construction activities. **Export cables** • Total export cable length: 270 km; • Burial technique: ploughing, jet trenching, mechanical trenching, mass flow excavations; • Up to three cables, each of up to 90 km in length, with total length of 270 km and spacing of 250 m between cables; • Minimal burial depth: subject to Cable Burial Risk Assessment (CBRA); • Maximum burial depth of 4 m; • Maximum sediment disturbance volume = 270 km x 12 m^2 x 0.3 (spill factor) = 972,000 m^3 **Cable protection** • Up to 50% of the length of the cables may require cable protection including: rock placement, concrete mattresses, grout/rock bags, frond mattresses. • Total export cable protection footprint: worst case scenario is 50% of 270 km length of cable to be protected at a width of 3 m = 135,000 * 3 = 405,000 m^2 (or 0.405 km^2).	The worst case design scenario represents the maximum duration and extent of fishing exclusion throughout the construction phase and, hence, the greatest potential to restrict access to fishing grounds. It is assumed that construction activities would not occur across the entirety of the ECC at any one time. Therefore, it is assumed that fishing is not prohibited from resumption in areas where construction has not yet commenced or is completed.
Impact 3: Displacement leading to gear conflict and increased fishing pressure on adjacent grounds	C-09, C-10, C-11, C- 12, C-13, C-16, C17, C- 18, C-19, C-20, C-21, C-22, C-24, C-26, C- 36, C-38, C-42	As described for Impacts 1 and 2: “reduction in access to, or exclusion from established fishing grounds” for both the Array Area and ECC.	The worst case design scenario represents the maximum duration and extent of fishing exclusion throughout the construction phase and, hence, the greatest potential to lead to displacement of fishing effort.
Impact 4: Disturbance of commercially important fish and shellfish resources leading to displacement or disruption of fishing activity	C-08, C-09, C-14, C- 15, C-38	As described for Volume 2, Chapter 10 (Fish and Shellfish Ecology).	The worst case design scenario for fish and shellfish ecology receptors represents the maximum potential disturbance to commercial fisheries resources.

Impact	Embedded Commitment	Worst Case Design Scenario	Justification
Impact 5: Increased vessel traffic associated with the Proposed Development within fishing grounds leading to interference with fishing activity	C-09, C-10, C-11, C- 12, C-13, C-16, C-17, C-18, C-19, C-20, C- 21, C-22, C-24, C-26, C-36, C-42	Maximum number of return trips for vessels over the construction period: 1,711. Maximum number of vessels on site at one time over the construction period: 21. Realistic number of vessels expected to be on site at the same time: 10.	The maximum number of wind turbines and associated infrastructure will lead to the highest level of construction activities and therefore highest level of construction vessel round trips. The maximum number of vessels transits and the maximum duration of the construction would result in the greatest potential for interference.
Impact 6: Additional steaming to alternative fishing grounds for vessels that would otherwise fish within the Proposed Development	C-09, C-10, C-11, C- 12, C-13, C-16, C-17, C-18, C-19, C-20, C-21, C-22, C-24, C-26, C-36, C-42	As described for Impacts 1 and 2: “reduction in access to, or exclusion from established fishing grounds” for both the Array Area and ECC.	The worst case design scenario represents the maximum duration and extent of fishing exclusion throughout the construction phase and, hence, the greatest potential for additional steaming to alternative fishing grounds.
Impact 7: Increased snagging risk, which could result in loss or damage to fishing gear	C-03, C-07, C-10, C- 11, C-12, C-13, C-16, C-17, C-18, C-19, C- 20, C-21, C-22, C-23, C-24, C-25, C-26, C- 32, C-36, C-42	As described for Impacts 1 and 2: “reduction in access to, or exclusion from established fishing grounds” for both the Array Area and ECC.	The worst case design scenario represents the maximum number and extent of project infrastructure being constructed and, hence, the greatest potential for gear snagging to occur.
Operation and Maintenance			
Impact 8: Reduction in access to, or exclusion from established fishing grounds from within the Array Area	C-02, C-10, C-11, C- 12, C-13, C-16, C-17, C-18, C-19, C-20, C- 21, C-22, C-23, C-24, C-25, C-26. C-29, C- 32, C-36, C-38, C-42	Operational lifetime: 35 years **WTGs** • Maximum number of wind turbines: 67; • Number of floating foundations: 67; • Foundation surface dimension: 150 m x 140 m; • Depth of structure in the water column: 50 m; • Total area occupied by floating platform/WTGs: 16,000 m^2; and • Minimum turbine spacing: 1,000 m. **Mooring parameters** • Maximum 12 mooring lines per WTG for all mooring arrangement options (maximum 804 mooring lines total where tension lines are used, 603 mooring lines where catenary, semi-taut or taut lines are used) • Maximum mooring line radius: 1,500 m (except for tension morning lines: 200 m) • Maximum mooring line length 1,600 m for catenary (1550 m for semi-taut, 1500 m for taut and less than 200 m for tension lines) Mooring lines material: chain, wire, synthetic rope or combination • Maximum mooring line diameter: 190 mm for top/bottom chain, 450 mm for synthetic rope, 250 mm for wire rope • Total maximum lateral cross-section of the mooring system in the water column: 10,800 m^2 x 67 WTGs = 723,600 m^2 • Proportion of mooring radius compared to total Array Area: up to 100%. **OEP(s)** • Maximum number of OEP(s): two (within the Array Area), including: • Two OEP(s) of length x width: 60 m x 50 m; • Piled jacket foundation, with up to six legs per foundation and • Total seabed footprint of 7,200 m^2 , plus maximum scour protection area of 3,600 m^2. • OEP Scour Protection 2 x OEP(s) = 12,800 m^2 **Scour protection (of moorings and anchors)** • Scour protection material: rock, rock bags or frond mats; • Scour protection footprint per foundation: 11,000 m^2;	The worst case design scenario represents the maximum duration and extent of fishing exclusion throughout the operation and maintenance phase and hence the greatest potential to restrict access to fishing grounds. Given the mooring line radius of 1,500 m and minimum turbine spacing of 1,000 m, it is assumed that fishing is not prohibited from resumption but is unlikely to resume within the Array Area throughout the operation and maintenance phase.

Impact	Embedded Commitment	Worst Case Design Scenario	Justification
		• Total scour protection for the wind farm site area: 737,000 m^2. **Inter-array cables = 5,025 m^2** • Minimum external cable diameter: 150 mm. • Maximum external cable diameter: 250 mm • Using max diameter, total surface area assuming 67 x 300 m IAC in water column = 5,025 m^2 • The presence of the moorings and dynamic cables will be restricted to the Array Area only. **IAC Junction Box = 1,200 m^2** • Max Dimensions (L x W x H) = 15 x 6 x 4 m • Cross section in water column = 15 m x 4 m = 60 m^2 • Max Number of Units = 20 • Total cross section of units = 20 x 60 m^2 = 1,200 m^2 **Maintenance activities** • 500 m safety zones around major maintenance activities; • WTG routine inspections: six visits per turbine per year for routine maintenance, plus eight visits per turbine per year for troubleshooting; • Inter-array cable repair: seven over the lifetime of project, with replacements of up to 7 km each across 5 m of seabed; and • OEP routine maintenance: three visits per year.	
Impact 9: Reduction in access to, or exclusion from established fishing grounds from within the ECC	C-02, C-10, C-11, C- 12, C-13, C-16, C-17, C-18, C-19, C-20, C- 21, C-22, C-23, C-24, C-25, C-26. C-29, C- 32, C-36, C-38, C-42	Operational lifetime: 35 years **Export cables** • Up to three cables, each of up to 90 km in length, with total length of 270 km and spacing of 250 m between cables; • Maximum burial depth of 4 m; • Minimal burial depth: subject to CBRA; • Up to 50% of the length of the cables may require cable protection including: rock placement, concrete mattresses, grout/rock bags, frond mattresses. **Maintenance activities** • 500 m safety zones around major maintenance activities; • One failure per cable per five years.	The worst case design scenario represents the maximum duration and extent of fishing exclusion throughout the operation and maintenance phase and hence the greatest potential to restrict access to fishing grounds. Given the burial of the export cable, it is assumed that fishing will resume throughout the operation and maintenance phase, with exception of safety zones around major maintenance activities.
Impact 10: Displacement leading to gear conflict and increased fishing pressure on adjacent grounds	C-10, C-11, C-12, C- 13, C-16, C-17, C-18, C-19, C-20, C-21, C- 22, C-23, C-24, C-25, C-26, C-32, C-36, C- 38, C-42	As described for Impacts 8 and 9: “reduction in access to, or exclusion from established fishing grounds” for both the Array Area and ECC.	The worst case design scenario represents the maximum duration and extent of fishing exclusion throughout the operational phase and, hence, the greatest potential to lead to displacement of fishing effort.
Impact 11: Disturbance of commercially important fish and shellfish resources leading to displacement or disruption of fishing activity	C-08, C-38	As described for Volume 2, Chapter 10 (Fish and Shellfish Ecology).	The worst case design scenario for fish and shellfish ecology receptors represents the maximum potential disturbance to commercial fisheries resources.
Impact 12: Increased vessel traffic associated with the Proposed Development within fishing grounds leading to interference with fishing activity	C-10, C-11, C-12, C- 13, C-16, C-17, C-18, C-19, C-20, C-21, C- 22, C-23, C-24, C-25, C-26, C-32, C-36, C-42	Maximum number of return trips for operation and maintenance period: 259. Maximum number of vessels on site at one time for operation and maintenance period: 11.	The maximum number of wind turbines and associated infrastructure will lead to the highest level of maintenance activities and therefore highest level of maintenance vessel round trips.

Impact	Embedded Commitment	Worst Case Design Scenario	Justification
Impact 13: Additional steaming to alternative fishing grounds for vessels that would otherwise fish within the Proposed Development	C-10, C-11, C-12, C- 13, C-16, C-17, C-18, C-19, C-20, C-21, C- 22, C-23, C-24, C-25, C-26, C-32, C-36, C-42	As described for Impacts 8 and 9: “reduction in access to, or exclusion from established fishing grounds” for both the Array Area and ECC.	The worst design scenario represents the maximum duration and extent of fishing exclusion throughout the operational phase and, hence, the greatest potential for additional steaming to alternative fishing grounds.
Impact 14: Physical presence of infrastructure and potential exposure of that infrastructure leading to gear snagging	C-03, C-07, C-10, C- 11, C-12, C-13, C-16, C-17, C-18, C-19, C- 20, C-21, C-22, C-23, C-24, C-25, C-26, C- 32, C-36, C-42	As described for Impacts 8 and 9: “reduction in access to, or exclusion from established fishing grounds” for both the Array Area and ECC.	The worst case design scenario represents the maximum number and extent of project infrastructure and, hence, the greatest potential for gear snagging to occur.
Decommissioning			
Impact 15: Reduction in access to, or exclusion from established fishing grounds from within the Array Area	C-02, C-09, C-10, C- 11, C-12, C-13, C-16, C17, C-18, C-19, C-20, C-21, C-22, C-24, C- 26, C-29, C-36, C-38, C-42	Decommissioning is likely to include removal of all of the wind turbine components and part of the foundations (those above seabed level) and removal of all other surface infrastructure. Some or all of the array cables, interconnector cables, and offshore export cables may be removed. Scour and cable protection would likely be left *in situ*. The removal of cables and rock protection is considered the worst case design scenario, however the necessity to remove cables and rock protection will be reviewed at the time of decommissioning. In the absence of detailed methodologies and schedules, decommissioning works and associated implications for commercial fisheries are considered analogous with those assessed for the construction phase.	The scenario which represents the potential for the maximum level of infrastructure to be decommissioned.
Impact 16: Reduction in access to, or exclusion from established fishing grounds from within the ECC	C-02, C-09, C-10, C- 11, C-12, C-13, C-16, C17, C-18, C-19, C-20, C-21, C-22, C-24, C- 26, C-29, C-36, C-38, C-42	As described for Impact 15: “reduction in access to, or exclusion from established fishing grounds from within the Array Area”.	The scenario which represents the potential for the maximum level of infrastructure to be decommissioned.
Impact 17: Displacement leading to gear conflict and increased fishing pressure on adjacent grounds	C-09, C-10, C-11, C- 12, C-13, C-16, C17, C- 18, C-19, C-20, C-21, C-22, C-24, C-26, C- 36, C-38, C-42	As described for Impact 15: “reduction in access to, or exclusion from established fishing grounds from within the Array Area”.	The scenario which represents the potential for the maximum level of infrastructure to be decommissioned.
Impact 18: Disturbance of commercially important fish and shellfish resources leading to displacement or disruption of fishing activity	C-08, C-09, C-14, C- 15, C-38	As described for Volume 2, Chapter 10 (Fish and Shellfish Ecology).	The scenario which represents the potential for the maximum level of infrastructure to be decommissioned.
Impact 19: Increased vessel traffic associated with the Proposed Development within fishing grounds leading to interference with fishing activity	C-09, C-10, C-11, C- 12, C-13, C-16, C-17, C-18, C-19, C-20, C- 21, C-22, C-24, C-26, C-36, C-42	As described for Impact 15: “reduction in access to, or exclusion from established fishing grounds from within the Array Area”.	The scenario which represents the potential for the maximum level of infrastructure to be decommissioned.
Impact 20: Additional steaming to alternative fishing grounds for vessels that would otherwise fish within the Proposed Development	C-09, C-10, C-11, C- 12, C-13, C-16, C-17, C-18, C-19, C-20, C-21, C-22, C-24, C-26, C-36, C-42	As described for Impact 15: “reduction in access to, or exclusion from established fishing grounds from within the Array Area”.	The scenario which represents the potential for the maximum level of infrastructure to be decommissioned.
Impact 21: Increased snagging risk, which could result in loss or damage to fishing gear	C-03, C-07, C-10, C- 11, C-12, C-13, C-16, C-17, C-18, C-19, C- 20, C-21, C-22, C-23, C-24, C-25, C-26, C- 32, C-36, C-42	As described for Impact 15: “reduction in access to, or exclusion from established fishing grounds from within the Array Area”.	The scenario which represents the potential for the maximum level of infrastructure to be decommissioned.

13.7. ASSESSMENT OF LIKELY SIGNIFICANT EFFECTS

13.7.1. Assessment of LSE on commercial fisheries has been undertaken for all phases of the Proposed Development. A detailed description of each impact, informed by Volume 1, Chapter 3 (Project Description), baseline information and various analytical methods including modelling is provided below.

CONSTRUCTION PHASE

IMPACT 1 REDUCTION IN ACCESS TO, OR EXCLUSION FROM ESTABLISHED FISHING GROUNDS WITHIN THE ARRAY AREA

13.7.2. This impact relates to the reduction in access to or exclusion from established fishing grounds within the Array Area due to construction activities related to the installation of the WTGs, floating foundations and their associated mooring and anchoring systems and OEP(s) with piled jacket foundations, and the installation of inter-array and interconnector cables.

MAGNITUDE OF IMPACT

13.7.3. During construction of the Array Area, associated infrastructure and cabling, commercial fisheries will be prevented from fishing where construction activities are taking place, plus 500 m safety zones around structures where active construction works are ongoing, and otherwise 50 m safety zones around partially complete structures or complete structures yet to be operational. In addition, it is recommended and assumed that up to 500 m advisory safe passing distance for mobile installation vessels will be in place. The total construction duration for the Array Area is anticipated to be four years, with construction activities occurring anywhere within the Array Area at any given time and a number/range of construction activities being undertaken simultaneously. It is assumed that the construction will be undertaken in a single phase.

13.7.4. The assumptions around potential access to fishing grounds within the Array Area throughout the construction phase is paramount to the commercial fisheries impact assessment. A buoyed construction area will be implemented around construction activities and with a single phase of construction, it is feasible that this buoyed construction area could surround the entirety of the Array Area throughout the anticipated four-year period. Given that construction activities and project infrastructure (including subsea and above surface) could be located anywhere within the Array Area at any given time, it is assumed that fishing is not likely to resume within the Array Area. It is highlighted that fishing is not legally prohibited within the Array Area, but is unlikely to be practically possible given the catenary mooring lines and anchoring system of floating foundations which will occupy up to 100% of the Array Area.

13.7.5. This impact will lead to loss of access to fishing grounds and access to the fish and shellfish resources within these grounds for a range of fishing opportunities during the construction phase, which will directly affect fleets over a medium-term duration (i.e. greater than two years and less than 12 years). The impact is predicted to be continuous throughout the construction phase with loss of access to the entirety of the 200 km^2 Array Area during the single phase of construction.

13.7.6. In terms of the area impacted by construction activities, in total a maximum of 7.7 km^2 of seabed will be temporarily disturbed during seabed preparation activities and installation of inter-array and interconnector cables (which equates to 3.8% of the total Array Area); and a mooring line cross-sectional area of 7 km^2 per wind turbine (which for 67 foundations equates to up to 100% of the total Array Area). In addition, there will be 500 m safety zones around structures under construction (equating to 0.79 km^2 per structure) and 500 m advisory safe passing distances for mobile installation vessels (equating to 0.79 km^2 per vessel).

13.7.7. The impact is of relevance to international fishing fleets and is described below on a fishery-by-fishery basis.

13.7.8. **UK demersal otter trawl:** consultation with the commercial fishing industry has highlighted the importance of the Array Area to demersal otter trawl fisheries, specifically pair trawling vessels targeting haddock and whiting and also catching mackerel and mixed demersal species. The local study area encompasses four ICES rectangles and the Array Area is entirely located within ICES rectangle 43E9. The areal overlap of the Array Area (200 km^2) with ICES rectangle 43E9 (3,360 km^2) is approximately 6%. Landing statistics indicate a recent annual average value landed from ICES rectangle 43E9 of £1.8 million haddock (based on 2021 and 2022 landings; compared with the pre-Brexit average from 2011-2015 of £1.6 million, and a five-year average from 2018-2022 of £1 million) and £114,000 whiting (based on 2021 and 2022 landings; compared with the pre-Brexit average from 2011-2015 of £58,000, and a five-year average from 2018-2022 of £59,000).

13.7.9. Vessel monitoring system (VMS) data from the MMO shows demersal otter trawl activity (including single, twin and pair trawling) within ICES rectangle 43E9 occurring primarily immediately south of the Array Area and 10-20 km to the east of the Array Area. Limited activity is shown within the Array Area, see Volume 3, Appendix 13.1 (Commercial Fisheries Technical Report) Figures 7.8 and 7.9). This is corroborated by surface swept area data collated by ICES for demersal otter trawl vessels, indicating activity to the south and south-east, with high fishing intensity located to the north of the Array Area, within ICES rectangle 44E9, see Volume 3, Appendix 13.1 (Commercial Fisheries Technical Report) Figure 7.10. Consultation with the fishing industry indicates that this MMO and ICES VMS datasets do not accurately represent the activity of demersal otter pair trawling vessels in the vicinity of the Array Area.

13.7.10. Amalgamated VMS intensity data for demersal mobile trawl fisheries from 2009-2013 shows activity across the west, south-west and southern sections of the Array Area (Figure 13.5). This data was presented to the commercial fishing industry and considered to be a closer representation of activity by the demersal otter pair-trawl vessels. Further evidence has been provided by the commercial fishing industry, including plotter data and landing records of tonnage and value by species for a 5-year period (2019 to 2023). This data is considered important evidence to inform the impact assessment, however, is confidential in nature given that it is pertaining to individual vessels.

13.7.11. Based on the assumption that fishing will not resume within the Array Area during the entirety of the construction phase, the UK demersal otter trawl fleet, including pair-trawl vessels, would be directly impacted with the loss of the ability to fish across establish grounds that overlap the Array Area. Overall, the impact during construction is predicted to be of medium-term duration, to directly affect the fishery which has a high value within the Array Area and which is specifically targeted across grounds that overlap the Array Area as evidenced by landing statistics, amalgamated VMS fishing intensity for demersal mobile gear and fishing industry plotter data (Volume 3, Appendix 13.1 (Commercial Fisheries Technical Report)); therefore, the magnitude is considered to be high adverse.

13.7.12. **UK demersal seine:** landing statistics indicate a recent annual average value landed from ICES rectangle 43E9 by demersal seine gear of £377,000 (based on 2021 and 2022 landings; compared with an average of £186,000 from 2016-2022, noting that data pre-2016 was not reported separately for demersal seine). Key target species are haddock, whiting and plaice. Spatial activity indicated fishing intensity by demersal seines is focused north of the Array Area and in an area approximately 22 km south-east of the Array Area. Industry consultation highlights that recent developments in new facilities specifically for processing smaller size class of haddock is likely to lead to an increase of fishing intensity in the area by this fleet sector. The processing facilities include automated filleting of smaller fish (above minimum

conservation reference size) and onward sale into value-added products. It is therefore feasible that this fishery could return in the near future and be targeted in the inshore areas

13.7.13. Based on the assumption that fishing will not resume within the Array Area during the entirety of the construction phase, the UK demersal seine fleet would be directly impacted with the loss of the ability to fish across the Array Area. Overall, the impact during construction is predicted to be of medium-term duration, to directly affect the fishery which has a medium value within the Array Area as evidenced by landing statistics, together with concern of loss of ability to target a growing small haddock fishery; therefore, the magnitude is considered to be medium adverse.

13.7.14. **UK pelagic otter trawl and purse seine:** consultation with the pelagic fishing industry has highlighted the importance of the Array Area to pelagic fisheries, specifically targeting herring as the species migrates to spawning grounds. Landing statistics indicate a recent annual average value landed from ICES rectangle 43E9 of £2.6 million herring (based on 2021 and 2022 landings; compared to an annual average of £1.5 million from 2016-2020, not including 2019 when no landings of herring were made from 43E9).

13.7.15. VMS data from the MMO shows pelagic trawl activity within ICES rectangle 43E9 occurring in 2016 and 2017 in areas surrounding the Array Area, but with limited activity inside the Array Area (see Volume 3, Appendix 13.1 (Commercial Fisheries Technical Report) Figures 7.2 and 7.3). VMS data for SPFA member vessels from 2013-2021 shows fishing activity along the southern edge of the Array Area boundary, and also some activity within the centre of the Array Area (see Volume 3, Appendix 13.1 (Commercial Fisheries Technical Report) Figures 7.4 and 7.5). The SPFA VMS data has been analysed for fishing operations alone and fishing and transiting combined. Higher activity by pelagic trawls is noted within the Array Area for the fishing and transiting combined analysis. Further evidence has been provided by the commercial fishing industry, including plotter data which identifies locations where shoals of herring have been caught and pelagic vessel transit routes. This data is considered important evidence to inform the impact assessment, however, is confidential in nature given that it is pertaining to individual vessels. High concern has been raised by the pelagic sector in relation to the ability to catch herring within the vicinity of the Array Area, specifically due to the presence of herring spawning grounds which are targeted during herring spawning migrations. Pelagic trawl gear requires space and distance for the gear to be deployed into position, towed to capture the shoal of fish and subsequently hauled for pumping onboard the vessel.

13.7.16. Based on the assumption that fishing will not resume within the Array Area during the entirety of the construction phase, the UK pelagic trawl fleet would be directly impacted with the loss of the ability to fish across the Array Area. Overall, the impact during construction is predicted to be of medium-term duration, to directly affect the fishery which has a high value within the Array Area as evidenced by landing statistics, pelagic industry VMS data and fishing industry plotter data (Volume 3, Appendix 13.1 (Commercial Fisheries Technical Report)); therefore, the magnitude is considered to be high adverse.

13.7.17. **Non-UK pelagic otter trawl and purse seine:** Norwegian VMS data indicates activity by pelagic trawl vessels across the southern section of the Array Area (see Volume 3, Appendix 13.1 (Commercial Fisheries Technical Report) Figure 7.21). Landing statistics for EU vessels indicate landings of herring from ICES rectangle 43E9 by Denmark, Netherlands, France and Germany (see Volume 3, Appendix 13.1 (Commercial Fisheries Technical Report) Figure 6.20). Denmark had the highest level of catch, with an annual average of 12,400 tonnes of herring from ICES rectangle 43E9. Based on the assumption that fishing will not resume within the Array Area during the entirety of the construction phase, the non-UK pelagic trawl fleets would be directly impacted with the loss of the ability to fish across the Array Area. Noting that the Array Area is outside 12 nm boundary, within the UK EEZ where these fishing nations have rights to fish and herring quota for the North Sea. Overall, the impact during construction is predicted to be of medium-term duration, to directly affect the fishery which has a high value

within the Array Area as evidenced by landing statistics and VMS data; therefore, the magnitude is considered to be high adverse.

13.7.18. **UK scallop dredge:** consultation with the fishing industry and fishing vessel plotter data has identified a king scallop bed targeted by dredgers within the central area of the Array Area. Landing statistics indicate a recent annual average value landed from ICES rectangle 43E9 of £30,000 by the UK dredge fleet (based on 2021 and 2022 landings; compared to an annual average of £148,000 from 2011-2022 from 43E9). Other ICES rectangles within the regional study area are more important to the fishery with recent annual average landings of £3.5 million (based on 2021 and 2022 landings; compared to an annual average of £5.5 million from 2011-2022 from the regional study area). This is corroborated by VMS data which shows higher value landed by scallop dredgers from the inshore ICES rectangles (42E8, 43E8 and 44E8). The VMS data for ICES rectangle 43E9, which overlaps the Array Area, shows the highest value is landed west, south and east of the Array Area; activity is recorded within the Array Area for scallop dredge in the years 2016, 2017 and 2018 in the central area. Based on the assumption that fishing will not resume within the Array Area during the entirety of the construction phase, the UK dredge fleet would be directly impacted with the loss of the ability to fish across the Array Area and within establish scallop grounds within the Array Area. Overall, the impact during construction is predicted to be of medium-term duration, to directly affect the fishery which has a medium value within the Array Area as evidenced by landing statistics, VMS data and fishing industry plotter data; therefore, the magnitude is considered to be medium adverse.

13.7.19. **UK potting:** landing statistics indicate that UK vessels deploying pots have targeted brown crab in ICES rectangle 43E9 in the years 2018 and 2020-2022, with recent annual average of £15,000 from 43E9 (based on 2021 and 2022 landings; compared to an annual average of £9,000 from 2017 to 2022). The regional study area is more important to the potting fleet, with recent annual average of £12.7 million from the regional study area (based on 2021 and 2022 landings; compared to an annual average of £10 million from 2011 to 2022). Consultation with the industry has not raised potting activity within the Array Area as a concern. It is noted that VMS data is not representative of the potting fleet, given that VMS data is only published for vessels 15m and over. Landing statistics is considered with high confidence given that it includes all vessel lengths and declaration of sales are required through the Registration of Buyers and Sellers Legislation. Overall, the impact during construction is predicted to be of medium-term duration, to directly affect the fishery which has a low value within the Array Area as evidenced by landing statistics; therefore, the magnitude is considered to be low adverse.

13.7.20. **UK gear with line and hooks:** landing statistics indicate negligible landings by vessels deploying gear with hooks (including handline and longline) within ICES rectangle 43E9. Overall, the impact during construction is predicted to be of medium-term duration, to directly affect the fishery which has a negligible value within the Array Area as evidenced by landing statistics; therefore, the magnitude is considered to be negligible.

SENSITIVITY OF RECEPTOR

13.7.21. The UK demersal otter trawl, demersal seine, pelagic trawl, purse seine, dredge, potting and line fishing fleets specifically target the local study area from the local ports of Peterhead and Fraserburgh (notably 90% of the landed value from the local study area is landed into these ports). While these fishing fleets have access to alternative fishing grounds outside the local study area, they are expected to have a higher dependence on local grounds due to fuel cost, operating distances and weather constraints. The demersal otter trawl, demersal seine, dredge, potting and line fishing fleets are considered to have moderate levels of alternative fishing grounds. Given the nature of the impact of loss of access due to floating foundations within the Array Area, these fishing fleets are deemed to be of high vulnerability to this impact

and with low recoverability due to the restricted access throughout the lifetime of the project. The sensitivity of these receptors is therefore, considered to be high.

13.7.22. The non-UK pelagic mobile fleet actively targets a wide range of grounds on a seasonal basis and is not specifically focused across this portion of the North Sea. Herring landings are made throughout the North Sea, including across grounds closer to the non-UK vessel countries (including Denmark, Germany and the Netherlands, as evidenced Figure 6.21 in Volume 3, Appendix 13.1 (Commercial Fisheries Technical Report)). The non-UK pelagic fleets are considered to have an extensive operational range, with the local study area located far from non-UK vessels' home ports. The sensitivity of these receptors is therefore, considered to be low.

SIGNIFICANCE OF EFFECT

13.7.23. UK demersal otter trawl: the magnitude of the impact is deemed to be high adverse and the sensitivity of the receptor is high. The effect will therefore be of major adverse significance, which is significant in EIA terms.

13.7.24. UK demersal seine: the magnitude of the impact is deemed to be medium adverse and the sensitivity of the receptor is high. The effect will therefore be of moderate adverse significance, which is significant in EIA terms.

13.7.25. UK pelagic otter trawl and purse seine: the magnitude of the impact is deemed to be high adverse and the sensitivity of the receptor is high. The effect will therefore be of major adverse significance, which is significant in EIA terms.

13.7.26. Non-UK pelagic otter trawl and purse seine: the magnitude of the impact is deemed to be high adverse and the sensitivity of the receptor is low. The effect will therefore be of minor adverse significance, which is not significant in EIA terms.

13.7.27. UK scallop dredge: the magnitude of the impact is deemed to be medium adverse and the sensitivity of the receptor is high. The effect will therefore be of moderate adverse significance, which is significant in EIA terms.

13.7.28. UK potting: the magnitude of the impact is deemed to be low adverse and the sensitivity of the receptor is high. The effect will therefore be of minor adverse significance, which is not significant in EIA terms.

13.7.29. UK gear with line and hooks: the magnitude of the impact is deemed to be negligible and the sensitivity of the receptor is high. The effect will therefore be of negligible significance, which is not significant in EIA terms.

Table 13-9 Significance of reduction in access to, or exclusion from established fishing grounds within the Array Area

Receptor/Location	Magnitude	Sensitivity	Significance
UK demersal otter trawl	High	High	Major
UK demersal seine	Medium	High	Moderate
UK pelagic otter trawl and purse seine	High	High	Major
Non-UK pelagic otter trawl and purse seine	High	Low	Minor
UK scallop dredge	Medium	High	Moderate
UK potting	Low	High	Minor
UK gear with hooks	Negligible	High	Negligible

SECONDARY MITIGATION AND RESIDUAL EFFECT

13.7.30. Commitments in relation to commercial fisheries are outlined in Section 13.6. In addition to this, secondary mitigation is described in this section.

13.7.31. The Developer is committed to aligning with FLOWW guidance documents (2014 and 2015; and future updates to this guidance), including future updates related to floating OWFs.

13.7.32. The Developer is committed to implementing the FMMS. An outline FMMS is provided in Volume 4, Appendix 4 (Outline Fisheries Management and Mitigation Strategy), which will be further developed in collaboration with and through engagement with the commercial fishing industry prior to construction commencing.

13.7.33. As defined in the Outline FMMS, the Developer is committed to delivering an adaptation fund during the construction phase to support commercial fisheries receptors where a major or moderate significant effect has been identified in relation to the Array Area. The adaptation fund will support these commercial fishing businesses affected by the Array Area during construction with the process, including evidence base, following FLOWW guidance as defined in the Outline FMMS. The identification of the relevant affected fleets, as defined in Table 13-9, and commitment to the adaptation fund is considered secondary mitigation.

13.7.34. The Developer is proposing a package of commitments and mitigation being developed and delivered through the FMMS including:

- Commitment to monitoring of fisheries activity pre, during and post-construction using existing data sources including landing statistics, VMS, AIS, OFLO observations and industry consultation. The monitoring is intended to validate the impact assessment assumptions (e.g., that fishing will not resume within the Array Area) and provide opportunity to inform the FMMS should any updates to the FMMS be necessary; and
- Commitment to funding research and/or initiatives relevant to the fisheries affected.

13.7.35. In addition, the Developer commits to surveys across areas of cable protection deployed across inter-array cables, interconnector cables and offshore export cables to establish that fishing can resume safely post construction, this may include cable protection surveys following consultation with commercial fishing industry. This will be secured within the FMMS.

13.7.36. The Outline FMMS provides details on proposed fisheries activity monitoring that will be undertaken utilising publicly available data sources, as well as scouting surveys, offshore FLO records and consultation with the fishing industry, to understand the effects on fishing activity in response to the construction of the Array Area.

13.7.37. Notwithstanding the above secondary mitigation, the loss of access to the Array Area during construction is unavoidable due to the inclusion of catenary mooring lines and anchor system of the floating WTGs. The Developer has therefore committed to an Obstacle Free Zone within the Array Area for the purpose of avoiding the grounds identified as extremely important to demersal otter trawlers targeting haddock and pelagic trawlers targeting herring, if required following further consultation with the fishing industry. The Obstacle Free Zone is proposed to occupy approximately 13 km^2, 6.5 % of the total Array Area and the indicative area is depicted in Figure 13.8. The proposed Obstacle Free Zone will contain no operational infrastructure from the seabed surface upwards: floating foundations, foundation moorings, foundation anchors, WTGs and OEP(s).

13.7.38. In order to identify the best location for the Obstacle Free Zone, the Developer has agreed further data collection to take place in 2025 on board of fishing vessels in the area. This work has already been agreed with individual fishing companies. The final location and boundaries of the Obstacle Free Zone will be finalised post-consent through the FMMS approval process.

13.7.39. Based on the commitments provided in the FMMS, together with the Obstacle Free Zone and adaptation fund during the construction phase, the residual effect of this impact during construction is reduced to minor adverse significance for all receptors, as presented in Table 13-10.

13.7.40. While the Obstacle Free Zone could benefit other marine receptors, all offshore assessments (other than this Chapter) are based on surface piercing infrastructure throughout the array area, which represents an appropriate worst case scenario in the event that an alternative to the proposed Obstacle Free Zone that may be agreed with key fisheries stakeholders post-consent.

Legend:

- Array Area
- Offshore Export Cable Corridor
- ICES statistical rectangles
- Indicative Obstacle Free Zone

Project: Muir Mhòr	Report: Commercial Fisheries Chapter

Indicative
Obstacle Free Zone

Figure: 13.8	Drawing No: GoBe-0001		
Revision:	Date:	Drawn:	Checked:
01	14/11/24	FN	BPHB

Map scale 1:100,000 @ A3

0 1 2 km

Co-ordinate system: ETRS 1989 UTM Zone 30N **EPSG:** 25830

MUIR MHÒR
OFFSHORE WIND FARM
A joint venture between Fred. Olsen Seawind & Vattenfall

Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

Table 13-10 Secondary mitigation and residual effect of reduction in access to, or exclusion from established fishing grounds within the Array Area

Receptor/Location	Significance	Secondary Mitigation	Residual Effect
UK demersal otter trawl	Major	FMMS, Obstacle Free Zone and adaptation fund	Minor
UK demersal seine	Moderate		Minor
UK pelagic otter trawl and purse seine	Major		Minor
Non-UK pelagic otter trawl and purse seine	Minor	FMMS	Minor
UK scallop dredge	Moderate	FMMS, Obstacle Free Zone and adaptation fund	Minor
UK potting	Minor	FMMS	Minor
UK gear with hooks	Negligible	FMMS	Negligible

IMPACT 2 REDUCTION IN ACCESS TO, OR EXCLUSION FROM ESTABLISHED FISHING GROUNDS WITHIN THE OFFSHORE ECC

13.7.41. Fishing activity will be locally and temporarily excluded at the location of construction of the offshore ECC 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) (International Maritime Organization (IMO), 1974).

13.7.42. The construction scenario assumes a construction period of approximately four years in a single phase. In terms of the area impacted by construction activities, in total 810,000 m^2 of seabed will be disturbed during construction. In addition, an advisory safe passing distance of 500 m radius around cable installation vessels active along the offshore ECC is recommended (i.e., a roaming 0.79km^2 area along the 270 km offshore ECC). In addition, up to 50% of the length of the ECC may require cable protection including: rock placement, concrete mattresses, grout/rock bags, frond mattresses. The worst case scenario for total export cable protection footprint is 50% of 270 km length of cable to be protected at a width of 3 m, equating to 0.405 km^2 of cable protection distributed throughout the offshore ECC.

MAGNITUDE OF IMPACT

13.7.43. The Offshore ECC overlaps with ICES rectangle 44E8 from 0 to 14 nm at which point it enters ICES rectangle 43E8 and eastwards into 43E9 where it meets the Array Area. The region from 0 to 12 nm is heavily fished by a range of difference commercial fishing fleets, as discussed below.

13.7.44. **UK demersal otter trawl and demersal seine:** VMS data shows consistently targeted grounds within 44E8, particularly inshore, out to 6 nm. The NERIFG mapping corroborates this, with identification of highly targeted haddock and mixed demersal fish grounds inshore, from 0 to 6 nm and beyond 12 nm, within 44E8 and 43E8 and overlapping the offshore ECC. Landing statistics indicate a combined value of £2.8 million per annum by demersal otter trawl and demersal seine from 44E8 and 43E8 (based on 5-years from 2018-2022). As described in the wort case design scenario (Table 13-8), up to 50% of the ECC will require cable protection (including potential options of rock placement, concrete mattresses, grout/rock bags and frond mattresses, or a combination of all these measures), across an area of up to 0.405 km^2 spread across locations throughout the offshore ECC as required. Based on the value and extent of overlap within ICES rectangle 44E8 and 43E8, the requirement to avoid areas of construction and the expectation that scallop dredge gear will not resume across

areas of cable protection, the magnitude of impact for the demersal otter trawl and seine fishery is assessed as medium.

13.7.45. **UK and non-UK pelagic otter trawl and purse seine:** VMS data from the MMO indicates minimal activity by pelagic otter trawlers within 44E8. The VMS data provided by SPFA indicates some activity within 0 to 3 nm, particularly adjacent to Peterhead with some overlap with the offshore ECC. Landing statistics indicate a value of £163,000 landings by pelagic vessels primarily targeting herring (based on five-year average from 2018-2022) from ICES rectangle 44E8. VMS data provided by SPFA demonstrates that areas north of the offshore ECC have higher levels of pelagic fishing activity. Herring are a highly mobile species and opportunity to catch them is not likely to be impeded by construction activities of the offshore ECC. Fishing vessels are expected to be able to avoid areas of construction with prior notification. Overall, the magnitude of impact for the pelagic fishery is assessed as low.

13.7.46. **UK scallop dredge:** VMS data shows consistently targeted dredge grounds within 44E8, particularly inshore, from 3 nm out to 12 nm. The NERIFG mapping corroborates this, with identification of highly targeted scallop grounds inshore from 3 to 6 nm and moderately targeted grounds from 6 to 12 nm, within 44E8 and overlapping the offshore ECC. On average, £845,000 value is landed by the UK dredge fleet from ICES rectangle 44E8 (based on long-term average of 2013-2022), noting high effort to the north of the offshore ECC, as well as within the offshore ECC. Overall, based on VMS data, approximately 7% of the dredge value is landed from 44E8 is taken from areas overlapping the offshore ECC. The overlap of the offshore ECC occurs within the central to south portion of the scallop grounds targeted, thereby construction activities could potentially impact duration or length of fishing vessel tow in north-to-south or south-to-north directions. The VMS and NERIFG mapping indicate low-moderate overlap with scallop grounds in the portion of the offshore ECC that overlaps ICES rectangles 43E8 and 43E9. Scallop dredgers will not be able to access areas of the offshore ECC that are under construction, and areas where cable protection prohibits practicable deploying of dredge gear. Scallop dredge gear penetrates the sediment by up to 20-30 cm and therefore areas of cable protection are likely to be avoided by scallop dredge vessels. As described in the wort case design scenario (Table 13-8), up to 50% of the offshore ECC will require cable protection (including potential options of rock placement, concrete mattresses, grout/rock bags and frond mattresses, or a combination of all these measures), across an area of up to 135 km^2 spread across locations throughout the offshore ECC as required. In addition, it is noted that Marine Guidance Notice (MGN) 661 advises that mobile fishing vessels with penetrative gear avoid submarine cables, and while cables are typically buried or protected to allow trawling, the active penetration of dredge gear into the sediment makes MGN 661 more pertinent to this gear type, especially in areas where target burial depth is not achieved. Based on the value and extent of overlap within ICES rectangle 44E8, the requirement to avoid areas of construction and the expectation that scallop dredge gear will not resume across areas of cable protection, the magnitude of impact for the scallop dredge fishery is assessed as medium adverse.

13.7.47. **UK potting:** inshore mapping of value of catch by under 12m vessels illustrate moderate-high value across the offshore ECC, with most potting activity occurring within 6 nm from shore, and concentrated high effort close inshore (from 0-3 nm). Landing statistics indicate a value of £1.7 million (based on five-year average from 2018-2022) from ICES rectangle 44E8, with key target species of brown crab, lobster and velvet crab. Fishing vessel businesses that deploy potting gear will be required to relocate gear from areas under construction. This impact will be intermittent and temporary in nature. Overall, based on the value of the fishery, the activity across the offshore ECC and the requirement to relocate gear during construction activities, the magnitude of impact for the potting fishery is assessed as medium adverse.

13.7.48. **UK gear with line and hooks**: this fishery includes handline, longline and jigging. The gear is typically deployed by potting vessels on a seasonal basis from July to September to target

migrating mackerel. Landing statistics indicate a value of £217,000 mackerel landings by vessels using line and hook gear (based on five-year average from 2018-2022) from ICES rectangle 44E8. Gear is unlikely to make contact with the seabed and is not left unattended in the same way as potting gear. Mackerel are a highly mobile species and opportunity to catch them is not likely to be impeded by construction activities of the offshore ECC. Fishing vessels are expected to be able to avoid areas of construction with prior notification. Overall, the magnitude of impact for the line and hook fishery is assessed as low adverse.

SENSITIVITY OF RECEPTOR

13.7.49. For bottom contact mobile and static gears, including demersal otter trawl, demersal seine, scallop dredge and potting, based on the level of cable protection these gears are considered more sensitive to loss of access to fishing grounds overlapping the offshore ECC. The demersal otter trawl, demersal seine, dredge and potting fleets are considered to have moderate levels of alternative fishing grounds; are deemed to be of medium vulnerability and medium recoverability. The sensitivity of these receptors is therefore, considered to be medium.

13.7.50. The pelagic mobile fleet actively targets a wide range of grounds on a seasonal basis and is not specifically focused across the offshore ECC. All pelagic gear fleets are considered to have an extensive operational range, be highly adaptive and resilient to change. The sensitivity of these receptors is therefore, considered to be low.

13.7.51. The hook and line fishery is highly seasonal and targets a highly mobile species. Gear is likely to be operational across areas of cable protection and the opportunity to catch mackerel is not likely to be impeded by construction activities of the offshore ECC. The sensitivity of this receptor is therefore, considered to be low.

SIGNIFICANCE OF EFFECT

13.7.52. UK demersal otter trawl: the magnitude of the impact is deemed to be medium adverse and the sensitivity of the receptor is medium. The effect will therefore be of moderate adverse significance, which is significant in EIA terms.

13.7.53. UK demersal seine: the magnitude of the impact is deemed to be medium adverse and the sensitivity of the receptor is medium. The effect will therefore be of moderate adverse significance, which is significant in EIA terms.

13.7.54. UK pelagic otter trawl and purse seine: the magnitude of the impact is deemed to be low adverse and the sensitivity of the receptor is low. The effect will therefore be of minor adverse significance, which is not significant in EIA terms.

13.7.55. Non-UK pelagic otter trawl and purse seine: the magnitude of the impact is deemed to be low adverse and the sensitivity of the receptor is low. The effect will therefore be of minor adverse significance, which is not significant in EIA terms.

13.7.56. UK scallop dredge: the magnitude of the impact is deemed to be medium adverse and the sensitivity of the receptor is medium. The effect will therefore be of moderate adverse significance, which is significant in EIA terms.

13.7.57. UK potting: the magnitude of the impact is deemed to be medium adverse and the sensitivity of the receptor is medium. The effect will therefore be of moderate adverse significance, which is significant in EIA terms.

13.7.58. UK gear with line and hooks: the magnitude of the impact is deemed to be low adverse and the sensitivity of the receptor is low. The effect will therefore be of minor adverse significance, which is not significant in EIA terms.

Table 13-11 Significance of reduction in access to, or exclusion from established fishing grounds within the ECC

Receptor/Location	Magnitude	Sensitivity	Significance
UK demersal otter trawl	Medium	Medium	Moderate
UK demersal seine	Medium	Medium	Moderate
UK pelagic otter trawl and purse seine	Low	Low	Minor
Non-UK pelagic otter trawl and purse seine	Low	Low	Minor
UK scallop dredge	Medium	Medium	Moderate
UK potting	Medium	Medium	Moderate
UK gear with hooks	Low	Low	Minor

SECONDARY MITIGATION AND RESIDUAL EFFECT

13.7.59. Commitments in relation to commercial fisheries are outlined in Section 13.6, including a FMMS, with an Outline FMMS provided in Volume 4, Appendix 4 (Outline Fisheries Management and Mitigation Strategy). As defined in the Outline FMMS, the Developer is committed to delivering an adaptation fund to commercial fisheries receptors where a moderate significant effect has been identified during construction of the offshore ECC. In relation to potting fisheries this adaptation fund will include a disruption agreement based on the requirement to relocate fishing gear from locations undergoing construction works.

13.7.60. The Outline FMMS provides details on proposed fisheries activity monitoring that will be undertaken utilising publicly available data sources, as well as scouting surveys, offshore FLO records and consultation with the fishing industry, to understand the effects on fishing activity in response to the construction of the Proposed Development.

13.7.61. Based on the commitments provided in the FMMS, together with an adaptation fund, the residual effect is reduced to minor adverse significance for all receptors, as presented in Table 13-12.

Table 13-12 Significance of reduction in access to, or exclusion from established fishing grounds within the offshore ECC

Receptor/Location	Significance	Secondary Mitigation	Residual Effect
UK demersal otter trawl	Moderate	FMMS and adaptation fund	Minor
UK demersal seine	Moderate		Minor
UK pelagic otter trawl and purse seine	Minor	Low	Minor
Non-UK pelagic otter trawl and purse seine	Minor	Low	Minor
UK scallop dredge	Moderate	FMMS and adaptation fund	Minor
UK potting	Moderate		Minor
UK gear with hooks	Minor	Low	Minor

IMPACT 3 DISPLACEMENT LEADING TO GEAR CONFLICT AND INCREASED FISHING PRESSURE ON ADJACENT GROUNDS

13.7.62. Loss of access or exclusion from fishing grounds due to the Proposed Development may lead to increases in fishing effort in other areas that may already be exploited thereby leading to increased pressure and gear conflict.

13.7.63. This assessment of displacement has been undertaken with due regard to Xodus (2022) guidelines in defining the magnitude of impact to each receptor group and sensitivity of each commercial fishing fleet. The displacement considers both primary and secondary displacement, defined as follows (Xodus, 2022):

- Primary displacement refers to the first instance of displacement where fishing effort is relocated to another area as a result of a change in the spatial environment. This corresponds to displacement that is a direct result of other licensed marine activities and associated infrastructure.
- Secondary displacement is an indirect effect of the other licensed marine activity and associated infrastructure. This occurs when the fishing effort that is relocated through primary displacement also displaces other fishing effort.

13.7.64. The guidance provides details on baseline data sources, highlighting that no single source of data can be used to comprehensively describe commercial fishing activity, due to the inherent limitations of each data source. Data sources are detailed in Section 13.5, together with associated limitations and uncertainties. The guidance specifically recommends the following steps (Xodus, 2022):

- Clear understanding of the commercial fishing 'receptors' for which impacts will be assessed, the fishing methods which are operated in the study area, including the areas where fishing activity may be relocated;
- Identification of the likely maximum distance of displacement by the receptors, and the potential spatial extent of displacement effects for the fishing vessels which are already operational in the area which vessels are displaced to;
- Identification of potential impacts on displaced commercial fisheries from the area that vessels are initially displaced from;
- Identification of potential impacts on any fishing vessel operators / owners which are already active in the area in which vessels are displaced to and the potential for competition for space;
- Establishing the sensitivity of each commercial fisheries receptor to displacement, with reference to the specifications;
- If possible, a quantitative assessment of magnitude (e.g. taking account of spatial extent, duration, fishing effort, number of vessels); and
- Consideration of primary and secondary displacement where applicable.

MAGNITUDE OF IMPACT

13.7.65. Conflict over diminished grounds may occur if displaced vessels explore grounds traditionally fished by other gear types; and/or displaced vessels relocate to actively fish grounds already targeted by the same gear. For example, this could include displaced demersal otter trawlers exploring areas fished by potters and thereby causing gear conflict or gear entanglement between potting lines and trawl gear and/or displaced demersal otter trawlers focusing effort in areas already fished by demersal otter trawlers and therefore increasing competition in that

area. The impact is predicted to be of regional spatial extent, medium-term duration and continuous.

13.7.66. **UK demersal otter trawl, demersal seine and dredge:** These vessels have an operational range throughout the commercial fisheries regional study area and further into the North Sea and, in the case of scallop dredge throughout waters around the UK. These fishing fleets target a range of alternative grounds, including the local study area, which due to its proximity to key fishing ports is fished with higher intensity and considered an important fishing location. Given the higher dependence of local vessels on this local study area (based on high proportion of landings into local ports), these vessels could be expected to remain within the regional study area, so proportionally experience a higher degree of displacement. The value of the fisheries has been described within the reduction of access impacts. It is considered that a proportion of this value will be redirected to alternative fishing grounds that have been routinely fished by the displaced operators, with the remainder focused on alternative fishing grounds not routinely fished. The former causes increase pressure on alternative grounds and the latter may cause increase conflict between fishers. Overall, the magnitude of impact for the demersal otter trawl, demersal seine and dredge fleets is assessed as medium.

13.7.67. **UK and non-UK pelagic otter trawl and purse seine:** pelagic fleets operate throughout the entirety of the North Sea, west of Scotland and Celtic Sea across a range of established fishing grounds. The fishery is highly seasonal with vessels seeking shoals of fish across a wide area. The area overlapping the Proposed Development has been recognised by industry as a herring spawning ground and therefore the fishery is associated with the type of seabed sought by herring as demersal egg spawners. Notwithstanding this, there are a limited number of pelagic vessels (e.g., approximately 21 in the Scottish fleet) that operate across a wide area targeting highly mobile species and catching to an allocated quota level. Displacement is not expected to affect how pelagic vessels routinely operate. Overall, the magnitude of impact for the pelagic fleets is assessed as low.

13.7.68. **UK potting:** Conflict over diminished grounds may occur if displaced vessels operating mobile gear (e.g. dredge or demersal trawl) explore grounds traditionally fished by potters; and/or displaced potting gear is relocated into other actively fished potting grounds. Displacement of mobile gear may therefore increase the risk of interaction with potting gear.

13.7.69. When considering the impact of potters being displaced into grounds already targeted by potters two scenarios are feasible:

- Alternative fishing grounds are available to relocate gear, in which case gear conflict and displacement effects will be low.
- Alternative fishing grounds are not available as adjacent areas are already being fished by potters, 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.

13.7.70. Taking these aspects into consideration, the magnitude of the displacement impact is assessed to be medium for potting vessels.

13.7.71. **UK gear with hooks:** This fishery is highly seasonal and operated within inshore grounds. Hot spots of activity are noted immediately south of the ECC from 0 to 3 m. Displacement is expected to be short term across the portion of ECC targeted; with effort likely to move into these higher importance areas located outside the ECC. Overall, the magnitude of impact for the line and hook fishery is assessed as low.

SENSITIVITY OF RECEPTOR

13.7.72. All UK mobile commercial fisheries fleets (including demersal trawl, demersal seine, pelagic trawl and dredge fisheries) operating within and around the Proposed Development are considered to have moderate availability of alternative fishing grounds, and an operational range that is not limited to the Proposed Development or commercial fisheries local study area. The proximity of the Proposed Development to key Scottish fishing ports of Peterhead and Fraserburgh is noted. The fishing grounds from the coast out to 43 nm and overlapping the Array Area, are considered by the local fleets to be 'inshore', in comparison to fishing grounds across the wider North Sea. For local fleets, including but not limited to vessels based at Peterhead and Fraserburgh, these 'inshore' grounds are particularly important in periods of inclement weather and have been identified as extremely important fishing areas in comparison to alternative fishing grounds. All mobile fleets are deemed to be of medium vulnerability, with medium recoverability. The sensitivity of all UK mobile fleets is therefore, considered to be medium.

13.7.73. The UK potting and hook and line fleet operates across large areas inshore from 0 to 12 nm. This form of static fishing gear is considered to have a high vulnerability to gear conflict interactions since it is left unattended on the seabed. There is potential for any displacement from mobile vessels to lead to exploration of other fishing grounds outside the Proposed Development, which includes areas currently targeted by potters. While grounds targeted by potters may not be suitable for other mobile gears due to substrate, the potential for gear conflict is well recognised and becomes a more prevalent concern with increasing marine spatial squeeze (Plymouth Marine Laboratory, 2024). In this context, potting is particularly sensitive to secondary displacement. The UK potting fleet are, therefore, deemed to be of high vulnerability, with medium recoverability. The sensitivity of the UK potting and hook and line fleet is therefore, considered to be medium.

13.7.74. For non-UK pelagic trawl and purse seine fleets, the high level of alternative fishing grounds and lower reliance on the 'inshore' grounds closer to UK home ports results in a comparatively lower sensitivity than UK fleets. All non-UK pelagic fleets are deemed to be of low vulnerability, with medium recoverability; the sensitivity is therefore, considered to be low.

SIGNIFICANCE OF EFFECT

13.7.75. UK demersal otter trawl: the magnitude of the impact is deemed to be medium adverse and the sensitivity of the receptor is medium. The effect will therefore be of moderate adverse significance, which is significant in EIA terms.

13.7.76. UK demersal seine: the magnitude of the impact is deemed to be low adverse and the sensitivity of the receptor is medium. The effect will therefore be of minor adverse significance, which is not significant in EIA terms.

13.7.77. UK pelagic otter trawl and purse seine: the magnitude of the impact is deemed to be low adverse and the sensitivity of the receptor is medium. The effect will therefore be of minor adverse significance, which is not significant in EIA terms.

13.7.78. Non-UK pelagic otter trawl and purse seine: the magnitude of the impact is deemed to be low adverse and the sensitivity of the receptor is low. The effect will therefore be of minor adverse significance, which is not significant in EIA terms.

13.7.79. UK scallop dredge: the magnitude of the impact is deemed to be medium adverse and the sensitivity of the receptor is medium. The effect will therefore be of moderate adverse significance, which is significant in EIA terms.

13.7.80. UK potting: the magnitude of the impact is deemed to be medium adverse and the sensitivity of the receptor is medium. The effect will therefore be of moderate adverse significance, which is significant in EIA terms.

UK gear with line and hooks: the magnitude of the impact is deemed to be low adverse and the sensitivity of the receptor is medium. The effect will therefore be of minor adverse significance, which is not significant in EIA terms.

Table 13-13 Significance of displacement leading to gear conflict and increased fishing pressure on adjacent grounds

Receptor/Location	Magnitude	Sensitivity	Significance
UK demersal otter trawl	Medium	Medium	Moderate
UK demersal seine	Medium	Medium	Moderate
UK pelagic otter trawl and purse seine	Low	Medium	Minor
Non-UK pelagic otter trawl and purse seine	Low	Low	Minor
UK scallop dredge	Medium	Medium	Moderate
UK potting	Medium	Medium	Moderate
UK gear with hooks	Low	Medium	Minor

SECONDARY MITIGATION AND RESIDUAL EFFECT

13.7.81. Commitments in relation to commercial fisheries are outlined in Section 13.6, including a FMMS, with an Outline FMMS provided in Volume 4, Appendix 4 (Outline Fisheries Management and Mitigation Strategy). As defined in the Outline FMMS, and described for the secondary mitigation related to reduced access, the Developer is committed to an Obstacle Free Zone within the Array Area (Figure 13.8), an adaptation fund throughout the construction phase and monitoring of fisheries activity. As defined in the Outline FMMS, the Developer is committed to early communication of construction related activities to allow fishers to plan their activities appropriately. Based on these commitments, the effect of reduced access is mitigated as far as possible, thereby reducing the potential for displacement. The residual effect is therefore reduced to minor adverse significance for all receptors, as presented in Table 13-10.

Table 13-14 Secondary mitigation and residual effect of displacement leading to gear conflict and increased fishing pressure on adjacent grounds

Receptor/Location	Significance	Secondary Mitigation	Residual Effect
UK demersal otter trawl	Moderate	FMMS, Obstacle Free Zone and adaptation fund	Minor
UK demersal seine	Moderate		Minor
UK pelagic otter trawl and purse seine	Minor	FMMS	Minor
Non-UK pelagic otter trawl and purse seine	Minor		Minor
UK scallop dredge	Moderate	FMMS, Obstacle Free Zone and adaptation fund	Minor
UK potting	Moderate		Minor
UK gear with hooks	Minor	FMMS	Minor

IMPACT 4 DISTURBANCE OF COMMERCIALLY IMPORTANT FISH AND SHELLFISH RESOURCES LEADING TO DISPLACEMENT OR DISRUPTION OF FISHING ACTIVITY

13.7.82. Noise and seabed disturbances during the construction phase may decrease or displace commercially important fish and shellfish populations from the area. This section assesses the subsequent effect 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.

MAGNITUDE OF IMPACT

13.7.83. Detailed assessments of the following potential construction impacts have been undertaken in Volume 2, Chapter 10 (Fish and Shellfish Ecology):

- Increases in suspended sediment concentrations (SSCs) and deposition of disturbed sediments to the seabed;
- Temporary habitat disturbance;
- Direct and indirect seabed disturbance leading to release of sediment contaminants;
- Direct damage (e.g. crushing) and disturbance;
- Mortality, and mortal injury arising from underwater noise (UWN);
- Recoverable injury arising from UWN;
- Temporary Threshold Shift (TTS) arising from UWN;
- Behavioural impacts arising from UWN;
- Noise and vibration arising from unexploded ordnance (UXO) clearance; and
- Noise and vibration arising from other noise sources during construction.

13.7.84. 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). This is because the overall effect on the fish and/or shellfish species relates directly to the availability and amount of exploitable resource. For instance, where an effect of minor adverse significance is assessed for a species, a low magnitude is assessed for commercial fishing, and so on.

13.7.85. Details of the fish and shellfish ecology assessment, together with the supporting evidence and justification are provided in Volume 2, Chapter 10 (Fish and Shellfish Ecology). The fish and shellfish ecology assessment found all construction impacts to be of negligible to minor adverse significance for all fish and shellfish receptors, with exception of herring spawning.

13.7.86. The magnitude of impact is predicted to be of regional spatial extent, of relevance to international fishing fleets, and of medium-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 for all species with the exception of herring which is considered medium adverse. In relation to commercial fisheries receptors, all fleets are deemed to have a low magnitude with the exception of pelagic trawl and purse seine fleets that target herring and are therefore considered to have a medium adverse magnitude.

SENSITIVITY OF RECEPTOR

13.7.87. Exposure to the impact is likely and commercial fleets targeting key species may be affected, including haddock, whiting, herring, mackerel, scallop, brown crab, lobster and mixed demersal finfish.

13.7.88. Due to the importance of the local study area to vessels operating from local ports, together with the uncertainty of effects of floating foundations on fish and shellfish resources, the sensitivity of the receptor for all fisheries is therefore, considered to be medium.

SIGNIFICANCE OF EFFECT

13.7.89. UK demersal otter trawl: the magnitude of the impact is deemed to be low adverse and the sensitivity of the receptor is medium. The effect will therefore be of minor adverse significance, which is not significant in EIA terms.

13.7.90. UK demersal seine: the magnitude of the impact is deemed to be low adverse and the sensitivity of the receptor is medium. The effect will therefore be of minor adverse significance, which is not significant in EIA terms.

13.7.91. UK pelagic otter trawl and purse seine: the magnitude of the impact is deemed to be medium adverse and the sensitivity of the receptor is medium. The effect will therefore be of minor adverse significance, which is not significant in EIA terms.

13.7.92. Non-UK pelagic otter trawl and purse seine: the magnitude of the impact is deemed to be medium adverse and the sensitivity of the receptor is medium. The effect will therefore be of minor adverse significance, which is not significant in EIA terms.

13.7.93. UK scallop dredge: the magnitude of the impact is deemed to be low adverse and the sensitivity of the receptor is medium. The effect will therefore be of minor adverse significance, which is not significant in EIA terms.

13.7.94. UK potting: the magnitude of the impact is deemed to be low adverse and the sensitivity of the receptor is medium. The effect will therefore be of minor adverse significance, which is not significant in EIA terms.

13.7.95. UK gear with line and hooks: the magnitude of the impact is deemed to be low adverse and the sensitivity of the receptor is medium. The effect will therefore be of minor adverse significance, which is not significant in EIA terms.

Table 13-15 Significance of disturbance of commercially important fish and shellfish resources leading to displacement or disruption of fishing activity

Receptor/Location	Magnitude	Sensitivity	Significance
UK demersal otter trawl	Low	Medium	Minor
UK demersal seine	Low	Medium	Minor
UK pelagic otter trawl and purse seine	Medium	Medium	Moderate
Non-UK pelagic otter trawl and purse seine	Medium	Medium	Moderate
UK scallop dredge	Low	Medium	Minor
UK potting	Low	Medium	Minor
UK gear with hooks	Low	Medium	Minor

SECONDARY MITIGATION AND RESIDUAL EFFECT

13.7.96. As defined in Volume 2, Chapter 10 (Fish and Shellfish Ecology), additional fish and shellfish ecology mitigation is considered to be necessary due to the potential for significant effects on spawning herring.

13.7.97. Mitigation options are presented within Volume 4, Appendix 10 (In Principle Fish Mitigation Plan) that shows how these significant effects during herring spawning can be reduced to levels that are not significant. The residual effect will be minor, which is not significant in EIA terms.

IMPACT 5 INCREASED VESSEL TRAFFIC ASSOCIATED WITH THE PROPOSED DEVELOPMENT WITHIN FISHING GROUNDS LEADING TO INTERFERENCE WITH FISHING ACTIVITY

13.7.98. This section assesses the likely significant effects arising from project related vessel traffic and changes to shipping patterns as a result of any potential navigational channels leading to interference with fishing activity (reduced access) during construction.

MAGNITUDE OF IMPACT

13.7.99. Vessel movements (construction vessels transiting to and from areas undergoing construction works) related to the construction of Proposed Development and all associated infrastructure will add to the existing level of shipping activity in the area, see Volume 2, Chapter 14 (Shipping and Navigation) for a full assessment of additional vessel movements.

13.7.100. Up to 1,711 return trips by construction vessels (and site preparation vessels) with up to 21 construction vessels on site at one time may occur throughout the construction phase and will include vessels which are Restricted in their Ability to Manoeuvre (RAM). Project vessels will be managed by marine coordination, including the use of traffic management procedures such as the designation of entry and exit points to and from the buoyed construction area. Project vessels will also carry AIS and be compliant with relevant Flag State regulations, including the COLREGs, and comply with the procedures set out in the VMP (which will be a condition of consent).

13.7.101. Safety zones will be applied for including up to 500m around structures where vessels are undertaking construction work and 50m around partially completed or completed surface piercing structures prior to commissioning of the wind farm. Such safety zones will protect project vessels involved in construction which may be RAM. If on-site as deemed necessary via risk assessment, guard vessels will also assist with monitoring safety zones and alerting third party traffic to their presence.

13.7.102. Details of construction activities, including the presence of safety zones and any use of advisory safe passing distances, as defined by risk assessment, will be suitably promulgated to maximise awareness of ongoing construction activities.

13.7.103. Additionally, the use of International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) G1162 (IALA, 2021) compliant lighting and marking including lights, marks, sounds, signals and other aids to navigation as required by the Northern Lighthouse Board (NLB) and the Maritime and Coastguard Agency (MCA) will further maximise awareness, both in day and night conditions including in restricted visibility. This includes the buoyed construction area which will be agreed with the NLB prior to construction and within which project vessels undertaking construction activities will most likely be located during construction activities. In addition, the Developer will endeavour to agree shelter areas for construction vessels with the fishing industry to minimise impacts on fishing activities to the extent practicable.

13.7.104. It is noted that continuous liaison with the fishing industry will be undertaken including location and duration of construction activities; further details are provided in Volume 4, Appendix 4 (Outline Fisheries Management and Mitigation Strategy).

13.7.105. All fishing fleets are considered to be able to avoid vessel movements related to construction of the Proposed Development based on prior provision of construction details (timings and locations) allowing fishing vessels to plan their activities; use of traffic management procedures including entry and exit points for Project related vessels; use of buoyed construction area and adherence to the VMP. The magnitude is therefore, considered to be low for all fisheries.

SENSITIVITY OF RECEPTOR

13.7.106. Potting gear can be vulnerable to increased construction vessel movements within supply routes to and from entry and exit points due to risk of entanglement of construction vessel propellers with marker buoys of fishing gear. It is noted that construction vessels are likely to follow established shipping routes where possible. The sensitivity of the potting fleet is therefore, considered to be medium.

13.7.107. All other fishery fleets are expected to be in a position to avoid construction areas associated with the Proposed Development. The sensitivity of pelagic trawl, demersal trawl fisheries (including otter trawl and demersal seine), the dredge fishery and line fishery are considered to be low.

SIGNIFICANCE OF EFFECT

13.7.108. UK potting: the magnitude of the impact is deemed to be low adverse and the sensitivity of the receptor is medium. The effect will therefore be of minor adverse significance, which is not significant in EIA terms.

13.7.109. All other commercial fisheries receptors: the magnitude of the impact is deemed to be low adverse and the sensitivity of the receptor is low. The effect will therefore be of minor adverse significance, which is not significant in EIA terms.

Table 13-16 Significance of increased vessel traffic associated with the Proposed Development within fishing grounds leading to interference with fishing activity

Receptor/Location	Magnitude	Sensitivity	Significance
UK demersal otter trawl	Low	Low	Minor
UK demersal seine	Low	Low	Minor
UK pelagic otter trawl and purse seine	Low	Low	Minor
Non-UK pelagic otter trawl and purse seine	Low	Low	Minor
UK scallop dredge	Low	Low	Minor
UK potting	Low	Low	Minor
UK gear with hooks	Low	Low	Minor

SECONDARY MITIGATION AND RESIDUAL EFFECT

13.7.110. No additional commercial fisheries mitigation is considered necessary because the likely effect in the absence of further mitigation (beyond the commitments outlined in Section 13.6) is not significant in EIA terms.

IMPACT 6 ADDITIONAL STEAMING TO ALTERNATIVE FISHING GROUNDS FOR VESSELS THAT WOULD OTHERWISE FISH WITHIN THE PROPOSED DEVELOPMENT

13.7.111. A detailed Navigational Risk Assessment (NRA) (Volume 3, Appendix 14.1 (Navigational Risk Assessment)) has been undertaken and is discussed in Volume 2, Chapter 14 (Shipping and Navigation), which includes full consideration of commercial fishing vessels while transiting (e.g. from a collision and allision perspective). This assessment focuses on the likely significant effects arising from longer steaming distances to alternative fishing grounds that would have otherwise been targeted within the Proposed Development.

MAGNITUDE OF IMPACT

13.7.112. Details of the construction activities will be promulgated in advance of, and during construction via the usual means (e.g. NtMs, Kingfisher bulletin) so that mariners are made aware of the ongoing works. Localised construction works will necessitate minor deviations for fishing vessels. Localised impacts are anticipated but will be limited to the immediate area of construction activity and associated construction vessels. The vessel route density data for fishing vessels indicates high levels of activity and clear transit routes in the inshore areas (0 to 12 nm).

13.7.113. The demersal otter trawl fleet has identified key fishing grounds across the Array Area, which are locally considered to be ‘inshore’ in comparison to wider north and central North Sea fishing grounds. Given adequate notification it is expected that these vessels will be in a position to avoid construction areas and the Proposed Development, but that additional steaming time may be necessary to reach alternative grounds. Overall, the magnitude of impact for the demersal otter trawl fishery is assessed as medium.

13.7.114. For all other fleets with prior notification of construction activities, it is not expected that considerable additional steaming would be required to access fishing grounds outside those normally targeted within the Proposed Development. There may be an inconvenience to plan fishing around the construction activities, but this is not expected to result in additional steaming requirements above normal operating practices. The impact is predicted to be of regional spatial extent, medium term duration, intermittent and with high reversibility. It is predicted that the impact will affect the receptor directly. Based on the justifications above, the magnitude is therefore, considered to be low for all other fisheries.

SENSITIVITY OF RECEPTOR

13.7.115. The UK potting fleet active in the local and regional study areas operate across a range of grounds to haul and re-set different fleets of traps/pots on a daily basis. Their normal operating range is expected to be inshore from the Array Area and include grounds overlapping the ECC. Given adequate notification it is expected that these vessels will be in a position to avoid construction areas but that additional steaming time may be necessary to reach alternative grounds. The sensitivity is therefore medium.

13.7.116. Pelagic trawl and purse seine fleets are considered to have moderate-high availability of alternative fishing grounds and a wide operational range throughout the North Sea, Celtic Sea and West of Scotland. Assuming prior notification which will allow fishers to plan fishing activities, the sensitivity of the receptor is therefore, considered to be low for pelagic trawl fleet.

13.7.117. For all other fleets, given the importance of inshore waters and the proximity of the grounds from shore out to the Array Area with key ports of Peterhead and Fraserburgh, the sensitivity of increased steaming times is considered to be medium.

SIGNIFICANCE OF EFFECT

13.7.118. UK demersal otter trawl: the magnitude of the impact is deemed to be medium adverse and the sensitivity of the receptor is medium. The effect will therefore be of moderate adverse significance, which is significant in EIA terms.

13.7.119. UK and non-UK pelagic fleets: the magnitude of the impact is deemed to be low adverse and the sensitivity of the receptor is low. The effect will therefore be of minor adverse significance, which is not significant in EIA terms.

13.7.120. All other commercial fisheries receptors: the magnitude of the impact is deemed to be low adverse and the sensitivity of the receptor is medium. The effect will therefore be of minor adverse significance, which is not significant in EIA terms.

Table 13-17 Significance of additional steaming to alternative fishing grounds for vessels that would otherwise fish within the Proposed Development

Receptor/Location	Magnitude	Sensitivity	Significance
UK demersal otter trawl	Medium	Medium	Moderate
UK demersal seine	Low	Medium	Minor
UK pelagic otter trawl and purse seine	Low	Low	Minor
Non-UK pelagic otter trawl and purse seine	Low	Low	Minor
UK scallop dredge	Low	Medium	Minor
UK potting	Low	Medium	Minor
UK gear with hooks	Low	Medium	Minor

SECONDARY MITIGATION AND RESIDUAL EFFECT

13.7.121. UK demersal otter trawl: Commitments in relation to commercial fisheries are outlined in Section 13.6, including a FMMS, with an Outline FMMS provided in Volume 4, Appendix 4 (Outline Fisheries Management and Mitigation Strategy). As defined in the Outline FMMS, and described for the secondary mitigation related to reduced access, the Developer is committed to an Obstacle Free Zone within the Array Area (Figure 13.8), an adaptation fund throughout the construction phase and monitoring of fisheries activity. As defined in the Outline FMMS, the Developer is committed to early communication of construction related activities to allow fishers to plan their activities appropriately. Based on these commitments, the effect of increased steaming time is mitigated as far as possible, thereby reducing the potential for the requirement to transit to alternative grounds. The residual effect is therefore reduced to minor adverse significance for UK demersal otter trawl.

IMPACT 7 INCREASED SNAGGING RISK, WHICH COULD RESULT IN LOSS OR DAMAGE TO FISHING GEAR

13.7.122. The under construction and physical presence of semi-constructed infrastructure on the seabed represents potential snagging points for fishing gear and could lead to damage to, or loss of, fishing gear. The safety aspects including potential loss of life as a result of snagging risk are assessed within Volume 2, Chapter 14 (Shipping and Navigation).

13.7.123. Throughout the construction phase, safety zones will be applied for including up to 500m around structures where vessels are undertaking construction work and 50m around partially completed or completed surface piercing structures prior to commissioning of the wind farm.

MAGNITUDE OF IMPACT

13.7.124. In the instance that snagging does occur, the Developer will work to the protocols laid out within the guidance produced by the FLOWW group and Recommendations for Fisheries Liaison: Best Practice Guidance for Offshore Renewable Developers (FLOWW, 20146), in particular section 11: Dealing with claims for loss or damage of gear.

13.7.125. Snagging poses a risk to fishing equipment and in extreme cases may potentially lead to capsize of vessel and crew fatalities, as well as damage to 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 of fishing gear with infrastructure/cables on the seabed is the most hazardous to the vessel and crew due to the possibility of capsizing.

13.7.126. It is considered likely that fishermen will operate appropriately (adhering to Safety Zones and exclusion zones, and avoiding under construction infrastructure and cable protection at the defined locations) given adequate notification of the locations of any snagging hazards; and are highly likely to avoid the under construction infrastructure and cable protection within the Proposed Development.

13.7.127. Based on the embedded mitigation measures that and the commitment to follow standard protocols should snagging occur, the magnitude is considered to be low for all fleets.

SENSITIVITY OF RECEPTOR

13.7.128. Due to the nature and operation of mobile demersal gear (it is actively towed and 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 all mobile demersal fisheries.

13.7.129. Potting and line/jigging gear show a lower vulnerability as the gear is placed, not towed and is less likely to penetrate the seabed. The sensitivity of potters and line/jigging vessels is considered to be low.

13.7.130. Pelagic trawl gear does not come into contact with the seabed and therefore has low vulnerability to snagging seabed infrastructure, although snagging infrastructure within the water column remains a possibility. The sensitivity of pelagic trawl fleets is considered to be medium.

SIGNIFICANCE OF EFFECT

13.7.131. UK demersal otter trawl, demersal seine, scallop dredge and UK and non-UK pelagic otter trawl and purse seine fleets: the magnitude of the impact is deemed to be low adverse and the sensitivity of the receptor is medium. The effect will therefore be of minor adverse significance, which is not significant in EIA terms.

13.7.132. UK potting and hook and line fleets: the magnitude of the impact is deemed to be low adverse and the sensitivity of the receptor is low. The effect will therefore be of minor adverse significance, which is not significant in EIA terms.

Table 13-18 Significance of increased snagging risk, which could result in loss or damage to fishing gear

Receptor/Location	Magnitude	Sensitivity	Significance
UK demersal otter trawl	Low	Medium	Minor
UK demersal seine	Low	Medium	Minor
UK pelagic otter trawl and purse seine	Low	Medium	Minor

Receptor/Location	Magnitude	Sensitivity	Significance
Non-UK pelagic otter trawl and purse seine	Low	Medium	Minor
UK scallop dredge	Low	Medium	Minor
UK potting	Low	Low	Minor
UK gear with hooks	Low	Low	Minor

SECONDARY MITIGATION AND RESIDUAL EFFECT

13.7.133. No additional commercial fisheries mitigation is considered necessary because the likely effect in the absence of further mitigation (beyond the commitments outlined in Section 13.6) is not significant in EIA terms.

OPERATION AND MAINTENANCE

IMPACT 8 REDUCTION IN ACCESS TO, OR EXCLUSION FROM ESTABLISHED FISHING GROUNDS WITHIN THE ARRAY AREA

13.7.134. Reduction in access to, or exclusion from established fishing grounds within the Array Area may arise due to the physical presence of the wind turbines and floating foundations, including mooring and anchoring systems, OEP(s) and inter-array and interconnector cabling, as well as operation and maintenance activities within the Array Area.

13.7.135. Given the mooring line radius of 1,500 m and minimum turbine spacing of 1,000 m, it is assumed that fishing is not prohibited from resumption but is unlikely to resume within the Array Area throughout the operation and maintenance phase. This impact is long term, occurring throughout the operational lifetime of 35 years.

MAGNITUDE OF IMPACT

13.7.136. The construction impact assumed that fishing would not resume within the Array Area for a period of four years, the operation and maintenance impact assumes fishing would not resume for a longer duration of 35 years. Fishers are likely to have adapted to the presence of the Array Area during the 4 year construction phase by changing their operations to avoid the Array Area. This response and adaptation will continue throughout the operational phase. The magnitude of impact during the operation and maintenance phase is therefore assessed at the same level as construction impact 1.

13.7.137. The magnitude of impact is therefore as described for construction impact 1, summarised as high for UK demersal otter trawl and UK and non-UK pelagic otter trawl and purse seine fleets; medium for UK demersal seine and dredge; low for UK potting; and negligible for UK hook and line.

SENSITIVITY OF RECEPTOR

13.7.138. The sensitivity is as described for construction impact 1, summarised as high for demersal otter trawl, demersal seine, dredge, potting, hook and line and pelagic otter trawl and purse seine UK fishing fleets; and low for the non-UK pelagic otter trawl and purse seine fishing fleet.

SIGNIFICANCE OF EFFECT

13.7.139. UK demersal otter trawl: the magnitude of the impact is deemed to be high adverse and the sensitivity of the receptor is high. The effect will therefore be of major adverse significance, which is significant in EIA terms.

13.7.140. UK demersal seine: the magnitude of the impact is deemed to be medium adverse and the sensitivity of the receptor is high. The effect will therefore be of moderate adverse significance, which is significant in EIA terms.

13.7.141. UK pelagic otter trawl and purse seine: the magnitude of the impact is deemed to be high adverse and the sensitivity of the receptor is high. The effect will therefore be of major adverse significance, which is significant in EIA terms.

13.7.142. Non-UK pelagic otter trawl and purse seine: the magnitude of the impact is deemed to be high adverse and the sensitivity of the receptor is low. The effect will therefore be of minor adverse significance, which is not significant in EIA terms.

13.7.143. UK scallop dredge: the magnitude of the impact is deemed to be medium adverse and the sensitivity of the receptor is high. The effect will therefore be of moderate adverse significance, which is significant in EIA terms.

13.7.144. UK potting: the magnitude of the impact is deemed to be low adverse and the sensitivity of the receptor is high. The effect will therefore be of minor adverse significance, which is not significant in EIA terms.

13.7.145. UK gear with line and hooks: the magnitude of the impact is deemed to be negligible and the sensitivity of the receptor is high. The effect will therefore be of negligible significance, which is not significant in EIA terms.

Table 13-19 Significance of reduction in access to, or exclusion from established fishing grounds within the Array Area

Receptor/Location	Magnitude	Sensitivity	Significance
UK demersal otter trawl	High	High	Major
UK demersal seine	Medium	High	Moderate
UK pelagic otter trawl and purse seine	High	High	Major
Non-UK pelagic otter trawl and purse seine	High	Low	Minor
UK scallop dredge	Medium	High	Moderate
UK potting	Low	High	Minor
UK gear with line and hooks	Negligible	High	Negligible

SECONDARY MITIGATION AND RESIDUAL EFFECT

13.7.146. Secondary mitigation includes the following commitments:

- An Obstacle Free Zone within the Array Area (as described in construction impact and presented in Figure 13.8);
- Commercial fisheries activity monitoring during first two years of operation;
- Fisheries fund to support specific projects or research agreed with the commercial fishing stakeholders.

13.7.147. The Developer is committed to a Fisheries Fund during the first five years of the operational phase. This is not intended to compensate individual fishing businesses, but to provide funding to support the overall fisheries where significant effects have been identified i.e., the haddock, scallop and herring fisheries. The administrative functionality of the Fisheries Fund will be determined in consultation with the fishing industry and defined in the Final FMMS.

13.7.148. Following application determination, further work will explore the potential opportunity for this Fisheries Fund to be jointly delivered at a strategic regional level.

13.7.149. Based on the commitment to an Obstacle Free Zone, monitoring and Fisheries Fund, the residual effect is reduced to moderate adverse significance for the UK demersal otter trawl and UK pelagic otter trawl/purse seine fleets, and therefore is significant in EIA terms; and minor adverse significance or negligible for all other fleets, which is not significant in EIA terms.

13.7.150. This assessment and the resulting moderate adverse residual effect for UK demersal otter trawl and UK pelagic otter trawl/purse seine fleets takes account of the long term (35 year) exclusion from the Array Area for these fleets. While the Developer is committed to the Obstacle Free Zone and a five-year Fisheries Fund, the assessment assumes fishing will not resume within the remainder of the Array Area during the entirety of the operational phase. Knowledge from the fishing industry has highlighted the southern and western portion of the Array Area as extremely important to fisheries. On this basis, it is not possible to lower the significance of effect beyond moderate adverse for the UK demersal otter trawl and pelagic trawl fleets.

Table 13-20 Secondary mitigation and residual effect of reduction in access to, or exclusion from established fishing grounds within the Array Area

Receptor/Location	Significance	Secondary Mitigation	Residual Effect
UK demersal otter trawl	Major	FMMS, Obstacle Free Zone and fisheries fund	**Moderate**
UK demersal seine	Moderate		Minor
UK pelagic otter trawl and purse seine	Major		**Moderate**
Non-UK pelagic otter trawl and purse seine	Minor	FMMS	Minor
UK scallop dredge	Moderate	FMMS, Obstacle Free Zone and fisheries fund	Minor
UK potting	Minor	FMMS	Minor
UK gear with hooks	Negligible	FMMS	Negligible

IMPACT 9 REDUCTION IN ACCESS TO, OR EXCLUSION FROM ESTABLISHED FISHING GROUNDS WITHIN THE OFFSHORE ECC

13.7.151. The assessment assumes that commercial fisheries will be prevented from actively fishing within a total area of 0.405 km^2 within the offshore ECC, based on the worst case scenario that up to 50% of the length of the offshore ECC may require cable protection including: rock placement, concrete mattresses, grout/rock bags, frond mattresses. In addition to 0.405 km^2 that is permanently unavailable (due to cable protection), there will be temporarily 500 m safety zones around major maintenance activities related to remedial cable burial and cable repairs, with an assumption of one failure per cable per five years.

13.7.152. ESCA (2018) notes that cables are potentially subsea hazards, and that while great effort is made to bury and protect them, mariners should never assume that cables are completely buried. Furthermore, the Mariners Handbook advises that: every care should be taken to avoid

anchoring, trawling, fishing, dredging, drilling or carrying out any other activity in the vicinity of cables which might damage them (UK Hydrographic Office [UKHO], 2004).

13.7.153. In addition, the MCA guidance MGN661 (MCA, 2021), advises that fishing vessels should avoid fishing activity near either side of submarine cables in order to minimize the risk of damage as much as possible.

13.7.154. Notwithstanding this, subsea cables are widespread throughout the North Sea, providing power and telecommunications links, and it is understood that fishing does take place in the vicinity of subsea cables (Kingfisher Information Service - Offshore Renewable & Cable Awareness (KIS-ORCA) 2019). The Developer is a member of FLOWW and is actively working with fishing industry representatives to facilitate coexistence in relation to fishing and cables.

13.7.155. The assessment is undertaken on the understanding that it is illegal to wilfully, or negligently, break or damage any submarine cable and that burial, or other forms of protection, and routine burial surveys or other activities undertaken by the cable owner do not indemnify other seabed users should their activities result in damage to it.

MAGNITUDE OF IMPACT

13.7.156. For the purposes of this assessment, it is assumed that fishers will be well informed of the location and integrity of the offshore ECC (locations of protection, details of routine cable integrity surveys and location and schedule for any maintenance works), and that based on this knowledge will seek to exploit grounds across the offshore ECC with caution. The assessment therefore assumes that fishing will resume within the vicinity of the export cables, and that fishers will comply with MGN661 (MCA, 2021).

13.7.157. 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.

13.7.158. Gear targeting pelagic species does not normally come into contact with the seabed and therefore the presence of the offshore ECC will not affect potential fishing opportunities for UK and non-UK pelagic trawl and purse seine and hook and line fishing fleets.

13.7.159. Given that fishing is likely to resume across the majority of the offshore ECC, with exception of the cable protection and final location of the cable, the magnitude is considered to be low for all fishing fleets.

SENSITIVITY OF RECEPTOR

13.7.160. The sensitivity is as described for construction impact 2, summarised as medium for demersal otter trawl, demersal seine, dredge and potting fishing fleets; and low for hook and line and UK and non-UK pelagic otter trawl and purse seine fishing fleets.

SIGNIFICANCE OF EFFECT

13.7.161. UK demersal otter trawl, demersal seine, scallop dredge and potting: the magnitude of the impact is deemed to be low adverse and the sensitivity of the receptor is medium. The effect will therefore be of minor adverse significance, which is not significant in EIA terms.

13.7.162. UK gear with line and hooks and UK and non-UK pelagic otter trawl and purse seine: the magnitude of the impact is deemed to be low adverse and the sensitivity of the receptor is low. The effect will therefore be of minor adverse significance, which is not significant in EIA terms.

Table 13-21 Significance of reduction in access to, or exclusion from established fishing grounds within the offshore ECC

Receptor/Location	Magnitude	Sensitivity	Significance
UK demersal otter trawl	Low	Medium	Minor
UK demersal seine	Low	Medium	Minor
UK pelagic otter trawl and purse seine	Low	Low	Minor
Non-UK pelagic otter trawl and purse seine	Low	Low	Minor
UK scallop dredge	Low	Medium	Minor
UK potting	Low	Medium	Minor
UK gear with hooks	Low	Low	Minor

SECONDARY MITIGATION AND RESIDUAL EFFECT

13.7.163. No additional commercial fisheries mitigation is considered necessary because the likely effect in the absence of further mitigation (beyond the commitments outlined in Section 13.6) is not significant in EIA terms.

IMPACT 10 DISPLACEMENT LEADING TO GEAR CONFLICT AND INCREASED FISHING PRESSURE ON ADJACENT GROUNDS

13.7.164. Loss of access or exclusion from fishing grounds during operation and maintenance of the Proposed Development may lead to increases in fishing effort in other areas that may already be exploited thereby leading to gear conflict and increased pressure on adjacent fishing grounds.

MAGNITUDE OF IMPACT

13.7.165. During the operational phase it is assumed that fishing will resume within the ECC for all gears and will not resume within the Array Area for all fishing fleets. There is potential for fleets to adapt to the presence of the floating Array Area and for displacement effects to lessen with time. The magnitude of impact is therefore considered to be low for all fleets, except demersal otter trawl. For UK demersal otter trawl fleet, given the potential for ongoing impacts and the assumption that fishing would not resume within the Array Area, together with the identification of extremely important fishing area and accessibility of these 'inshore' grounds to local vessels, the magnitude is considered to be medium.

SENSITIVITY OF RECEPTOR

13.7.166. The sensitivity is as described for construction, summarised as medium for demersal otter trawl, demersal seine, dredge, potting, hook and line and UK pelagic otter trawl and purse seine fishing fleets; and low for the non-UK pelagic otter trawl and purse seine fishing fleets.

SIGNIFICANCE OF EFFECT

13.7.167. UK demersal otter trawl: the magnitude of the impact is deemed to be medium adverse and the sensitivity of the receptor is medium. The effect will therefore be of moderate adverse significance, which is significant in EIA terms.

13.7.168. UK demersal seine, UK pelagic trawl and purse seine, scallop dredge, potting and line and hooks: the magnitude of the impact is deemed to be low adverse and the sensitivity of the

receptor is medium. The effect will therefore be of minor adverse significance, which is not significant in EIA terms.

13.7.169. Non-UK pelagic otter trawl and purse seine: the magnitude of the impact is deemed to be low adverse and the sensitivity of the receptor is low. The effect will therefore be of minor adverse significance, which is not significant in EIA terms.

Table 13-22 Significance of displacement leading to gear conflict and increased fishing pressure on adjacent grounds

Receptor/Location	Magnitude	Sensitivity	Significance
UK demersal otter trawl	Medium	Medium	Moderate
UK demersal seine	Low	Medium	Minor
UK pelagic otter trawl and purse seine	Low	Medium	Minor
Non-UK pelagic otter trawl and purse seine	Low	Low	Minor
UK scallop dredge	Low	Medium	Minor
UK potting	Low	Medium	Minor
UK gear with hooks	Low	Medium	Minor

SECONDARY MITIGATION AND RESIDUAL EFFECT

13.7.170. Commitments in relation to commercial fisheries are outlined in Section 13.6, including a FMMS, with an Outline FMMS provided in Volume 4, Appendix 4 (Outline Fisheries Management and Mitigation Strategy). As defined in the Outline FMMS, and described for the secondary mitigation related to reduced access, the Developer is committed to an Obstacle Free Zone within Array Area (Figure 13.8), a fisheries fund during the first five years of the operation and maintenance phase and monitoring of fisheries activity. As defined in the Outline FMMS, the Developer is committed to early communication of maintenance related activities to allow fishers to plan their activities appropriately. Based on these commitments, the effect of reduced access is mitigated as far as possible, thereby reducing the potential for displacement. The residual effect is therefore reduced to minor adverse significance for all receptors.

IMPACT 11 DISTURBANCE OF COMMERCIALLY IMPORTANT FISH AND SHELLFISH RESOURCES LEADING TO DISPLACEMENT OR DISRUPTION OF FISHING ACTIVITY

13.7.171. Habitat loss, EMF and noise disturbances during the operation and maintenance phase may decrease or displace commercially important fish and shellfish populations from the area. This section assesses the subsequent effect 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.

MAGNITUDE OF IMPACT

13.7.172. Detailed assessments of the following potential operation and maintenance impacts have been undertaken in Volume 2, Chapter 10 (Fish and Shellfish Ecology):

- Permanent and/or long-term habitat loss/alteration due to the addition of infrastructure to the area;
- EMF impacts arising from cables during operational phase;

- Ghost fishing due to lost fishing gear becoming entangled in installed infrastructure;
- Introduction of new hard substrates and potential for fish aggregation; and
- UWN and vibration from operational WTGs and vessels.

13.7.173. The fish and shellfish ecology assessment found all operation and maintenance impacts to be of negligible to minor adverse significance for all fish and shellfish receptors. The potential effect on resources is not expected to be beyond what could be discernible from baseline conditions for fish and shellfish resources.

13.7.174. The magnitude of impact is predicted to be of regional spatial extent, of relevance to international fishing fleets, of long-term duration and to affect the receptor directly. The magnitude is therefore considered to be low for all species and all potential resource impacts.

SENSITIVITY OF RECEPTOR

13.7.175. Exposure to the impact is likely and commercial fleets targeting key species may be affected, including haddock, whiting, herring, mackerel, scallop, brown crab, lobster, and other demersal finfish.

13.7.176. Due to the range of areas targeted and the distribution of key commercial species throughout the northern, central and southern North Sea, all fleets are deemed to be of low vulnerability and high recoverability. The sensitivity of the receptor for all fisheries is therefore, considered to be medium.

SIGNIFICANCE OF EFFECT

13.7.177. All fleets: the magnitude of the impact is deemed to be low and the sensitivity of the receptor is medium. The effect will, therefore, be of minor adverse significance, which is not significant in EIA terms.

Table 13-23 Significance of disturbance of commercially important fish and shellfish resources leading to displacement or disruption of fishing activity

Receptor/Location	Magnitude	Sensitivity	Significance
UK demersal otter trawl	Low	Medium	Minor
UK demersal seine	Low	Medium	Minor
UK pelagic otter trawl and purse seine	Low	Medium	Minor
Non-UK pelagic otter trawl and purse seine	Low	Medium	Minor
UK scallop dredge	Low	Medium	Minor
UK potting	Low	Medium	Minor
UK gear with hooks	Low	Medium	Minor

SECONDARY MITIGATION AND RESIDUAL EFFECT

13.7.178. No additional commercial fisheries mitigation is considered necessary because the likely effect in the absence of further mitigation (beyond the commitments outlined in Section 13.6) is not significant in EIA terms.

IMPACT 12 INCREASED VESSEL TRAFFIC ASSOCIATED WITH THE PROPOSED DEVELOPMENT WITHIN FISHING GROUNDS LEADING TO INTERFERENCE WITH FISHING ACTIVITY

13.7.179. This section assesses the likely significant effects arising from project related vessel traffic and changes to shipping patterns as a result of any potential navigational channels leading to interference with fishing activity (reduced access) during operation and maintenance phase.

MAGNITUDE OF IMPACT

13.7.180. The maximum number of project vessel return trips during the operation and maintenance period is 259 annually and will include vessels which are RAM. The maximum number of vessels on site at one time during the operation and maintenance period is 11.

13.7.181. As per the construction phase as described under Impact 5, project vessels will be managed by marine coordination, carry AIS and be compliant with relevant Flag State regulations. Also, safety zones will be applied for including up to 500 m around structures where vessels are undertaking major maintenance work.

13.7.182. The magnitude of impact of interference of fishing activity due to the presence and transiting of maintenance vessels during the operation and maintenance phase is decreased compared to in the construction phase given that fewer project vessels will generally be on-site at any time, noting the much longer duration of the operation and maintenance phase. Based on the low level of project related vessel activity across a long time period, the magnitude is therefore, considered to be low for all fisheries.

SENSITIVITY OF RECEPTOR

13.7.183. The sensitivity is as described for construction impact 5, summarised as medium for the potting fishing fleet; and low for demersal otter trawl, demersal seine, dredge, line and pelagic otter trawl fishing fleets.

SIGNIFICANCE OF EFFECT

All fleets: the magnitude of the impact is deemed to be low and the sensitivity of the receptor is low. The effect will, therefore, be of minor adverse significance, which is not significant in EIA terms.

Table 13-24 Significance of increased vessel traffic associated with the Proposed Development within fishing grounds leading to interference with fishing activity

Receptor/Location	Magnitude	Sensitivity	Significance
UK demersal otter trawl	Low	Low	Minor
UK demersal seine	Low	Low	Minor
UK pelagic otter trawl and purse seine	Low	Low	Minor
Non-UK pelagic otter trawl and purse seine	Low	Low	Minor
UK scallop dredge	Low	Low	Minor
UK potting	Low	Low	Minor
UK gear with hooks	Low	Low	Minor

SECONDARY MITIGATION AND RESIDUAL EFFECT

13.7.184. No additional commercial fisheries mitigation is considered necessary because the likely effect in the absence of further mitigation (beyond the commitments outlined in Section 13.6) is not significant in EIA terms.

IMPACT 13 ADDITIONAL STEAMING TO ALTERNATIVE FISHING GROUNDS FOR VESSELS THAT WOULD OTHERWISE FISH WITHIN THE PROPOSED DEVELOPMENT

13.7.185. A detailed Navigational Risk Assessment (NRA) (Volume 3, Appendix 14.1 (Navigational Risk Assessment)) has been undertaken and is discussed in Volume 2, Chapter 14 (Shipping and Navigation), which includes full consideration of commercial fishing vessels while transiting (e.g. from a collision and allision perspective). This assessment focuses on the likely significant effects arising from longer steaming distances to alternative fishing grounds that would have otherwise been targeted within the Proposed Development, including all related infrastructure within the Array Area and offshore ECC.

MAGNITUDE OF IMPACT

13.7.186. The magnitude of impact of increased steaming times due to the presence of the Proposed Development during the operation and maintenance phase is expected to be the same or similar to that during construction for all commercial fishing fleets. While the operational phase in longer duration (35 years) compared to construction, it is expected that fishing vessels will adjust to the presence of the Array Area over time. It is also noted that commercial fishing vessels may choose to transit through the Array Area during the operation and maintenance phase. It is predicted that the impact will affect the receptor directly. Based on the justifications above, the magnitude is therefore, as described for construction impact 6, summarised as medium for UK demersal otter trawl and low for all other fleets.

SENSITIVITY OF RECEPTOR

13.7.187. The sensitivity is as described for construction impact 6, summarised as medium for the demersal otter trawl, demersal seine, dredge, potting and hook and line fishing fleets; and low for UK and non-UK pelagic otter trawl fishing fleets.

SIGNIFICANCE OF EFFECT

13.7.188. UK demersal otter trawl: the magnitude of the impact is deemed to be medium adverse and the sensitivity of the receptor is medium. The effect will therefore be of moderate adverse significance, which is significant in EIA terms.

13.7.189. UK demersal seine, scallop dredge, potting and line and hooks: the magnitude of the impact is deemed to be low adverse and the sensitivity of the receptor is medium. The effect will therefore be of minor adverse significance, which is not significant in EIA terms.

13.7.190. UK and non-UK pelagic otter trawl and purse seine: the magnitude of the impact is deemed to be low adverse and the sensitivity of the receptor is low. The effect will therefore be of minor adverse significance, which is not significant in EIA terms.

Table 13-25 Significance of additional steaming to alternative fishing grounds for vessels that would otherwise fish within the Proposed Development

Receptor/Location	Magnitude	Sensitivity	Significance
UK demersal otter trawl	Medium	Medium	Moderate
UK demersal seine	Low	Medium	Minor
UK pelagic otter trawl and purse seine	Low	Low	Minor
Non-UK pelagic otter trawl and purse seine	Low	Low	Minor
UK scallop dredge	Low	Medium	Minor
UK potting	Low	Medium	Minor
UK gear with hooks	Low	Medium	Minor

SECONDARY MITIGATION AND RESIDUAL EFFECT

13.7.191. UK demersal otter trawl: Commitments in relation to commercial fisheries are outlined in Section 13.6, including a FMMS, with an Outline FMMS provided in Volume 4, Appendix 4 (Outline Fisheries Management and Mitigation Strategy). As defined in the Outline FMMS, and described for the secondary mitigation related to reduced access, the Developer is committed to an Obstacle Free Zone within the Array Area (Figure 13.8), a fisheries fund for the first five years of operation and monitoring of fisheries activity. As defined in the Outline FMMS, the Developer is committed to early communication of construction related activities to allow fishers to plan their activities appropriately. Based on these commitments, the effect of increased steaming time is mitigated as far as possible, thereby reducing the potential for the requirement to transit to alternative grounds. The residual effect is therefore reduced to minor adverse significance for UK demersal otter trawl.

IMPACT 14 INCREASED SNAGGING RISK, WHICH COULD RESULT IN LOSS OR DAMAGE TO FISHING GEAR

13.7.192. The physical presence of infrastructure on the seabed represents potential snagging points for fishing gear and could lead to damage to, or loss of, fishing gear. The safety aspects including potential loss of life as a result of snagging risk are assessed within Volume 2, Chapter 14 (Shipping and Navigation).

13.7.193. During operation and maintenance phase, a 500 m advisory safe passing distance around vessels undertaking major maintenance activities will be assumed around structures undergoing maintenance and associated vessels including remedial repair work to the offshore ECC.

13.7.194. Maintenance will include regular monitoring of cable burial integrity and condition of cable protection.

MAGNITUDE OF IMPACT

13.7.195. The protocols outlined for construction impact 7, will be followed during operational phase. The magnitude of effect is considered to be the same as during construction, summarised as low for all fleets.

SENSITIVITY OF RECEPTOR

13.7.196. The sensitivity is as described for construction impact 7, summarised as medium for demersal otter trawl, demersal seine, dredge, and pelagic trawl fishing fleets; and low for potting and line fishing fleets.

SIGNIFICANCE OF EFFECT

13.7.197. UK demersal otter trawl, demersal seine, scallop dredge and UK and non-UK pelagic otter trawl and purse seine fleets: the magnitude of the impact is deemed to be low adverse and the sensitivity of the receptor is medium. The effect will therefore be of minor adverse significance, which is not significant in EIA terms.

13.7.198. UK potting and hook and line fleets: the magnitude of the impact is deemed to be low adverse and the sensitivity of the receptor is low. The effect will therefore be of minor adverse significance, which is not significant in EIA terms.

Table 13-26 Significance of increased snagging risk, which could result in loss or damage to fishing gear

Receptor/Location	Magnitude	Sensitivity	Significance
UK demersal otter trawl	Low	Medium	Minor
UK demersal seine	Low	Medium	Minor
UK pelagic otter trawl and purse seine	Low	Medium	Minor
Non-UK pelagic otter trawl and purse seine	Low	Medium	Minor
UK scallop dredge	Low	Medium	Minor
UK potting	Low	Low	Minor
UK gear with hooks	Low	Low	Minor

SECONDARY MITIGATION AND RESIDUAL EFFECT

13.7.199. No additional commercial fisheries mitigation is considered necessary because the likely effect in the absence of further mitigation (beyond the commitments outlined in Section 13.6) is not significant in EIA terms.

DECOMMISSIONING

IMPACT 15 REDUCTION IN ACCESS TO, OR EXCLUSION FROM ESTABLISHED FISHING GROUNDS WITHIN THE ARRAY AREA

13.7.200. The effects of decommissioning activities are expected to be the same or similar to the effects from construction. The significance of effect is therefore major adverse for demersal otter trawl and UK pelagic trawl; and moderate adverse for demersal seine and scallop dredge, which is significant in EIA terms, and minor adverse for non-UK pelagic trawl and UK potting; and negligible for hook and line, which is not significant in EIA terms.

13.7.201. Secondary mitigation and residual effects are as described for Impact 1 in the construction phase.

IMPACT 16 REDUCTION IN ACCESS TO, OR EXCLUSION FROM ESTABLISHED FISHING GROUNDS WITHIN THE ECC

13.7.202. The effects of decommissioning activities are expected to be the same or similar to the effects from construction. The significance of effect is therefore moderate for UK demersal otter trawl, demersal seine, dredge and potting which is significant in EIA terms; and minor adverse for UK and non-UK pelagic trawl and hook and line, which is not significant in EIA terms.

13.7.203. Secondary mitigation and residual effects are as described for Impact 2 in the construction phase.

IMPACT 17 DISPLACEMENT LEADING TO GEAR CONFLICT AND INCREASED FISHING PRESSURE ON ADJACENT GROUNDS

13.7.204. The effects of decommissioning activities are expected to be the same or similar to the effects from construction. The significance of effect is therefore moderate for UK demersal otter trawl, demersal seine, dredge and potting which is significant in EIA terms; and minor adverse for UK and non-UK pelagic trawl and hook and line, which is not significant in EIA terms.

13.7.205. Secondary mitigation and residual effects are as described for Impact 3 in the construction phase.

IMPACT 18 DISTURBANCE OF COMMERCIALLY IMPORTANT FISH AND SHELLFISH RESOURCES LEADING TO DISPLACEMENT OR DISRUPTION OF FISHING ACTIVITY

13.7.206. The effects of decommissioning activities are expected to be the same or similar to the effects from construction. The significance of effect is therefore moderate for UK and non-UK pelagic trawl which is significant in EIA terms; and minor adverse for UK demersal otter trawl, demersal seine, dredge and potting and hook and line, which is not significant in EIA terms.

13.7.207. Secondary mitigation and residual effects are as described for Impact 4 in the construction phase.

IMPACT 19 INCREASED VESSEL TRAFFIC ASSOCIATED WITH THE PROPOSED DEVELOPMENT WITHIN FISHING GROUNDS LEADING TO INTERFERENCE WITH FISHING ACTIVITY

13.7.208. The effects of decommissioning activities are expected to be the same or similar to the effects from construction. The significance of effect is therefore minor for all fleets, which is not significant in EIA terms.

IMPACT 20 ADDITIONAL STEAMING TO ALTERNATIVE FISHING GROUNDS FOR VESSELS THAT WOULD OTHERWISE FISH WITHIN THE PROPOSED DEVELOPMENT

13.7.209. The effects of decommissioning activities are expected to be the same or similar to the effects from construction. The significance of effect is therefore moderate for UK demersal otter trawl which is significant in EIA terms; and minor for all other fleets, which is not significant in EIA terms.

IMPACT 21 INCREASED SNAGGING RISK, WHICH COULD RESULT IN LOSS OR DAMAGE TO FISHING GEAR

13.7.210. The effects of decommissioning activities are expected to be the same or similar to the effects from construction. The significance of effect is therefore minor for all fleets, which is not significant in EIA terms.

PROPOSED MONITORING

13.7.211. The aim of commercial fisheries monitoring is to understand variations in commercial fisheries activity in response to the construction of the Proposed Development and use this to inform future updates to the FMMS. The key objectives are to:

- Collate data on commercial fisheries landings and activity by ICES rectangle, including landing statistics and VMS data with the objective to extend the baseline assessment provided within the EIAR;
- Collate data on commercial fisheries landings by port monthly;
- Collate such other sources of evidence of commercial fisheries activity as may be reasonably available on a regular basis; and
- Monitor available data and evidence to better understand any variations and patterns in commercial fisheries activity.

13.7.212. Mitigation and/or any updates to the FMMS may be informed by an understanding of any changes in fishing activity as picked up by the monitoring proposed.

13.7.213. Table 13-27 describes proposed monitoring in support of secondary mitigation discussed above.

Table 13-27 Recommended Monitoring and Implementation for Commercial Fisheries Effects

Effect	Proposed Monitoring	Implementation Method
Reduction in access to, or exclusion from established fishing grounds from within the Array Area; Reduction in access to, or exclusion from established fishing grounds from within the ECC; and Displacement leading to gear conflict and increased fishing pressure on adjacent grounds	Review of MMO landings data by port to allow monitoring of size, target species, tonnage of catch and first sales value monthly; • For each port, monthly data will be analysed to determine live weight of key species landed by all vessels, specifically for herring, haddock, brown crab, lobster and scallop fisheries; and • Inter annual variations between monthly landings will be examined.	FMMS
	Additional sources of information will be reviewed to corroborate findings of the analysis of the MMO landing statistics and identify trends not detected by the MMO landings data. These additional data sources include: • Analysis of OFLO and guard vessel records (where available) • Analysis of marine traffic surveys in respect of fishing vessel activity (where available) • Analysis of Marine Coordination Centre records in respect of fishing vessel activity • Analysis of VMS data in respect of fishing vessel activity, based on annual geographic datasets produced by MMO for VMS on UK	

Effect	Proposed Monitoring	Implementation Method
	vessels • Consultation with the commercial fishing industry via the CFLO	

13.8. WHOLE PROJECT ASSESSMENT

13.8.1. The Proposed Development's infrastructure and activities are the focus of this EIAR. However, where the potential exists for onshore elements of the Project (the onshore infrastructure landward of MLWS) to impact the offshore receptors, these have been identified and assessed below in the Whole Project Assessment (WPA).

13.8.2. A separate onshore EIAR is being prepared which will provide a description of the onshore elements of the Project landward of MLWS, and an assessment of the associated likely significant effects.

CONSTRUCTION

13.8.3. The onshore Proposed Development will undertake HDD operations above MHWS, with an HDD exit point offshore (i.e. below MLWS). The impacts from the HDD exit point on commercial fisheries receptors have been assessed as part of impacts resulting from the construction of the offshore ECC as reported in Section 13.7.

13.8.4. It is not anticipated that there will be any additional impacts from the onshore Proposed Development on commercial fisheries receptors as all other activities from the onshore Proposed Development are fully terrestrial.

13.8.5. There is no potential for additive impacts between the onshore and offshore activities associated with the Project on commercial fisheries receptors during construction.

OPERATION AND MAINTENANCE

13.8.6. No continuous deposits or releases from onshore aspects of the Project into the marine environment are anticipated during the O&M phase of the Proposed Development.

13.8.7. There is no potential for additive impacts between the onshore and offshore activities on commercial fisheries receptors during O&M.

DECOMMISSIONING

13.8.8. There is no potential for additive impacts between the onshore and offshore activities on commercial fisheries receptors during decommissioning.

13.9. CUMULATIVE EFFECTS ASSESSMENT

CEA METHODOLOGY

13.9.1. Effects of the Proposed Development alone are generally spatially restricted to being near the Muir Mhòr Array Area and offshore ECC. However, certain impacts have the potential to be observed over a wider area. These cumulative effects are the effects of the Proposed Development, combined with the effects from other projects, on the same receptor or group of receptors.

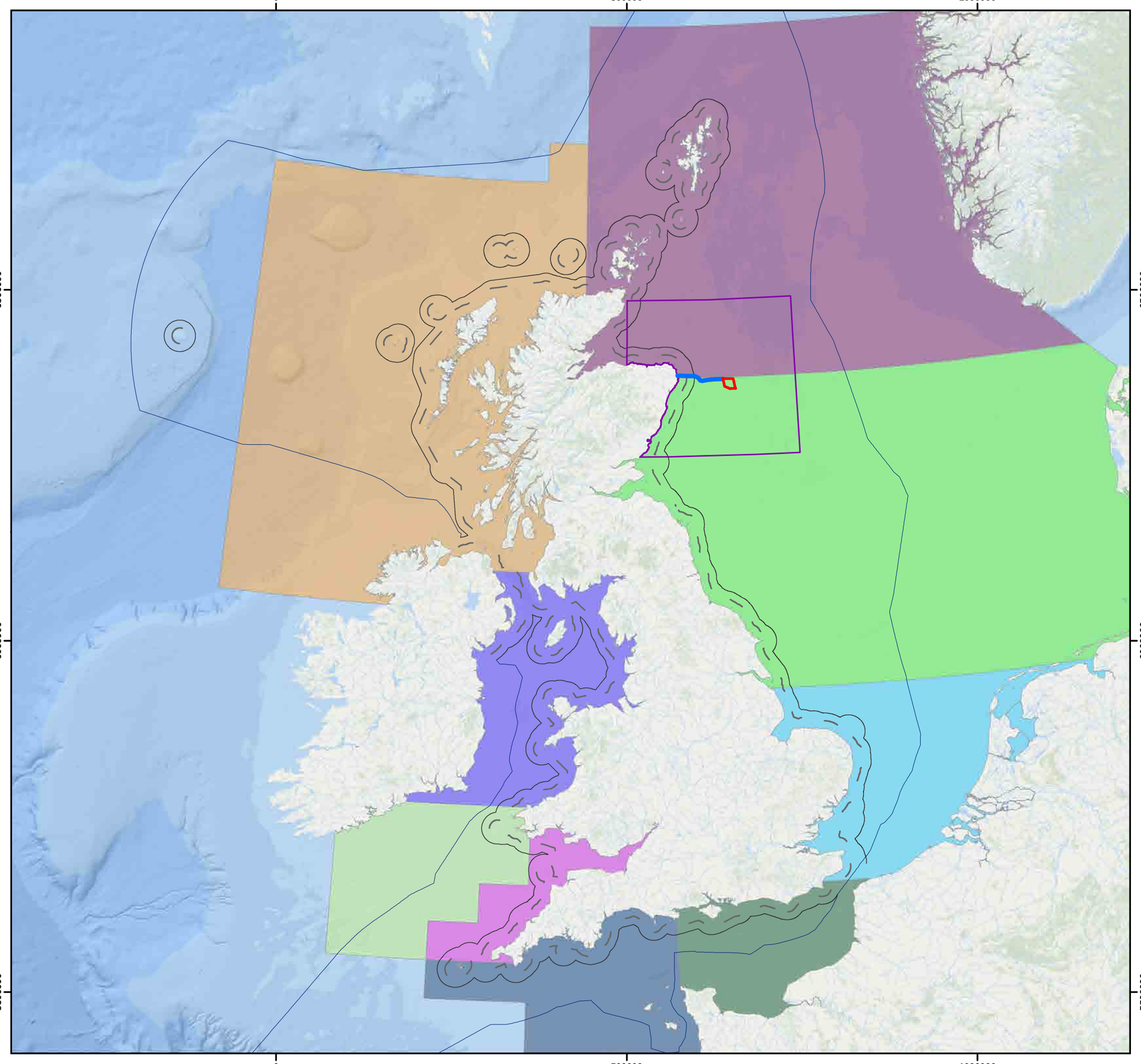
13.9.2. Volume 1, Chapter 6 (Environmental Impact Assessment Methodology) and Volume 3, Appendix 6.2 (Offshore Cumulative Effects) detail how potential cumulative effects will be assessed for the Proposed Development through a CEA. A CEA screening process has identified the relevant other plans, projects, and activities which are to be included in the assessment. Those plans/projects relevant to the CEA for commercial fisheries are highlighted in Figure 13.10. Information on each Tiered project is given in Table 13-28.

13.9.3. For each of these relevant plans/projects, the most up-to-date publicly available project parameters will be used to inform the CEA. Where information is not publicly available, the Developer will seek to consult and collaborate to obtain project parameters for assessment.

13.9.4. These other plans or projects may present different levels of potential cumulative effect when combined with the Proposed Development, informed by other plan/project's readiness and likelihood for actual operation. A tiered approach to the CEA is therefore applied here, allowing weighted assessment of cumulative effects. The cumulative effects are categorised as follows:

- **Tier 1 –** The whole project (both onshore and offshore elements), combined with plans/projects which have become operational since the baseline characterisation of the Proposed Development, operational projects that have an ongoing impact, plus those that are consented and are yet to be constructed or under construction;
- **Tier 2** All plans/projects assessed under Tier 1, plus those projects that have submitted a Scoping Report or those pending determination following a submitted application; and
- **Tier 3** – All plans/projects assessed under Tier 2, plus those projects that are not currently in the planning system but are likely to enter the planning system in the near future (e.g., Agreement for Lease (AfL) or projects at feasibility / early design stages) where information is available to inform the cumulative assessment and there is sufficient data confidence.

13.9.5. This CEA for commercial fisheries will consider the worst-case design scenario for each of the projects, plans and activities in line with the methodology outlined in in Volume 1, Chapter 6 (Environmental Impact Assessment Methodology) and Volume 3, Appendix 6.2 (Offshore Cumulative Effects). The commercial fisheries cumulative study area has been defined as the North Sea, which is considered to be representative of the fishing grounds exploited by the fleets active across the regional study area, for all fleets except scallop dredging. For scallop dredging the cumulative study area is defined at a UK level; this is because the UK fleet of scallop dredgers are nomadic in nature and target grounds across the North Sea, West of Scotland, Irish Sea and English Channel. The commercial fisheries cumulative study area is presented in Figure 13.9. The projects included in the cumulative study area are presented in Figure 13.10 and this is mapped with commercial fisheries data for demersal otter trawl (Figure 13.11), dredge (Figure 13.12), pelagic trawl (Figure 13.13) and potting (Figure 13.14).



Legend:

- Array Area
- Offshore Export Cable Corridor
- Commercial Fisheries Regional Study Area
- ICES statistical rectangles
- 12 nm boundary
- 6 nm boundary

Commercial Fisheries Cumulative Study Area

ICES Divisions

- North North Sea
- Central North Sea
- South North Sea
- West of Scotland
- Irish Sea
- Eastern English Channel
- Western English Channel
- Bristol Channel
- Celtic Sea

Project:	Report:
Muir Mhòr	Commercial Fisheries Chapter

Commercial Fisheries Cumulative Study Area

Figure:	Drawing No:
13.9	GoBe-0001

Revision:	Date:	Drawn:	Checked:
01	14/11/24	FN	BPHB

Map scale 1:5,500,000 @ A3

0 70 140 km

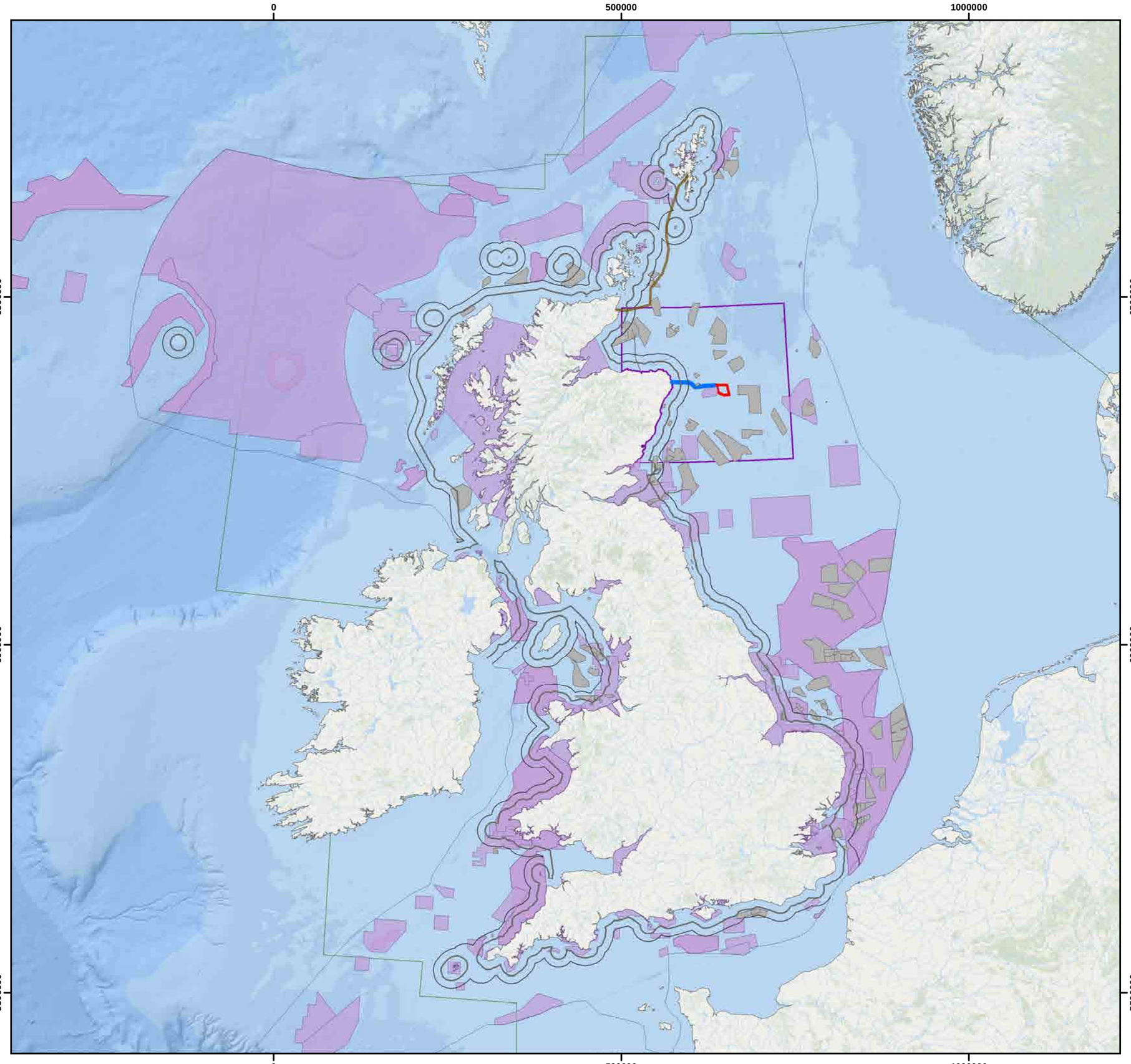
N

Co-ordinate system: ETRS 1989 UTM Zone 30N **EPSG:** 25830

MUIR MHÒR OFFSHORE WIND FARM

A joint venture between Fred. Olsen Seawind & Vattenfall

Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors



Legend:

- Array Area
- Offshore Export Cable Corridor
- Commercial Fisheries Cumulative Study Area
- Commercial Fisheries Regional Study Area
- ICES statistical rectangles
- 12 nm boundary
- 6 nm boundary
- Offshore Wind Farm Sites
- Proposed Subsea Cables
- Marine Protected Areas

Project:	Report:
Muir Mhòr	Commercial Fisheries Chapter

Commercial Fisheries
Cumulative Plans and Projects

Figure: 13.10	Drawing No: GoBe-0001		
Revision:	Date:	Drawn:	Checked:
01	14/11/24	FN	BPHB

Map scale 1:5,500,000 @ A3

0 70 140 km

N

Co-ordinate system: ETRS 1989 UTM Zone 30N **EPSG:** 25830

MUIR MHÒR
OFFSHORE WIND FARM
A joint venture between Fred. Olsen Seawind & Vattenfall

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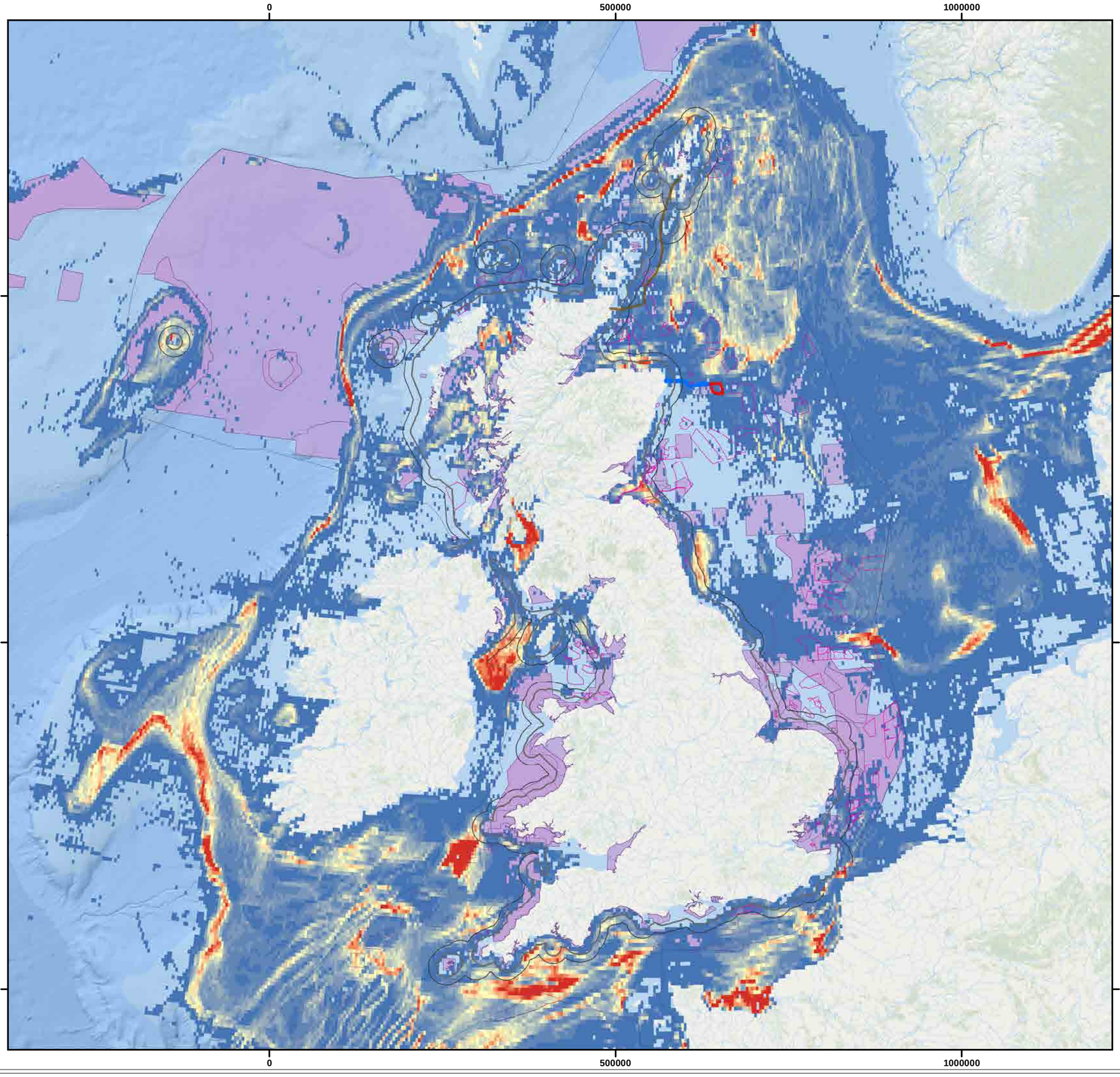

Legend:

- Array Area
- Offshore Export Cable Corridor
- 12 nm boundary
- 6 nm boundary
- Offshore Wind Farm Sites
- Proposed Subsea Cables
- Marine Protected Areas

Demersal Otter Trawl (EU and UK vessels ≥12m)
Average Annual Surface Swept Area Ratio (2016-2020)

- 0.0 - 0.6
- 0.7 - 1.3
- 1.4 - 1.9
- 2.0 - 2.6
- 2.7 - 3.2
- 3.3 - 3.9
- 4.0 - 4.5
- 4.6 - 5.1
- 5.2 - 5.8
- 5.9 - 6.4
- 6.5 - 7.1
- 7.2 - 7.7
- 7.8 - 8.4
- 8.5 - 9.0
- 9.1 - 23.2

Project:	Report:
Muir Mhòr	Commercial Fisheries Chapter

Commercial Fisheries
Cumulative Plans and Projects
Demersal Otter Trawl (UK and EU 12m and over)

Figure: 13.11	Drawing No: GoBe-0001		
Revision:	Date:	Drawn:	Checked:
01	14/11/24	FN	BPHB

Map scale 1:5,500,000 @ A3

0 70 140 km

Co-ordinate system: ETRS 1989 UTM Zone 30N **EPSG:** 25830

MUIR MHÒR OFFSHORE WIND FARM
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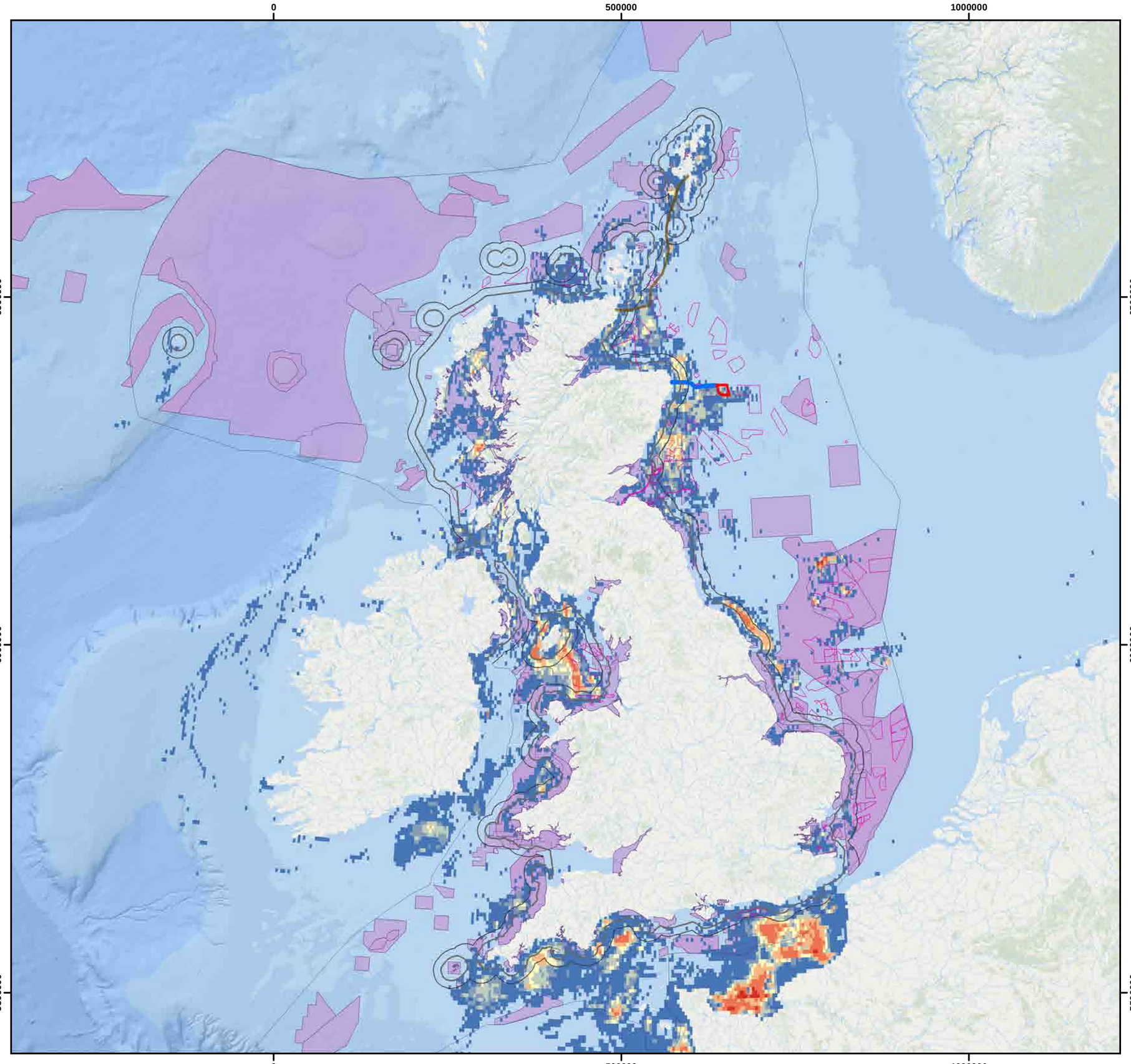

Legend:

- Array Area
- Offshore Export Cable Corridor
- 12 nm boundary
- 6 nm boundary
- Offshore Wind Farm Sites
- Proposed Subsea Cables
- Marine Protected Areas

Dredge (EU and UK vessels ≥12m)

Average Annual Surface Swept Area Ratio (2016-2020)

- 0.0 - 0.1
- 0.2
- 0.3 - 0.4
- 0.5 - 0.6
- 0.7 - 1.0
- 1.1 - 2.0
- 2.1 - 3.8

Project:	Report:
Muir Mhòr	Commercial Fisheries Chapter

Commercial Fisheries
Cumulative Plans and Projects
Dredge (UK and EU 12m and over)

Figure: 13.12	Drawing No: GoBe-0001		
Revision:	Date:	Drawn:	Checked:
01	14/11/24	FN	BPHB

Map scale 1:5,500,000 @ A3

0 70 140 km

N

Co-ordinate system: ETRS 1989 UTM Zone 30N **EPSG:** 25830

MUIR MHÒR OFFSHORE WIND FARM

A joint venture between Fred. Olsen Seawind & Vattenfall

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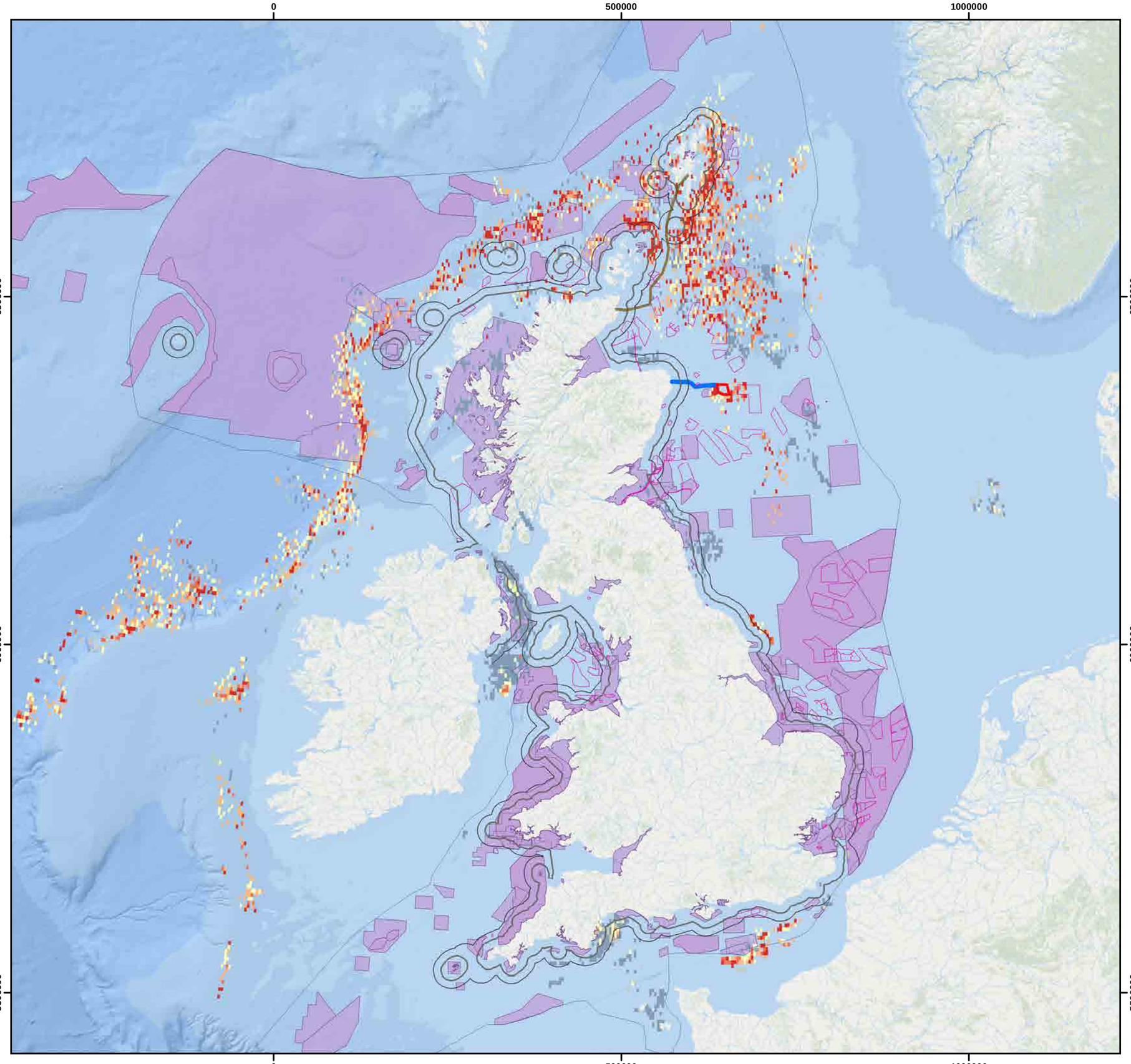


Legend:

- Array Area
- Offshore Export Cable Corridor
- 12 nm boundary
- 6 nm boundary
- Offshore Wind Farm Sites
- Proposed Subsea Cables
- Marine Protected Areas

Pelagic Trawl (UK vessels ≥15m)
First Sales Value
Total value, £

- £0.02 - £5,000.00
- £5,000.01 - £10,000.00
- £10,000.01 - £25,000.00
- £25,000.01 - £50,000.00
- £50,000.01 - £75,000.00
- £75,000.01 - £267,000.00

Project:	Report:
Muir Mhòr	Commercial Fisheries Chapter

Commercial Fisheries
Cumulative Plans and Projects
Pelagic 2016-2020 (UK 15m and over)

Figure: 13.13	Drawing No: GoBe-0001		
Revision:	Date:	Drawn:	Checked:
01	14/11/24	FN	BPHB

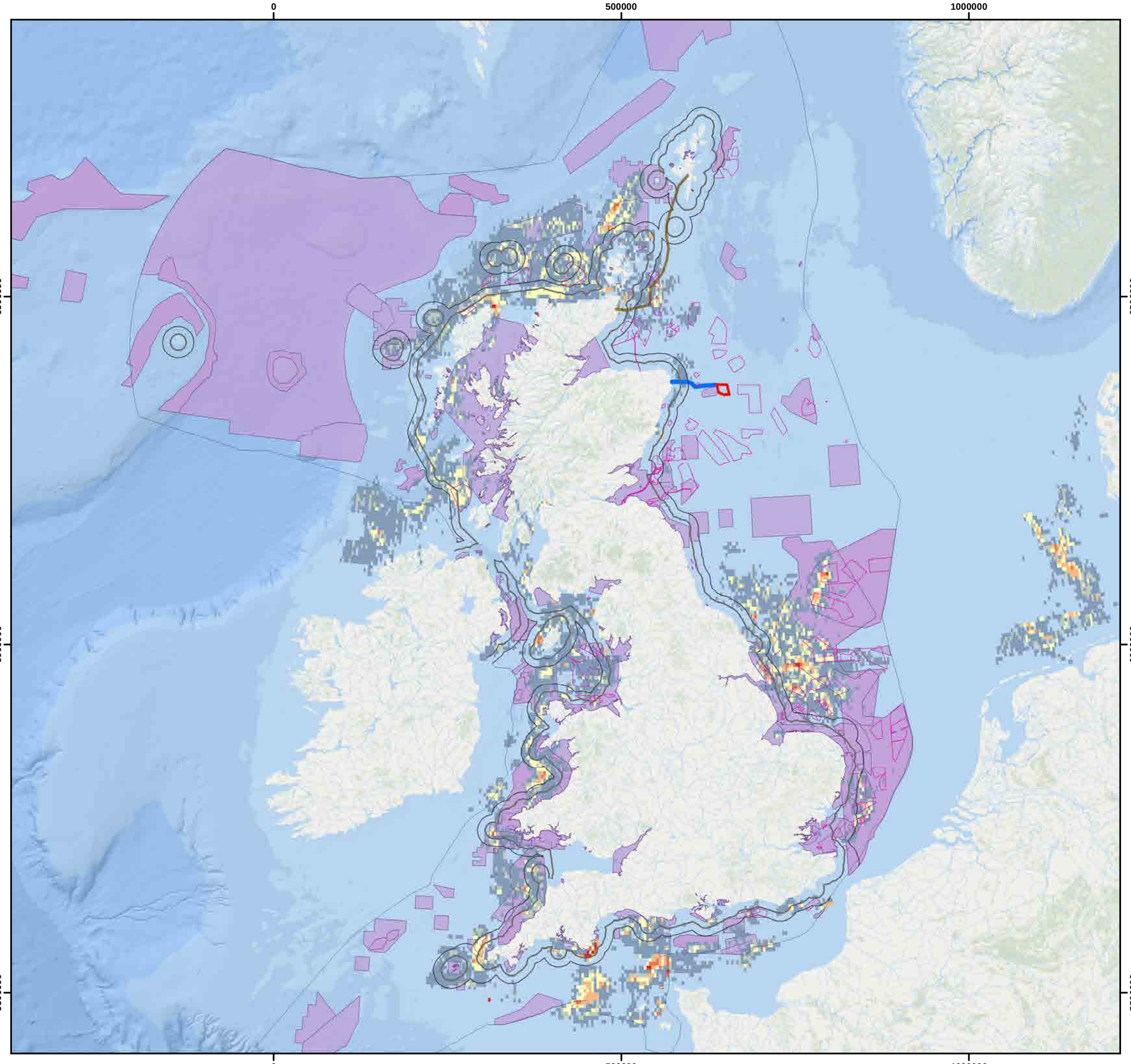
Map scale 1:5,500,000 @ A3

0 70 140 km

Co-ordinate system: ETRS 1989 UTM Zone 30N **EPSG:** 25830

MUIR MHÒR
OFFSHORE WIND FARM
A joint venture between Fred. Olsen Seawind & Vattenfall

Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors



Legend:

- Array Area
- Offshore Export Cable Corridor
- 12 nm boundary
- 6 nm boundary
- Offshore Wind Farm Sites
- Proposed Subsea Cables
- Marine Protected Areas

Potting (UK vessels ≥15m)
First Sales Value
Total value, £

- £0.01 - £5,000.00
- £5,000.01 - £10,000.00
- £10,000.01 - £25,000.00
- £25,000.01 - £50,000.00
- £50,000.01 - £75,000.00
- £75,000.01 - £145,000.00

Project:	Report:
Muir Mhòr	Commercial Fisheries Chapter

Commercial Fisheries
Cumulative Plans and Projects
Potting 2016-2020 (UK 15m and over)

Figure: 13.14	Drawing No: GoBe-0001		
Revision:	Date:	Drawn:	Checked:
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Map scale 1:5,500,000 @ A3

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MUIR MHÒR OFFSHORE WIND FARM
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Service Layer Credits: Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

13.9.6. The range of potential cumulative impacts that are identified as relevant to CEA, is a subset of those considered for project alone CEA assessment. This is because some of the potential impacts identified and assessed for the project alone, are localised and temporary in nature. It is considered therefore, that these potential impacts have limited or no potential to interact with similar changes associated with other plans or projects. These have therefore not been taken forward for detailed assessment.

13.9.7. It is considered that other renewable projects in the North Sea, West of Scotland, Celtic Sea and English Channel have the potential to reduce access to fishing grounds, especially where floating foundations are proposed for offshore wind farm developments. This could lead to the potential cumulative effect of temporary (during construction and decommissioning) and long term (during operation and maintenance) loss or restricted access to fishing grounds. This incremental loss of fishing grounds is often termed 'spatial squeeze' and is a growing concern within the fishing industry. The loss of access to fishing grounds may lead to displacement at a cumulative level, where vessels are exploratory fishing and focusing effort in areas outside of cumulative developments. This could lead to the cumulative effect of incremental displacement throughout UK waters. This displacement effect and where a displaced fisher chooses to direct the displaced effort can be difficult to assign to a specific project, given that fishing operators are responding to multiple developments.

13.9.8. In addition, incremental disruption to fish and shellfish species could lead to cumulative displacement of the commercial resource. For example, at the ecosystem level offshore wind farms and other developments in the marine environment could act as aggregation devices, attracting a different assemblage of species (which could in itself provide new commercial opportunity), or there could be barrier effects. The fish and shellfish ecology assessment has considered potential cumulative effects to specific species and species groups, as presented within Volume 2, Chapter 10 (Fish and Shellfish Ecology), with potential knock-on effects considered within this chapter for commercially exploited resources.

13.9.9. The remaining impacts to commercial fisheries, including interference with fishing activity due to project-related vessel movements, snagging risk and increased transit times are considered to be highly localised to specific projects. Given the scale of project alone effects, any cumulative, additive effects across these impacts within the commercial fisheries cumulative study area would be negligible across projects.

13.9.10. To summarise, impacts that are scoped into the CEA are:

- Reduction in access to, or exclusion from established fishing grounds within the Proposed Development;
- Displacement leading to gear conflict and increased fishing pressure on adjacent grounds; and
- Disturbance of commercially important fish and shellfish resources leading to displacement or disruption of fishing activity.

13.9.11. The approach to CEA screening of projects for commercial fisheries has taken a wide and inclusive approach, including many developments that are in operational phase. This is because these developments are recognised to continue to pose a potential impact on commercial fisheries through incremental loss of fishing grounds.

Table 13-28 Other Plans/Projects included in the commercial fisheries CEA.

Plan/Project	Summary	Status	Distance from Array Area (km)	Distance from offshore ECC (km)	Construction dates (if relevant)	Operational by (if relevant)	Summary of interaction with Proposed Development
Tier 1							
Peterhead to Drax HVDC (E4D3)	Power Cables	Operational	47.69	0.00	2024	2025	Operational phase interacts with O&M and construction phase of the Proposed Development
Hywind OWF	Offshore Energy	Operational	35.56	0.06	N/A	2024	Operational phase interacts with O&M and construction phase of Proposed Development.
Hywind ECC	Power Cables	Operational	36.61	0.00	N/A	2024	Operational phase interacts with O&M and construction phase of Proposed Development.
Green Volt OWF	Offshore Energy	Consented	36.26	35.64	2025-2027	2028	Operational phase interacts with O&M and construction phase of Proposed Development.
Green Volt ECC	Power Cables	Consented	29.40	0.00	2025-2027	2028	Operational phase interacts with O&M and construction phase of Proposed Development.
Peterhead Harbour (CR071)	Disposal site	Operational	63.68	1.13	N/A	2024	Operational phase interacts with O&M and construction phase of the Proposed Development
Peterhead to South Humber (E4L5)	Power Cables	Operational	47.70	3.70	2024-2028	2029	Operational phase interacts with O&M and construction phase of the Proposed Development
Fraserburgh (CR060)	Disposal site	Operational	72.62	13.52	N/A	2024	Operational phase interacts with O&M and construction phase of the Proposed Development
North Buchan Ness (CR080)	Disposal site	Operational	59.85	0.98	N/A	2024	Operational phase interacts with O&M and construction phase of the Proposed Development
Shetland HVDC Link Power Cable	Power Cables	Under construction	151.06	112.13	2024-2025	2026	Operational phase interacts with O&M and construction phase of the Proposed Development
Pentland Floating OWF and ECC	Offshore Energy	Consented	224.99	171.38	2024-2025	2026	Operational phase interacts with O&M and construction phase of the Proposed Development
Inch Cape OWF and ECC	Offshore Energy	Under construction	125.84	105.72	2024-2025	2026	Operational phase interacts with O&M and construction phase of the Proposed Development
Moray West OWF and ECC	Offshore Energy	Under construction	144.31	87.53	2024	2025	Operational phase interacts with O&M and construction phase of the Proposed Development
Moray East OWF and ECC	Offshore Energy	Operational	131.63	79.87	N/A	2024	Operational phase interacts with O&M and construction phase of the Proposed Development
Beatrice OWF and ECC	Offshore Energy	Operational	150.21	96.83	N/A	2024	Operational phase interacts with O&M and construction phase of the Proposed Development
Neart Na Gaoithe OWF and ECC	Offshore Energy	Under construction	150.54	134.89	2021-2024	2025	Operational phase interacts with O&M and construction phase of the Proposed Development

Plan/Project	Summary	Status	Distance from Array Area (km)	Distance from offshore ECC (km)	Construction dates (if relevant)	Operational by (if relevant)	Summary of interaction with Proposed Development
Other English east coast OWFs and ECCs (including Dogger Bank OWFs, Hornsea Project Four, Hornsea Project Three, Outer Dowsing, Sheringham Shoal and Dudgeon Extension, Norfolk Vanguard West, Norfolk Vanguard East, East Anglia Three, East Anglia Two, East Anglia One North)	Offshore Energy	Various OWFs either under construction or in operation, with potential for an overlap in cumulative impacts associated with construction activities and the operation phase. There is a potential for cumulative impacts arising from reduction in access to fishing grounds, displacement and fisheries resource effects.					
Other North Sea OWFs off Belgium, Netherlands, Germany, and Denmark OWF and ECC	Offshore Energy	Various OWFs either under construction or in operation, with potential for an overlap in cumulative impacts associated with construction activities and the operation phase. There is a potential for cumulative impacts arising from reduction in access to fishing grounds, displacement and fisheries resource effects.					
Other Channel OWFs off the coast of England and France OWF and ECC	Offshore Energy	Various OWFs either under construction or in operation, with potential for an overlap in cumulative impacts associated with construction activities and the operation phase. There is a potential for cumulative impacts arising from reduction in access to fishing grounds, displacement and fisheries resource effects.					
Tier 2							
Salamander OWF and ECC	Offshore Energy	Application submitted	Array - 28.37 ECC – 30.88	Array - 9.10 ECC – 0.00	2065-2030	2031	Construction phase interacts with the construction phase of the Proposed Development and operational phase interacts with O&M and construction phase of the Proposed Development.
Marram OWF	Offshore Energy	Scoping report submitted	58.90	58.35	2030	Unknown	Construction phase interacts with the construction phase of the Proposed Development and operational phase interacts with O&M and construction phase of the Proposed Development.
Buchan OWF	Offshore Energy	Scoping report submitted	89.95	79.21	2028-2032	2033	Construction phase interacts with the construction phase of the Proposed Development and operational phase interacts with O&M and construction phase of the Proposed Development.
Ossian OWF	Offshore Energy	Application submitted	51.38	62.42	2031-2034	Unknown	Construction phase interacts with the construction phase of the Proposed Development.
Bellrock OWF	Offshore Energy	Scoping report submitted	52.35	70.78	2028-2031	2032	Construction phase interacts with the construction phase of the Proposed Development and operational phase interacts with O&M and construction phase of the Proposed Development**.**
Morven OWF	Offshore Energy	Scoping report submitted	58.16	60.80	2027-2029	2030	Construction phase interacts with the construction phase of the Proposed Development and operational phase interacts with O&M and construction phase of the Proposed Development.
Broadshore OWF	Offshore Energy	Scoping report submitted	93.43	63.34	2028-2031	2032	Construction phase interacts with the construction phase of the Proposed Development and operational phase interacts with O&M and construction phase of the Proposed Development.

Plan/Project	Summary	Status	Distance from Array Area (km)	Distance from offshore ECC (km)	Construction dates (if relevant)	Operational by (if relevant)	Summary of interaction with Proposed Development
Berwick Bank OWF	Offshore Energy	Application submitted	110.04	107.31	2025-2033	2034	Construction phase interacts with the construction phase of the Proposed Development and operational phase interacts with O&M and construction phase of the Proposed Development.
Cenos OWF	Offshore Energy	Scoping report submitted	105.68	125.48	2029-2033	2034	Construction phase interacts with the construction phase of the Proposed Development and operational phase interacts with O&M and construction phase of the Proposed Development.
Caledonia OWF	Offshore Energy	Scoping report submitted	116.97	62.84	2028-2030	2031	Construction phase interacts with the construction phase of the Proposed Development and operational phase interacts with O&M and construction phase of the Proposed Development.
Ayre OWF and ECC	Offshore Energy	Scoping report submitted	161.99	135.86	2029-2031	2032	Construction phase interacts with the construction phase of the Proposed Development and operational phase interacts with O&M and construction phase of the Proposed Development.
West of Orkney OWF and ECC	Offshore Energy	Application submitted	243.82	193.71	2028-2031	2032	Construction phase interacts with the construction phase of the Proposed Development and operational phase interacts with O&M and construction phase of the Proposed Development.
Spiorad na Mara OWF and ECC	Offshore Energy	Scoping report submitted	363.77	300.58	2028-2031	2032	Construction phase interacts with the construction phase of the Proposed Development and operational phase interacts with O&M and construction phase of the Proposed Development.
Culzean OWF and ECC	Offshore Energy	Application submitted	139.18	158.05	2025	2026	Construction phase interacts with the construction phase of the Proposed Development and operational phase interacts with O&M and construction phase of the Proposed Development.
Stromar OWF and ECC	Offshore Energy	Scoping report submitted	127.79	95.74	2026-2030	2031	Construction phase interacts with the construction phase of the Proposed Development and operational phase interacts with O&M and construction phase of the Proposed Development.
Arven OWF and ECC	Offshore Energy	Scoping report submitted	296.49	294.65	2030-2033	2034	Construction phase interacts with the construction phase of the Proposed Development and operational phase interacts with O&M and construction phase of the Proposed Development.
Other English east coast OWFs and ECCs (including North Falls, Five Estuaries, Outer Dowsing)		Various OWFs with Applications submitted, with potential for an overlap in cumulative impacts associated with construction activities and the operation phase. There is a potential for cumulative impacts arising from reduction in access to fishing grounds, displacement and fisheries resource effects.					
UK Marine Protected Areas (MPA) network	Nature designations	Network of Special Areas of Conservation (SAC), Special Protected Areas (SPA), Marine Conservation Zones (MCZ) are designated but management measures may not yet be implemented. Implementation of management measures for all MPAs expected from 2024 onwards with potential for an overlap in cumulative impacts associated with construction activities and the operation phase. There is a potential for cumulative impacts arising from reduction in access to fishing grounds and displacement.					

Plan/Project	Summary	Status	Distance from Array Area (km)	Distance from offshore ECC (km)	Construction dates (if relevant)	Operational by (if relevant)	Summary of interaction with Proposed Development
Tier 3							
Aspen OWF	Offshore Energy	Concept/Early Planning	20.05	29.88	2027-2031	Unknown	Construction phase interacts with the construction phase of the Proposed Development and operational phase interacts with O&M and construction phase of the Proposed Development.
Bowdun OWF	Offshore Energy	Concept/Early Planning	52.50	44.60	2029-2031	2032	Construction phase interacts with the construction phase of the Proposed Development and operational phase interacts with O&M and construction phase of the Proposed Development.
Campion OWF	Offshore Energy	Concept/Early Planning	12.56	29.91	Unknown	Unknown	Construction phase interacts with the construction phase of the Proposed Development and operational phase interacts with O&M and construction phase of the Proposed Development.
Sinclair OWF and ECC	Offshore Energy	Concept/Early Planning	105.11	76.94	Unknown	Unknown	Construction phase interacts with the construction phase of the Proposed Development and operational phase interacts with O&M and construction phase of the Proposed Development.
Scaraben OWF and ECC	Offshore Energy	Concept/Early Planning	94.18	70.93	Unknown	Unknown	Construction phase interacts with the construction phase of the Proposed Development and operational phase interacts with O&M and construction phase of the Proposed Development.
Flora OWF and ECC	Offshore Energy	Concept/Early Planning	24.12	0.00	Unknown	Unknown	Construction phase interacts with the construction phase of the Proposed Development and operational phase interacts with O&M and construction phase of the Proposed Development.
Havbredey OWF and ECC	Offshore Energy	Concept/Early Planning	309.07	250.66	2032-2034	2035	Construction phase interacts with the construction phase of the Proposed Development.
Cedar OWF and ECC	Offshore Energy	Concept/Early Planning	65.58	86.78	Unknown	Unknown	Construction phase interacts with the construction phase of the Proposed Development and operational phase interacts with O&M and construction phase of the Proposed Development.
Beech OWF and ECC	Offshore Energy	Concept/Early Planning	128.30	141.73	2026-2027	2028	Construction phase interacts with the construction phase of the Proposed Development and operational phase interacts with O&M and construction phase of the Proposed Development.
Stoura OWF and ECC	Offshore Energy	Concept/Early Planning	328.51	328.42	Unknown	Unknown	Construction phase interacts with the construction phase of the Proposed Development and operational phase interacts with O&M and construction phase of the Proposed Development.

WORST CASE DESIGN SCENARIO CEA

13.9.12. The commercial fisheries CEA has been undertaken with respect to the details provided in Volume 1, Chapter 3 (Project Description). A 'worst case' design scenario has been selected for each cumulative impact which would lead to the greatest impact for all receptors or receptor groups, when selected from a range of values. Effects of greater adverse significance are not predicted to arise should any other development scenario, based on details within Volume 1, Chapter 3 (Project Description) (e.g., different infrastructure layout), to that assessed here, be taken forward in the final design scheme.

13.9.13. Table 13-29 presents the worst-case design scenario for each cumulative impact associated with the commercial fisheries CEA**,** along with justification.

Table 13-29 Worst Case Design Scenarios with respect to the Commercial Fisheries CEA

Cumulative Impact	Tier	Worst Case Design Scenario
All phases		
Reduction in access to, or exclusion from established fishing grounds Displacement leading to gear conflict and increased fishing pressure on adjacent grounds Disturbance of commercially important fish and shellfish resources leading to displacement or disruption of fishing activity	1	• The Proposed Development as described in Table 13-8; • Three power cables (Peterhead to Drax, Peterhead to South Humber, Shetland HVDC Link); • Three disposal sites (Peterhead Harbour, Fraserburgh, North Buchan Ness); • Three floating OWFs and associated ECC (Hywind, Green Volt and Pentland Floating); • Five fixed OWFs and associated ECC (Inch Cape, Moray West, Moray East, Beatrice, Neart Na Gaoithe); • Other English east coast OWFs and ECCs (including Dogger Bank OWFs, Hornsea Project Four, Hornsea Project Three, Sheringham Shoal and Dudgeon Extension, Norfolk Vanguard West, Norfolk Vanguard East, East Anglia Three, East Anglia Two, East Anglia One North); • Other North Sea OWFs off Belgium, Netherlands, Germany, and Denmark OWF and ECC; • Other Channel OWFs off the coast of England and France OWF and ECC.
Reduction in access to, or exclusion from established fishing grounds Displacement leading to gear conflict and increased fishing pressure on adjacent grounds Disturbance of commercially important fish and shellfish resources leading to displacement or disruption of fishing activity	2	• The Proposed Development as described in Table 13-8; • All Tier 1 projects; • Twelve floating OWFs and associated ECC (Arven, Ayre, Bellrock, Broadshore, Buchan, Caledonia, Cenos, Culzean, Marram, Ossian, Salamander, Stromar); • Four fixed OWFs and associated ECC (Berwick Bank, Morven, Spiorad na Mara, West of Orkney); • Other English east coast OWFs and ECCs (including North Falls, Five Estuaries, Outer Dowsing); • UK Marine Protected Areas (MPA) network.
Reduction in access to, or exclusion from established fishing grounds Displacement leading to gear	3	• The Proposed Development as described in Table 13-8; • All Tier 1 and Tier 2 projects; • Ten floating OWFs and associated ECC (Aspen,

conflict and increased fishing pressure on adjacent grounds		Beech, Bowdun, Campion, Cedar, Flora, Havbredey, Scaraben, Sinclair, Stoura).
Disturbance of commercially important fish and shellfish resources leading to displacement or disruption of fishing activity		

CONSTRUCTION CEA

REDUCTION IN ACCESS TO, OR EXCLUSION FROM ESTABLISHED FISHING GROUNDS

MAGNITUDE OF CUMULATIVE IMPACT

Tier 1

13.9.14. There is potential for cumulative reduction in access to or exclusion from established fishing grounds as a result of construction activities associated with the Proposed Development and other projects that are under construction, in operation or with planned decommissioning.

13.9.15. The Tier 1 projects include five fixed OWFs in Scottish waters, 13 fixed OWFs off the English east coast and other operational fixed OWFs in the North Sea and Channel, including off the coasts of France, Belgium, Netherlands, Germany, and Denmark. For OWFs within the UK jurisdiction, it is assumed that access would be possible for most gear types (with exception of pelagic trawl) and access to export cable routes for most mobile gears, potting and pelagic trawl (noting that while MGN 661 advises that mobile fishing vessels with penetrative gear avoid submarine cables, cables are typically buried or protected to allow trawling, with the exception of dredging). Three floating wind farms are included in the Tier 1 assessment (Green Volt, Hywind and Pentland Floating) and it is assumed that fishing will not resume within these floating projects during all their phases.

13.9.16. For the purposes of this assessment, this cumulative effect has been assessed within the North Sea, which is considered to be a reasonable extent for the fishing grounds exploited by the commercial fisheries receptors active across the commercial fisheries regional study area, for all fleets except scallop dredging. For scallop dredging this effect is assessed at a UK level; this is because the UK fleet of scallop dredgers are nomadic in nature and target grounds across the North Sea, West of Scotland, Irish Sea and English Channel. Fisheries data has been reviewed against the Tier 1 projects.

13.9.17. Demersal otter trawl and demersal seine activity occurs throughout the North Sea, with highly defined grounds for targeting *Nephrops* (related to muddy habitat) and less defined grounds when targeting whitefish/mixed demersal species, including haddock, whiting and cod. Defined grounds for *Nephrops* fishery are noted primarily across the cable routes of Tier 1 offshore wind farms, including in the Firth of Forth (Neart na Gaoithe and Inch Cape) and Moray Firth (Beatrice, Moray East and Moray West Offshore Wind Farms). Lower levels of demersal otter trawl activity are noted across the floating OWFs (Green Volt, Hywind and Pentland Floating) (Figure 13.11).

13.9.18. Scallop dredging is noted to occur across a number of Tier 1 projects in the North Sea: Beatrice, Moray East, Moray West and Dogger Bank A Offshore Wind Farms. Scallop dredging is evident within the 12 nm boundary adjacent to the northeast coast of Scotland, with potential interaction with export cable construction identified (Figure 13.12).

13.9.19. Pelagic otter trawl activity occurs primarily in the central areas of the northern North Sea (Figure 13.13). There is very limited overlap with Tier 1 projects.

13.9.20. Potting VMS spatial data is not fully representative of the UK potting fleet because the data is only available for vessels 15 m and over, while the majority of the potting fleet is less than 15 m in length. Nevertheless, the potting VMS data does indicate areas of high activity for the 15 m and over fleet, specifically in waters out to 12 nm (Figure 13.14).

13.9.21. A number of operational offshore wind farms are included in the Tier 1 assessment, which throughout their construction provided a range of mitigation directly to commercial fishing businesses. Fishermen have adapted their activities in response to the presence of these offshore wind farms, including both operating within the arrays (for example, by adapting how and where gear is used or set); avoiding construction areas and returning to fishing grounds across export cables post construction and in certain instances cable protection surveys to confirm resumption of fishing.

13.9.22. The offshore wind farms are located in areas where scallop dredgers, demersal otter trawls, pelagic trawls and potting activity were likely to have been operated, with varying degrees of effort. Overall, the commercial fishing fleets have adapted to the presence of the offshore wind farms and adjusted practices to allow fishing businesses to continue operation to some extent.

13.9.23. The potential for incremental loss of fishing grounds is recognised in the ABPmer (2022) spatial squeeze in fisheries report, which focused on assessment of mobile fishing gears in response to present and future scenarios for restricted access due to Marine Protected Areas (MPAs) (included in Tier 2 of this assessment) and offshore developments including offshore wind farms and cables.

13.9.24. The ABPmer study found that the spatial footprint of activities and policies that constrain mobile trawling gear types represents 23% of the UK EEZ area for the ‘present’ scenario (i.e. as of 2022). It is noted, however, that the scenarios for loss within the ABPmer (2022) report treat all areas equally, i.e. the report does not distinguish between areas that can actually be utilised (and are currently targeted) for fishing.

13.9.25. The ‘future 2030’ scenario predicted 36% of the UK EEZ would be restricted to trawling and the ‘future 2050’ worst case scenario predicted 49% of the UK EEZ would be restricted, with an area greater than 30,000 km^2 occupied by the renewable offshore wind sector. The ‘future 2050’ worst case scenario assumes mobile fishing would be restricted within all wind farms, which is noted to not necessarily be the case, but becomes the likely scenario for floating developments.

13.9.26. The ABPmer (2022) report highlights that the fishing industry has adapted to the ‘present’ scenario, based on the majority of restrictions being linked to nature conservation restrictions in waters deeper than 800 m, together with offshore wind farms sited in areas not previously intensively trawled.

13.9.27. Overall, it is considered that the fishing industry continue to adapt to operational projects included in the Tier 1 assessment, including active fishing within operational wind farms. This is expected to be the case for Tier 1 fixed foundation OWFs projects; with mitigation at individual project level and resumption of fishing during the operational phase.

13.9.28. Three floating OWFs are included in Tier 1. It is understood that these project are either located in areas that are not expected to cause disruption to commercial fishing fleets or have developed project-specific mitigation to avoid impacts (e.g., Green Volt).

13.9.29. The cumulative impact is predicted to be of international spatial extent, medium term duration, continuous and low reversibility. It is predicted that the impact will affect the receptor directly. Given the adaptation of the commercial fishing sector to operational offshore wind farm developments and the avoidance of key fishing grounds and project-level mitigation for Tier 1 floating OWFs, the magnitude is therefore, considered to be low for Tier 1 projects for all fishing fleets.

Tier 2

13.9.30. The Tier 2 cumulative assessment includes all Tier 1 projects plus eleven floating OWFs, three fixed OWF, together with the network of UK designated MPAs. Fisheries administrators across the UK are at various stages of implementing management measures within MPAs. The MMO recently (March 2024) implemented byelaws with prohibitions on bottom contact fishing gear within nine MPAs (MMO,2024). From a Scottish context, the Marine Directorate has implemented a series of Marine Conservation Orders (MCOs) and fisheries orders in MPAs and SACs, affective from 2022, and a series of possible MCOs and fisheries orders for other MPAs remains under consideration including a current consultation on proposals for measures across a series of offshore MPAs.

13.9.31. In terms of fishing activity, scallop dredge activity is notable within Caledonia, and to the north and west of Morven; demersal otter trawl activity is notable within Marram and Caledonia OWFs.

13.9.32. The scale of potential restrictions to the commercial fishing fleets is recognised, including through the ABPmer (2022) spatial squeeze analysis, as described under the Tier 1 assessment. Overall, there is potential for incremental loss of grounds to occur from Tier 2 floating offshore wind farms and nature conservation management. Potential mitigation packages for Tier 2 floating OWFs are not yet known or developed and therefore risk of significant cumulative impacts to loss of access remains for fishing fleets that typically operate across wider regional areas when targeting specific species.

13.9.33. The cumulative impact is predicted to be of international spatial extent, medium term duration, continuous and low reversibility. It is predicted that the impact will affect the receptor directly. Given the loss of access posed by the Tier 2 floating offshore wind farms, together with the anticipated introduction of fisheries management within the MPA network, the magnitude is therefore, considered to be medium for Tier 2 projects for demersal otter trawl, demersal seine, dredge fisheries and pelagic trawl and low for all other fishing fleets.

Tier 3

13.9.34. The additional floating offshore wind farms within Tier 3 cumulatively with the Proposed Development plus Tier 1 and Tier 2 raise the cumulative effect of loss or restricted access to fishing grounds, however this rise is considered to remain within the medium magnitude category (i.e., leading to moderate loss of access to fishing grounds) and does not enter the high magnitude category (i.e., leading to substantial loss of access to fishing grounds). The Tier 3 projects are not considered to raise the category of magnitude of impact beyond what is assessed for Tier 2, summarised as medium for demersal otter trawl, demersal seine, dredge fisheries and pelagic trawl and low for all other fishing fleets.

SENSITIVITY OF RECEPTOR

13.9.35. All commercial fishing fleets are sensitive to incremental loss of access to fishing grounds.

13.9.36. All commercial fishing fleets are deemed to be of high vulnerability, medium recoverability and medium-high value. The sensitivity of the receptor is therefore, considered to be medium.

SIGNIFICANCE OF CUMULATIVE EFFECT

13.9.37. UK demersal otter trawl, demersal seine, dredge fisheries and pelagic trawl: the magnitude of the cumulative impact is deemed to be medium adverse and the sensitivity of the receptor is medium. The cumulative effect will therefore be of moderate adverse significance, which is significant in EIA terms.

13.9.38. All other fleets: the magnitude of the cumulative impact is deemed to be low adverse and the sensitivity of the receptor is medium. The cumulative effect will therefore be of minor adverse significance, which is not significant in EIA terms.

Table 13-30 Significance of reduction in access to, or exclusion from established fishing grounds

Receptor/Location	Magnitude	Sensitivity	Significance
UK demersal otter trawl	Medium	Medium	Moderate
UK demersal seine	Medium	Medium	Moderate
UK pelagic otter trawl and purse seine	Medium	Medium	Moderate
Non-UK pelagic otter trawl and purse seine	Medium	Medium	Moderate
UK scallop dredge	Medium	Medium	Moderate
UK potting	Low	Medium	Minor
UK gear with hooks	Low	Medium	Minor

SECONDARY MITIGATION AND RESIDUAL CUMULATIVE EFFECTS

13.9.39. No further secondary mitigation is proposed beyond project alone mitigation.

13.9.40. The project alone mitigation has reduced the project alone effect from major to minor during construction and decommissioning, and from major to moderate adverse during the operational phase. This has been accounted for within the cumulative assessment of the project alone, together with other plans and projects. Strategic mitigation is not currently proposed across multiple offshore wind farm projects. The effect of management measures being implemented within MPAs is unmitigable by the Developer. The residual effect remains as presented in Table 13-30.

DISPLACEMENT LEADING TO GEAR CONFLICT AND INCREASED FISHING PRESSURE ON ADJACENT GROUNDS

MAGNITUDE OF CUMULATIVE IMPACT

Tier 1

13.9.41. The effect of displacement during construction 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 low magnitude of impact for reduced access to fishing grounds from Tier 1 projects and therefore an ongoing cumulative displacement effect is not expected to be recognisable beyond baseline conditions. Resumption of fishing within existing wind farms included in Tier 1 is assumed for scallop dredge, potting and demersal otter trawl and therefore displacement over time will have dissipated as commercial fishing fleets adapt and operate within fixed foundation wind farms. While pelagic trawl gear would not be feasible within Tier 1 wind farms, these are not located across grounds specifically targeted by pelagic trawl, and it is assumed that the opportunity to catch the fish outside wind farm area is not wholly lost.

13.9.42. Displacement is possible in response to the floating OWF Tier 1 projects. However, it is expected that this will be limited in nature due to the project-level mitigation and siting within lower levels of fishing activity. Furthermore, it is assumed that appropriately mitigated loss of access impacts associated with floating OWF projects would limit the effect of displacement.

13.9.43. Overall, based on the above justifications, the magnitude of impact of displacement is assessed as low for all fleets.

Tier 2

13.9.44. The effect of displacement during construction 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 medium magnitude of impact for reduced access to fishing grounds from Tier 2 projects cumulatively with the Proposed Development and Tier 1 projects, specifically due to the assumption that fishing will not resume within floating offshore wind farms and therefore displacement is expected.

13.9.45. The cumulative impact is predicted to be of international spatial extent, medium term duration, continuous and low reversibility. It is predicted that the impact will affect the receptor directly. Given the loss of access posed by floating OWF including in the Tier 2 assessment (Ayre, Bellrock, Broadshore, Buchan, Caledonia, Cenos, Culzean, Marram, Morven, Ossian, Salamander, Scaraben, Sinclair, Stromar OWFs) and knock-on displacement effects, together with the anticipated introduction of fisheries management within the MPA network, the magnitude is therefore, considered to be medium for Tier 2 projects.

Tier 3

13.9.46. The additional floating offshore wind farms within Tier 3 cumulatively with the Proposed Development plus Tier 1 and Tier 2 raise the cumulative effect of displacement, however this rise is considered to remain within the medium magnitude category (i.e., leading to moderate loss of access to fishing grounds) and does not enter the high magnitude category (i.e., leading to substantial loss of access to fishing grounds). The Tier 3 projects are not considered to raise the category of magnitude of impact beyond what is assessed for Tier 2, summarised as medium for all commercial fishing fleets.

SENSITIVITY OF RECEPTOR

13.9.47. All commercial fishing fleets are sensitive to displacement into other areas and are deemed to be of high vulnerability and medium recoverability. The sensitivity of the receptor is therefore, considered to be medium.

SIGNIFICANCE OF CUMULATIVE EFFECT

13.9.48. All fleets: the magnitude of the cumulative impact is deemed to be medium adverse and the sensitivity of the receptor is medium. The cumulative effect will therefore be of moderate adverse significance, which is significant in EIA terms.

Table 13-31 Significance of displacement leading to gear conflict and increased fishing pressure on adjacent grounds

Receptor/Location	Magnitude	Sensitivity	Significance
UK demersal otter trawl	Medium	Medium	Moderate
UK demersal seine	Medium	Medium	Moderate
UK pelagic otter trawl and purse seine	Medium	Medium	Moderate
Non-UK pelagic otter trawl and purse seine	Medium	Medium	Moderate
UK scallop dredge	Medium	Medium	Moderate
UK potting	Medium	Medium	Moderate

Receptor/Location	Magnitude	Sensitivity	Significance
UK gear with hooks	Medium	Medium	Moderate

SECONDARY MITIGATION AND RESIDUAL CUMULATIVE EFFECTS

13.9.49. No further secondary mitigation is proposed beyond project alone mitigation.

13.9.50. The project alone mitigation has reduced the project alone effect from moderate to minor during all phases. This has been accounted for within the cumulative assessment of the project alone, together with other plans and projects. Strategic mitigation is not currently proposed across multiple offshore wind farm projects. The effect of management measures being implemented within MPAs is unmitigable by the project. The residual effect remains as presented in Table 13-31.

DISTURBANCE OF COMMERCIALLY IMPORTANT FISH AND SHELLFISH RESOURCES LEADING TO DISPLACEMENT OR DISRUPTION OF FISHING ACTIVITY

MAGNITUDE OF CUMULATIVE IMPACT

Tier 1

13.9.51. The cumulative effects for fish and shellfish ecology have been assessed in Volume 2, Chapter 10 (Fish and Shellfish Ecology) covering the following effects during the construction phase:

13.9.52. Temporary threshold shift and behavioural changes resulting from underwater noise arising from noise and vibration underwater noise impacting fish and shellfish receptors; and

13.9.53. Temporary increase in suspended sediment and sediment deposition.

13.9.54. The underwater noise effects on fish and shellfish receptors are assessed in Volume 2, Chapter 10 (Fish and Shellfish Ecology) and predicted to be of negligible to minor adverse significance. Temporary increase in suspended sediment and sediment deposition may occur due to the installation of infrastructure as assessed in Volume 2, Chapter 10 (Fish and Shellfish Ecology) and predicted to be of minor adverse significance.

13.9.55. Overall, cumulative effects on fish and shellfish ecology during construction are assessed to be of negligible to minor adverse significance. Therefore, the magnitude of effect to commercial fisheries resources is assessed as low for all commercial fishery fleets.

Tier 2 and Tier 3

13.9.56. The Tier 2 and Tier 3 projects are not considered to raise the magnitude of impact beyond what is assessed for Tier 1, summarised as low for all commercial fishing fleets. This is due to any effects being highly localised to specific projects and not considered to result in any effect detectable at species stock levels.

SENSITIVITY OF RECEPTOR

13.9.57. All commercial fishing fleets are sensitive to displacement of their target resource.

13.9.58. All commercial fishing fleets are deemed to be of high vulnerability, medium recoverability and medium-high value. The sensitivity of the receptor is therefore, considered to be medium.

SIGNIFICANCE OF CUMULATIVE EFFECT

13.9.59. All fleets: the magnitude of the cumulative impact is deemed to be low adverse and the sensitivity of the receptor is medium. The cumulative effect will therefore be of minor adverse significance, which is not significant in EIA terms.

Table 13-32 Significance of disturbance of commercially important fish and shellfish resources leading to displacement or disruption of fishing activity

Receptor/Location	Magnitude	Sensitivity	Significance
UK demersal otter trawl	Low	Medium	Minor
UK demersal seine	Low	Medium	Minor
UK pelagic otter trawl and purse seine	Low	Medium	Minor
Non-UK pelagic otter trawl and purse seine	Low	Medium	Minor
UK scallop dredge	Low	Medium	Minor
UK potting	Low	Medium	Minor
UK gear with hooks	Low	Medium	Minor

SECONDARY MITIGATION AND RESIDUAL CUMULATIVE EFFECTS

13.9.60. No further secondary mitigation is proposed beyond project alone mitigation. The residual effects are as presented in Table 13-32.

OPERATION AND MAINTENANCE CEA

REDUCTION IN ACCESS TO, OR EXCLUSION FROM ESTABLISHED FISHING GROUNDS

13.9.61. Over time commercial fishing fleets are expected to adjust to the presence of offshore wind farms and, for certain gears, adapt to operate within fixed foundation array areas. However, given the inclusion of floating offshore wind farm projects within Tiers 1, 2 and 3, together with MPAs included at Tier 2, the effects of operation and maintenance activities are expected to be the same or similar to the effects from construction, summarised as moderate adverse for UK demersal otter trawl, demersal seine, dredge fisheries and pelagic trawl and minor adverse for all other fleets.

DISPLACEMENT LEADING TO GEAR CONFLICT AND INCREASED FISHING PRESSURE ON ADJACENT GROUNDS

13.9.62. Over time commercial fishing fleets are expected to adjust to the presence of offshore wind farms and for displacement effects to stabilize. However, given the inclusion of floating offshore wind farm projects within Tiers 1, 2 and 3, together with MPAs included at Tier 2, the level of displacement has the potential to have long term effects based on continuous competition for fishing grounds as spatial squeeze pressures increase. The effects of operation and maintenance activities are expected to be the same or similar to the effects from construction, summarised as moderate adverse for UK demersal otter trawl, demersal seine, dredge fisheries and pelagic trawl and minor adverse for all other fleets.

DISTURBANCE OF COMMERCIALLY IMPORTANT FISH AND SHELLFISH RESOURCES LEADING TO DISPLACEMENT OR DISRUPTION OF FISHING ACTIVITY

MAGNITUDE

Tier 1

13.9.63. The cumulative effects for fish and shellfish ecology have been assessed in Volume 2, Chapter 10 (Fish and Shellfish Ecology) covering the following effects during the operation and maintenance phase:

- Long-term habitat loss; and
- Effects to fish and shellfish receptors due to EMF from subsea electrical cabling.

13.9.64. Effects of long-term habitat loss is assessed in Volume 2, Chapter 10 (Fish and Shellfish Ecology) and highlights that while habitat loss may be locally significant and comprise a permanent change in seabed habitat within the footprint of the structures and scour and cable protection, the footprint of the area affected will be highly localised. Furthermore, the seabed habitats that would be affected are common and widespread in the region.

13.9.65. In relation to EMF, it is noted in Volume 2, Chapter 10 (Fish and Shellfish Ecology) that EMF levels in the vicinity of subsea cables are influenced by a variety of design and installation factors, including distance between cables, cable sheathing, number of conductors, and internal cable configuration. Based on similar technology and project designs, the extent of EMF emissions from the OWF projects considered in the cumulative impact assessment is also expected to be highly localised and restricted to areas within the immediate proximity of the cable lines i.e., within metres to tens of metres from cables.

13.9.66. Overall cumulative effects on fish and shellfish ecology during operation and maintenance are assessed to be of minor adverse significance. Therefore, the magnitude of effect to commercial fisheries resources is assessed as low for all commercial fishery fleets.

Tier 2 and 3

13.9.67. The Tier 2 and Tier 3 projects are not considered to raise the magnitude of impact beyond what is assessed for Tier 1, summarised as low for all commercial fishing fleets. This is due to any effects being highly localised to specific projects and not considered to result in any effect detectable at species stock levels.

SENSITIVITY OF RECEPTOR

13.9.68. All commercial fishing fleets are sensitive to displacement of their target resource.

13.9.69. All commercial fishing fleets are deemed to be of high vulnerability, medium recoverability and medium-high value. The sensitivity of the receptor is therefore, considered to be medium.

SIGNIFICANCE OF CUMULATIVE EFFECT

13.9.70. All fleets: the magnitude of the cumulative impact is deemed to be low adverse and the sensitivity of the receptor is medium. The cumulative effect will therefore be of minor adverse significance, which is not significant in EIA terms.

Table 13-33 Significance of disturbance of commercially important fish and shellfish resources leading to displacement or disruption of fishing activity

Receptor/Location	Magnitude	Sensitivity	Significance
UK demersal otter trawl	Low	Medium	Minor
UK demersal seine	Low	Medium	Minor
UK pelagic otter trawl and purse seine	Low	Medium	Minor
Non-UK pelagic otter trawl and purse seine	Low	Medium	Minor
UK scallop dredge	Low	Medium	Minor
UK potting	Low	Medium	Minor
UK gear with hooks	Low	Medium	Minor

SECONDARY MITIGATION AND RESIDUAL CUMULATIVE EFFECTS

13.9.71. No further secondary mitigation is proposed beyond project alone mitigation. The residual effects are as presented in Table 13-33.

DECOMMISSIONING CEA

13.9.72. The effects of decommissioning activities are expected to be the same or similar to the effects from construction for all cumulative effects.

PROPOSED MONITORING FOR CUMULATIVE EFFECTS

13.9.73. Monitoring beyond the Proposed Development alone monitoring across the commercial fisheries regional study area is not proposed for cumulative effects associated with Commercial Fisheries.

13.9.74. The Developer remains open to discuss potential cumulative monitoring options at a Regional Commercial Fisheries Working Group level.

13.10. TRANSBOUNDARY EFFECTS

13.10.1. A transboundary effect assessment assesses the commercial fisheries effects from the Proposed Development upon the interests of European Economic Areas (EEA States).

13.10.2. A screening of transboundary impacts has been carried out, which identified that there was the potential for transboundary effects to occur in relation to commercial fisheries. The potential transboundary impacts screened into the assessment for commercial fisheries are:

- Effects on commercial fishing fleets as a result of impacts from the Proposed Development on commercial fish stocks in the waters of EEA States; and
- Effects on commercial fishing fleets from all EEA countries as a result of constraints on foreign commercial fishing activities operating in the Proposed Development, including pelagic trawling, and other gears. These effects may include reduction in access to fishing grounds and potential displacement of fishing effort from the Array Area to alternative fishing grounds in EEA States, which will have direct implications to that fishing ground.

13.10.3. Effects on biological resources could occur over a range of ten to 100s of kilometres from the Proposed Development and could therefore interact with the following EEA states: Norway. Based on the minor to negligible significance of disruption to commercial species during all phases of the project, it is expected that the impact on stocks in the Norwegian EEZ will be negligible. Therefore, the potential transboundary impact of effects on commercial fish stocks in the waters of other EEA States on commercial fisheries is concluded to be not significant in EIA terms.

13.10.4. Effects on commercial fishing fleets could occur over a range of 100s of kilometres from the Array Area (affecting fleets from other states that operate in the vicinity of the Array Area) and could therefore interact with the following EEA states: the Netherlands, Germany, France, Denmark and Norway. Effects on these foreign commercial fishing fleets from EEA states, in terms of reduction in access to fishing grounds and displacement into alternative grounds including other EEZs, have therefore been intrinsically considered throughout the commercial fisheries EIA process and are consistent to those presented in the impact assessment (Section 13.7) and CEA (Section 13.9).

13.11. INTER-RELATED EFFECTS

13.11.1. Inter-related effects may occur due to multiple impacts on a receptor or a group of receptors from the Proposed Development. This includes the following:

- **Project Lifecycle Effects** - Interactions between impacts across different phases of the Proposed Development i.e., interaction of impacts across construction, operation and maintenance and decommissioning; and
- **Inter-related Receptor Effects** - Interactions between impacts on a receptor or group of receptors within an offshore Project stage (Inter-related Receptor Effects).

13.11.2. Project Lifecycle and Receptor led inter-related effects from commercial fisheries are presented in Table 13-34.

Table 13-34: Inter-Related Effects of commercial fisheries

Impact	Significant Inter-Related Effects
Project lifecycle effects	
Reduction in access to, or exclusion from established fishing grounds within the Array Area	Loss or restricted access to fishing grounds is considered to be temporary during construction and decommissioning and long term during the operation and maintenance phase. Buoyed construction area around the entirety of the Array Area as it is constructed, will lead to loss of access up to the point of commissioning in the operation and maintenance phase when it is also assumed the entirety of the Array Area will not be accessed for fishing. The effects on commercial fisheries across the phases 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.
Reduction in access to, or exclusion from established fishing grounds within the offshore ECC	
Displacement leading to gear conflict and increased fishing pressure on adjacent grounds	Fishing may be disrupted and displaced into other areas due to the loss of access during all phases of the project. Similarly, for loss of access, in the Array Area, the level of displacement experienced is expected to dissipate as fishers adapt to the presence of the Array Area. Therefore, 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.
Disturbance of commercially important fish and shellfish resources leading to displacement or disruption of fishing activity	Project lifetime inter-related effects are unlikely as the nature of potential impact is different during construction (underwater noise) and operation and maintenance phases (EMF, loss of habitat and increased SSCs and suspended sediments). Temporary and long term habitat loss which occurs across all phases is expected to be proportionally small in relation to habitat availability in the commercial fisheries regional study area. 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.
Increased vessel traffic associated with the Proposed Development within fishing grounds leading to interference with fishing activity	With the successful implementation of embedded measures (i.e. issue of NtMs), preparation of a FMMS, close liaison with the local vessels), no significant effects are predicted for the construction, operation and maintenance, and decommissioning phases of the Proposed Development. The majority of vessel traffic (resulting in interference with fishing) is predicted to peak during construction and decommissioning with reduced potential for interference during the operation and maintenance phase. 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.
Additional steaming to alternative fishing grounds for vessels that would otherwise fish within the Proposed Development	Impacts on steaming and transit times are expected to be highest during construction and decommissioning when areas undergoing installation/decommissioning activities will be avoided. Vessels may also choose to avoid transiting through the Array Area during operation and maintenance phase. 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.

Impact	Significant Inter-Related Effects
Increased snagging risk, which could result in loss or damage to fishing gear	Impacts due to gear snagging may occur during the construction and operation and maintenance phases due to the presence of floating wind turbine foundations and associated moorings and anchoring. At the end of the operational lifetime, it is expected that all structures above the seabed (with the exception of scour protection and cable protection) will be fully removed where feasible. Environmental conditions and sensitivities will also be considered since removal of structures may result in greater environmental impacts in comparison to leaving in situ. However, 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.
Receptor Led Effects	
An inter-related receptor led effect may occur from the combination of the reduction in access to fishing grounds and the subsequent displacement and increased pressure on adjacent grounds.	While these two affects may act together, given the proposed additional mitigation, it is considered that any inter-related effect will not be of any greater significance than those already assessed in isolation.

13.12. ASSESSMENT SUMMARY

13.12.1. A summary of the findings of the effects and cumulative effects assessments undertaken in Section 13.7 and Section 13.9 is given in Table 13-35 and Table 13-36 respectively. This includes residual effect significance after any required secondary mitigation and proposed monitoring.

Table 13-35 Summary of Assessment of Effects on commercial fisheries

Effect	Receptor	Magnitude of Impact	Receptor Sensitivity	Effect Significance	Secondary Mitigation	Residual Effect	Proposed Monitoring
Construction							
Reduction in access to, or exclusion from established fishing grounds within the array area	UK demersal otter trawl	High	High	Major	FMMS, adaptation fund, Obstacle Free Zone	Minor	Pre, during and post-construction fisheries activity monitoring
	UK demersal seine	Medium	High	Moderate		Minor	
	UK pelagic otter trawl and purse seine	High	High	Major		Minor	
	Non-UK pelagic otter trawl and purse seine	High	Low	Minor	N/A	Minor	
	UK scallop dredge	Medium	High	Moderate	FMMS, adaptation fund, Obstacle Free Zone	Minor	
	UK potting	Low	High	Minor	N/A	Minor	
	UK gear with hooks	Negligible	High	Negligible	N/A	Negligible	
Reduction in access to, or exclusion from established fishing grounds within the ECC	UK demersal otter trawl	Medium	Medium	Moderate	FMMS, adaptation fund	Minor	Pre, during and post-construction fisheries activity monitoring
	UK demersal seine	Medium	Medium	Moderate		Minor	
	UK pelagic otter trawl and purse seine	Low	Low	Minor	N/A	Minor	
	Non-UK pelagic otter trawl and purse seine	Low	Low	Minor	N/A	Minor	
	UK scallop dredge	Medium	Medium	Moderate	FMMS, adaptation fund	Minor	
	UK potting	Medium	Medium	Moderate		Minor	
	UK gear with hooks	Low	Low	Minor	N/A	Minor	
Displacement leading to gear conflict and increased fishing pressure on adjacent grounds	UK demersal otter trawl	Medium	Medium	Moderate	FMMS, adaptation fund, Obstacle Free Zone	Minor	Pre, during and post-construction fisheries activity monitoring
	UK demersal seine	Medium	Medium	Moderate		Minor	
	UK pelagic otter trawl and purse seine	Low	Medium	Minor	N/A	Minor	
	Non-UK pelagic otter trawl and purse seine	Low	Low	Minor	N/A	Minor	
	UK scallop dredge	Medium	Medium	Moderate	FMMS, adaptation fund, Obstacle Free Zone	Minor	
	UK potting	Medium	Medium	Moderate		Minor	
	UK gear with hooks	Low	Medium	Minor	N/A	Minor	
Disturbance of commercially important fish and shellfish resources leading to displacement or disruption of fishing activity	UK demersal otter trawl	Low	Medium	Minor	N/A	Minor	N/A
	UK demersal seine	Low	Medium	Minor	N/A	Minor	
	UK pelagic otter trawl and purse seine	Medium	Medium	Moderate	Preliminary Piling and Sediment Mitigation Plan	Minor	
	Non-UK pelagic otter trawl and purse seine	Medium	Medium	Moderate		Minor	
	UK scallop dredge	Low	Medium	Minor	N/A	Minor	
	UK potting	Low	Medium	Minor	N/A	Minor	
	UK gear with hooks	Low	Medium	Minor	N/A	Minor	
Increased vessel traffic associated with the Proposed Development within fishing grounds leading to interference with fishing activity	UK demersal otter trawl	Low	Low	Minor	N/A	Minor	N/A
	UK demersal seine	Low	Low	Minor	N/A	Minor	
	UK pelagic otter trawl and purse seine	Low	Low	Minor	N/A	Minor	
	Non-UK pelagic otter trawl and purse seine	Low	Low	Minor	N/A	Minor	
	UK scallop dredge	Low	Low	Minor	N/A	Minor	
	UK potting	Low	Low	Minor	N/A	Minor	
	UK gear with hooks	Low	Low	Minor	N/A	Minor	

Effect	Receptor	Magnitude of Impact	Receptor Sensitivity	Effect Significance	Secondary Mitigation	Residual Effect	Proposed Monitoring
Additional steaming to alternative fishing grounds for vessels that would otherwise fish within the Proposed Development	UK demersal otter trawl	Medium	Medium	Moderate	FMMS, adaptation fund, Obstacle Free Zone	Minor	N/A
	UK demersal seine	Low	Medium	Minor	N/A	Minor	
	UK pelagic otter trawl and purse seine	Low	Low	Minor	N/A	Minor	
	Non-UK pelagic otter trawl and purse seine	Low	Low	Minor	N/A	Minor	
	UK scallop dredge	Low	Medium	Minor	N/A	Minor	
	UK potting	Low	Medium	Minor	N/A	Minor	
	UK gear with hooks	Low	Medium	Minor	N/A	Minor	
Increased snagging risk, which could result in loss or damage to fishing gear	UK demersal otter trawl	Low	Medium	Minor	N/A	Minor	N/A
	UK demersal seine	Low	Medium	Minor	N/A	Minor	
	UK pelagic otter trawl and purse seine	Low	Medium	Minor	N/A	Minor	
	Non-UK pelagic otter trawl and purse seine	Low	Medium	Minor	N/A	Minor	
	UK scallop dredge	Low	Medium	Minor	N/A	Minor	
	UK potting	Low	Low	Minor	N/A	Minor	
	UK gear with hooks	Low	Low	Minor	N/A	Minor	
Operation and Maintenance							
Reduction in access to, or exclusion from established fishing grounds within the array area	UK demersal otter trawl	High	High	Major	FMMS, Fisheries Fund, Obstacle Free Zone	Moderate	Post-construction fisheries activity monitoring
	UK demersal seine	Medium	High	Moderate		Minor	
	UK pelagic otter trawl and purse seine	High	High	Major		Moderate	
	Non-UK pelagic otter trawl and purse seine	High	Low	Minor	N/A	Minor	
	UK scallop dredge	Medium	High	Moderate	FMMS, Fisheries Fund, Obstacle Free Zone	Minor	
	UK potting	Low	High	Minor	N/A	Minor	
	UK gear with hooks	Negligible	High	Negligible	N/A	Negligible	
Reduction in access to, or exclusion from established fishing grounds within the ECC	UK demersal otter trawl	Low	Medium	Minor	N/A	Minor	Post-construction fisheries activity monitoring
	UK demersal seine	Low	Medium	Minor	N/A	Minor	
	UK pelagic otter trawl and purse seine	Low	Low	Minor	N/A	Minor	
	Non-UK pelagic otter trawl and purse seine	Low	Low	Minor	N/A	Minor	
	UK scallop dredge	Low	Medium	Minor	N/A	Minor	
	UK potting	Low	Medium	Minor	N/A	Minor	
	UK gear with hooks	Low	Low	Minor	N/A	Minor	
Displacement leading to gear conflict and increased fishing pressure on adjacent grounds	UK demersal otter trawl	Medium	Medium	Moderate	FMMS, Fisheries Fund, Obstacle Free Zone	Minor	Post-construction fisheries activity monitoring
	UK demersal seine	Low	Medium	Minor	N/A	Minor	
	UK pelagic otter trawl and purse seine	Low	Medium	Minor	N/A	Minor	
	Non-UK pelagic otter trawl and purse seine	Low	Low	Minor	N/A	Minor	
	UK scallop dredge	Low	Medium	Minor	N/A	Minor	

Effect	Receptor	Magnitude of Impact	Receptor Sensitivity	Effect Significance	Secondary Mitigation	Residual Effect	Proposed Monitoring
	UK potting	Low	Medium	Minor	N/A	Minor	
	UK gear with hooks	Low	Medium	Minor	N/A	Minor	
Disturbance of commercially important fish and shellfish resources leading to displacement or disruption of fishing activity	UK demersal otter trawl	Low	Medium	Minor	N/A	Minor	N/A
	UK demersal seine	Low	Medium	Minor	N/A	Minor	
	UK pelagic otter trawl and purse seine	Low	Medium	Minor	N/A	Minor	
	Non-UK pelagic otter trawl and purse seine	Low	Medium	Minor	N/A	Minor	
	UK scallop dredge	Low	Medium	Minor	N/A	Minor	
	UK potting	Low	Medium	Minor	N/A	Minor	
	UK gear with hooks	Low	Medium	Minor	N/A	Minor	
Increased vessel traffic associated with the Proposed Development within fishing grounds leading to interference with fishing activity	UK demersal otter trawl	Low	Low	Minor	N/A	Minor	N/A
	UK demersal seine	Low	Low	Minor	N/A	Minor	
	UK pelagic otter trawl and purse seine	Low	Low	Minor	N/A	Minor	
	Non-UK pelagic otter trawl and purse seine	Low	Low	Minor	N/A	Minor	
	UK scallop dredge	Low	Low	Minor	N/A	Minor	
	UK potting	Low	Low	Minor	N/A	Minor	
	UK gear with hooks	Low	Low	Minor	N/A	Minor	
Additional steaming to alternative fishing grounds for vessels that would otherwise fish within the Proposed Development	UK demersal otter trawl	Medium	Medium	Moderate	FMMS, Fisheries Fund, Obstacle Free Zone	Minor	N/A
	UK demersal seine	Low	Medium	Minor	N/A	Minor	
	UK pelagic otter trawl and purse seine	Low	Low	Minor	N/A	Minor	
	Non-UK pelagic otter trawl and purse seine	Low	Low	Minor	N/A	Minor	
	UK scallop dredge	Low	Medium	Minor	N/A	Minor	
	UK potting	Low	Medium	Minor	N/A	Minor	
	UK gear with hooks	Low	Medium	Minor	N/A	Minor	
Increased snagging risk, which could result in loss or damage to fishing gear	UK demersal otter trawl	Low	Medium	Minor	N/A	Minor	N/A
	UK demersal seine	Low	Medium	Minor	N/A	Minor	
	UK pelagic otter trawl and purse seine	Low	Medium	Minor	N/A	Minor	
	Non-UK pelagic otter trawl and purse seine	Low	Medium	Minor	N/A	Minor	
	UK scallop dredge	Low	Medium	Minor	N/A	Minor	
	UK potting	Low	Low	Minor	N/A	Minor	
	UK gear with hooks	Low	Low	Minor	N/A	Minor	
Decommissioning							
Reduction in access to, or exclusion from established fishing	UK demersal otter trawl	High	High	Major	FMMS, adaptation fund, Obstacle Free Zone	Minor	N/A
	UK demersal seine	Medium	High	Moderate		Minor	
	UK pelagic otter trawl and purse seine	High	High	Major		Minor	

Effect	Receptor	Magnitude of Impact	Receptor Sensitivity	Effect Significance	Secondary Mitigation	Residual Effect	Proposed Monitoring
grounds within the array area	Non-UK pelagic otter trawl and purse seine	High	Low	Minor	N/A	Minor	
	UK scallop dredge	Medium	High	Moderate	FMMS, adaptation fund, Obstacle Free Zone	Minor	
	UK potting	Low	High	Minor	N/A	Minor	
	UK gear with hooks	Negligible	High	Negligible	N/A	Negligible	
Reduction in access to, or exclusion from established fishing grounds within the ECC	UK demersal otter trawl	Medium	Medium	Moderate	FMMS, adaptation fund	Minor	N/A
	UK demersal seine	Medium	Medium	Moderate		Minor	
	UK pelagic otter trawl and purse seine	Low	Low	Minor	N/A	Minor	
	Non-UK pelagic otter trawl and purse seine	Low	Low	Minor	N/A	Minor	
	UK scallop dredge	Medium	Medium	Moderate	FMMS, adaptation fund	Minor	
	UK potting	Medium	Medium	Moderate		Minor	
	UK gear with hooks	Low	Low	Minor	N/A	Minor	
Displacement leading to gear conflict and increased fishing pressure on adjacent grounds	UK demersal otter trawl	Medium	Medium	Moderate	FMMS, adaptation fund, Obstacle Free Zone	Minor	N/A
	UK demersal seine	Medium	Medium	Moderate		Minor	
	UK pelagic otter trawl and purse seine	Low	Medium	Minor	N/A	Minor	
	Non-UK pelagic otter trawl and purse seine	Low	Low	Minor	N/A	Minor	
	UK scallop dredge	Medium	Medium	Moderate	FMMS, adaptation fund, Obstacle Free Zone	Minor	
	UK potting	Medium	Medium	Moderate		Minor	
	UK gear with hooks	Low	Medium	Minor	N/A	Minor	
Disturbance of commercially important fish and shellfish resources leading to displacement or disruption of fishing activity	UK demersal otter trawl	Low	Medium	Minor	N/A	Minor	N/A
	UK demersal seine	Low	Medium	Minor	N/A	Minor	
	UK pelagic otter trawl and purse seine	Medium	Medium	Moderate	Preliminary Piling and Sediment Mitigation Plan	Minor	
	Non-UK pelagic otter trawl and purse seine	Medium	Medium	Moderate		Minor	
	UK scallop dredge	Low	Medium	Minor	N/A	Minor	
	UK potting	Low	Medium	Minor	N/A	Minor	
	UK gear with hooks	Low	Medium	Minor	N/A	Minor	
Increased vessel traffic associated with the Proposed Development within fishing grounds leading to interference with fishing activity	UK demersal otter trawl	Low	Low	Minor	N/A	Minor	N/A
	UK demersal seine	Low	Low	Minor	N/A	Minor	
	UK pelagic otter trawl and purse seine	Low	Low	Minor	N/A	Minor	
	Non-UK pelagic otter trawl and purse seine	Low	Low	Minor	N/A	Minor	
	UK scallop dredge	Low	Low	Minor	N/A	Minor	
	UK potting	Low	Low	Minor	N/A	Minor	
	UK gear with hooks	Low	Low	Minor	N/A	Minor	
Additional steaming to alternative fishing grounds for vessels that would otherwise fish within the Proposed Development	UK demersal otter trawl	Medium	Medium	Moderate	FMMS, adaptation fund, Obstacle Free Zone	Minor	N/A
	Uk demersal seine	Low	Medium	Minor	N/A	Minor	
	UK pelagic otter trawl and purse seine	Low	Low	Minor	N/A	Minor	
	Non-UK pelagic otter trawl and purse seine	Low	Low	Minor	N/A	Minor	

Effect	Receptor	Magnitude of Impact	Receptor Sensitivity	Effect Significance	Secondary Mitigation	Residual Effect	Proposed Monitoring
	UK scallop dredge	Low	Medium	Minor	N/A	Minor	
	UK potting	Low	Medium	Minor	N/A	Minor	
	UK gear with hooks	Low	Medium	Minor	N/A	Minor	
Increased snagging risk, which could result in loss or damage to fishing gear	UK demersal otter trawl	Low	Medium	Minor	N/A	Minor	N/A
	UK demersal seine	Low	Medium	Minor	N/A	Minor	
	UK pelagic otter trawl and purse seine	Low	Medium	Minor	N/A	Minor	
	Non-UK pelagic otter trawl and purse seine	Low	Medium	Minor	N/A	Minor	
	UK scallop dredge	Low	Medium	Minor	N/A	Minor	
	UK potting	Low	Low	Minor	N/A	Minor	
	UK gear with hooks	Low	Low	Minor	N/A	Minor	

Table 13-36 Summary of Assessment of Cumulative Effects on Commercial Fisheries

Effect	CEA Tier	Receptor	Magnitude of Cumulative Impact	Receptor Sensitivity	Cumulative Effect Significance	Secondary Mitigation	Residual Cumulative Effect	Proposed Monitoring
All phases								
Reduction in access to, or exclusion from established fishing grounds	1	UK demersal otter trawl	Low	Medium	Minor	None beyond Proposed Development mitigation	Minor	None beyond monitoring proposed for Commercial Fisheries Regional Study Area
	1	UK demersal seine	Low	Medium	Minor		Minor	
	1	UK pelagic otter trawl and purse seine	Low	Medium	Minor		Minor	
	1	Non-UK pelagic otter trawl and purse seine	Low	Medium	Minor		Minor	
	1	UK scallop dredge	Low	Medium	Minor		Minor	
	1	UK potting	Low	Medium	Minor		Minor	
	1	UK gear with hooks	Low	Medium	Minor		Minor	
	2	UK demersal otter trawl	Medium	Medium	Moderate		Moderate	
	2	UK demersal seine	Medium	Medium	Moderate		Moderate	
	2	UK pelagic otter trawl and purse seine	Medium	Medium	Moderate		Moderate	
	2	Non-UK pelagic otter trawl and purse seine	Medium	Medium	Moderate		Moderate	
	2	UK scallop dredge	Medium	Medium	Moderate		Moderate	
	2	UK potting	Low	Medium	Minor		Minor	
	2	UK gear with hooks	Low	Medium	Minor		Minor	
	3	UK demersal otter trawl	Medium	Medium	Moderate		Moderate	
	3	UK demersal seine	Medium	Medium	Moderate		Moderate	
	3	UK pelagic otter trawl and purse seine	Medium	Medium	Moderate		Moderate	
	3	Non-UK pelagic otter trawl and purse seine	Medium	Medium	Moderate		Moderate	
	3	UK scallop dredge	Medium	Medium	Moderate		Moderate	

Effect	CEA Tier	Receptor	Magnitude of Cumulative Impact	Receptor Sensitivity	Cumulative Effect Significance	Secondary Mitigation	Residual Cumulative Effect	Proposed Monitoring
	3	UK potting	Low	Medium	Minor		Minor	
	3	UK gear with hooks	Low	Medium	Minor		Minor	
Displacement leading to gear conflict and increased fishing pressure on adjacent grounds	1	UK demersal otter trawl	Low	Medium	Minor	None beyond Proposed Development mitigation	Minor	None beyond monitoring proposed for Commercial Fisheries Regional Study Area
	1	UK demersal seine	Low	Medium	Minor		Minor	
	1	UK pelagic otter trawl and purse seine	Low	Medium	Minor		Minor	
	1	Non-UK pelagic otter trawl and purse seine	Low	Medium	Minor		Minor	
	1	UK scallop dredge	Low	Medium	Minor		Minor	
	1	UK potting	Low	Medium	Minor		Minor	
	1	UK gear with hooks	Low	Medium	Minor		Minor	
	2	UK demersal otter trawl	Medium	Medium	Moderate		Moderate	
	2	UK demersal seine	Medium	Medium	Moderate		Moderate	
	2	UK pelagic otter trawl and purse seine	Medium	Medium	Moderate		Moderate	
	2	Non-UK pelagic otter trawl and purse seine	Medium	Medium	Moderate		Moderate	
	2	UK scallop dredge	Medium	Medium	Moderate		Moderate	
	2	UK potting	Medium	Medium	Moderate		Moderate	
	2	UK gear with hooks	Medium	Medium	Moderate		Moderate	
	3	UK demersal otter trawl	Medium	Medium	Moderate		Moderate	
	3	UK demersal seine	Medium	Medium	Moderate		Moderate	
	3	UK pelagic otter trawl and purse seine	Medium	Medium	Moderate		Moderate	
	3	Non-UK pelagic otter trawl and purse seine	Medium	Medium	Moderate		Moderate	
	3	UK scallop dredge	Medium	Medium	Moderate		Moderate	
	3	UK potting	Medium	Medium	Moderate		Moderate	
	3	UK gear with hooks	Medium	Medium	Moderate		Moderate	
Disturbance of commercially important fish and shellfish resources leading to displacement or disruption of fishing activity	1	UK demersal otter trawl	Low	Medium	Minor	None beyond Proposed Development mitigation	Minor	None beyond monitoring proposed for Commercial Fisheries Regional Study Area
	1	UK demersal seine	Low	Medium	Minor		Minor	
	1	UK pelagic otter trawl and purse seine	Low	Medium	Minor		Minor	
	1	Non-UK pelagic otter trawl and purse seine	Low	Medium	Minor		Minor	
	1	UK scallop dredge	Low	Medium	Minor		Minor	
	1	UK potting	Low	Medium	Minor		Minor	
	1	UK gear with hooks	Low	Medium	Minor		Minor	
	2	UK demersal otter trawl	Low	Medium	Minor		Minor	
	2	UK demersal seine	Low	Medium	Minor		Minor	
	2	UK pelagic otter trawl and	Low	Medium	Minor		Minor	

Effect	CEA Tier	Receptor	Magnitude of Cumulative Impact	Receptor Sensitivity	Cumulative Effect Significance	Secondary Mitigation	Residual Cumulative Effect	Proposed Monitoring
		purse seine						
	2	Non-UK pelagic otter trawl and purse seine	Low	Medium	Minor		Minor	
	2	UK scallop dredge	Low	Medium	Minor		Minor	
	2	UK potting	Low	Medium	Minor		Minor	
	2	UK gear with hooks	Low	Medium	Minor		Minor	
	3	UK demersal otter trawl	Low	Medium	Minor		Minor	
	3	UK demersal seine	Low	Medium	Minor		Minor	
	3	UK pelagic otter trawl and purse seine	Low	Medium	Minor		Minor	
	3	Non-UK pelagic otter trawl and purse seine	Low	Medium	Minor		Minor	
	3	UK scallop dredge	Low	Medium	Minor		Minor	
	3	UK potting	Low	Medium	Minor		Minor	
	3	UK gear with hooks	Low	Medium	Minor		Minor	

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