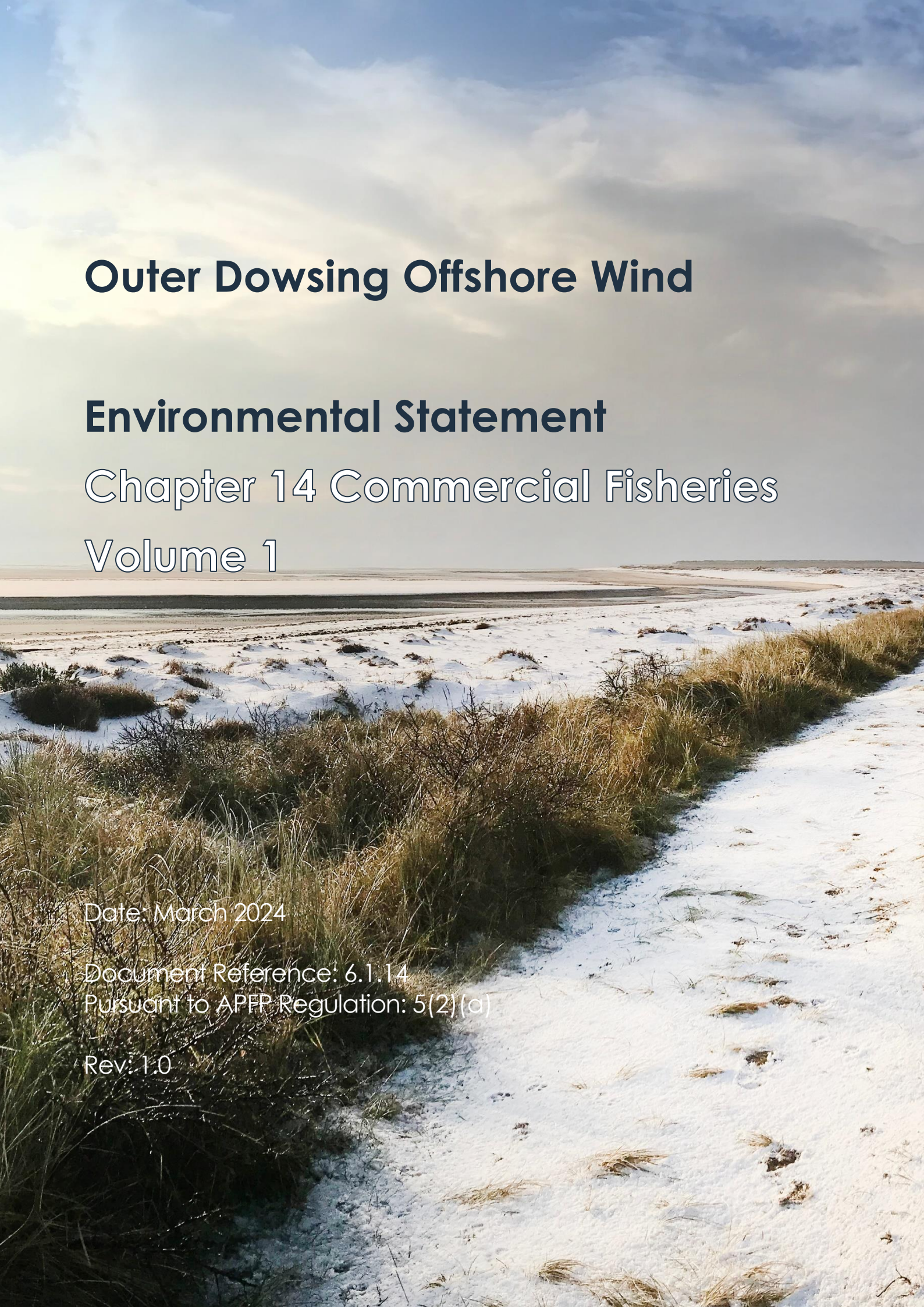

Outer Dowsing Offshore Wind

Environmental Statement

Chapter 14 Commercial Fisheries

Volume 1

Date: March 2024

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Rev No.	Date	Status / Reason for Issue	Author	Checked by	Reviewed by	Approved by
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Acronyms & Terminology

Abbreviations / Acronyms

Abbreviation / Acronym	Description
AIS	Automatic Identification System
ANS	Artificial Nesting Structure
BEIS	Department for Business, Energy & Industrial Strategy (now the Department for Energy Security and Net Zero (DESNZ))
CEA	Cumulative Effects Assessment
Cefas	Centre for Environment, Fisheries and Aquaculture Science
DCF	Data Collection Framework
DCO	Development Consent Order
DECC	Department of Energy & Climate Change, now Department for Energy Security and Net Zero (DESNZ)
DESNZ	Department for Energy Security and Net Zero, formerly Department of Business, Energy and Industrial Strategy (BEIS), which was previously Department of Energy & Climate Change (DECC)
ECC	Export Cable Corridor
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
EMF	Electro-magnetic Field
ES	Environmental Statement
ESCA	European Subsea Cables Association
EU	European Union
FLCP	Fisheries Liaison and Coexistence Plan
FLO	Fisheries Liaison Officer
FLOWW	Fishing Liaison with Offshore Wind and Wet Renewables
GIG	Green Investment Group
GIS	Geographic Information System
GPS	Global Positioning System
GT R4 Limited	The Applicant. The special project vehicle created in partnership between Corio Generation (a wholly owned Green Investment Group portfolio company), Gulf Energy Development and TotalEnergies
ICES	International Council for the Exploration of the Sea
IFCA	Inshore Fisheries and Conservation Authority
IPC	Infrastructure Planning Commission
JUV	Jack Up Vessel
MCA	Maritime and Coastguard Agency
MDS	Maximum Design Scenario
MHWS	Mean High Water Springs
MMO	Marine Management Organisation
MPS	Marine Policy Statement
NFFO	National Federation of Fishermen's Organisations
NPS	National Policy Statement
NRA	Navigational Risk Assessment
NSIP	Nationally Significant Infrastructure Projects
NtM	Notice to Mariners

Abbreviation / Acronym	Description
ODOW	Outer Dowsing Offshore Wind (The Project)
ORCP	Offshore Reactive Compensation Platform
OSS	Offshore Substation
PEIR	Preliminary Environmental Information Report
SSC	Suspended Sediment Concentration
TAC	Total Allowable Catch
TCA	Trade and Cooperation Agreement
The Planning Inspectorate	The Planning Inspectorate
UK	United Kingdom
UKFEN	UK Fisheries Economic Network
VMS	Vessel Monitoring System

Terminology

Term	Definition
The Applicant	GT R4 Ltd. The Applicant making the application for a DCO. The Applicant is GT R4 Limited (a joint venture between Corio Generation, TotalEnergies and Gulf Energy Development (GULF)), trading as Outer Dowsing Offshore Wind. The Project is being developed by Corio Generation (a wholly owned Green Investment Group portfolio company), TotalEnergies and GULF.
Array area	The area offshore within which the generating station (including wind turbine generators (WTG) and inter array cables), offshore accommodation platforms, offshore transformer substations and associated cabling will be positioned.
Beam trawl	A method of bottom trawling with a net that is held open by a beam, which is generally a heavy steel tube supported by steel trawl heads at each end. Tickler chains or chain mats, attached between the beam and the ground rope of the net, are used to disturb fish and crustaceans that rise up and fall back into the attached net.
Bycatch	Catch which is retained and sold but is not the target species for the fishery.
Demersal	Living on or near the seabed.
Development Consent Order (DCO)	An order made under the Planning Act 2008 granting development consent for a Nationally Significant Infrastructure Project (NSIP).
Displacement	Displacement of fishing activity refers to the relocation of fishing activity (i.e., pressure or effort) from an area into other area(s) as a result of the presence of other licensed marine activities and/or associated infrastructure.
Environmental Impact Assessment (EIA)	A statutory process by which certain planned projects must be assessed before a formal decision to proceed can be made. It involves the collection and consideration of environmental information, which fulfils the assessment requirements of the Environmental Impact Assessment (EIA) Regulations, including the publication of an Environmental Statement (ES).
Fish stock	Any natural population of fish which is 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.
Fishing mortality	Mortality due to fishing; death or removal of fish from a population due to fishing.

Term	Definition
Fleet	A physical group of vessels sharing similar characteristics (e.g., nationality).
Gear type	The method / equipment used for fishing.
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.
Landings	Quantitative description of the amount of fish returned to port for sale, in terms of value or weight.
Maximum Sustainable Yield	Maximum sustainable yield (MSY) is the largest yield (catch, in tonnes) that can be taken from a specific fish stock over an indefinite period under constant environmental conditions. Fishing at MSY levels should ensure the capacity of the stock to continue to produce this level in the long-term.
Metier	A homogenous subdivision, either of a fishery by vessel type or a fleet by voyage type.
Minimum Landing Size (MLS)	A technical measure that limits the size of fish or shellfish species that can be legally landed and sold. The MLS varies per species. With the implementation of the Landings Obligation, the existing MLS are changed into minimum conservation reference sizes (MCRS), but they will remain largely the same.
Mobile (fishing gear)	Fishing gear that is moved through the water to catch fish and shellfish. Examples include trawls and towed dredges.
Offshore Export Cable Corridor (ECC)	The Offshore Export Cable Corridor (Offshore ECC) is the area within the Order Limits within which the export cables running from the array to landfall will be situated.
Otter trawl	A net with large rectangular boards (otter boards) 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.
Preliminary Environmental Information Report (PEIR)	The PEIR was written in the style of a draft Environmental Statement (ES) and provided information to support and inform the statutory consultation process during the pre-application phase.
Project Design Envelope	A description of the range of possible elements that make up the Project's design options under consideration, as set out in detail in the project description. This envelope is used to define the Project for Environmental Impact Assessment (EIA) purposes when the exact engineering parameters are not yet known. This is also often referred to as the "Rochdale Envelope" approach.
Pelagic	Of or relating to the open sea.
Pelagic trawl	A net used to target fish species in the mid water column.
Receptor	A distinct part of the environment on which effects could occur and can be the subject of specific assessments. Examples of receptors include species (or groups) of animals or plants, people (often categorised further such as 'residential' or those using areas for amenity or recreation), watercourses etc.
Quota	A proportion of the Total Allowable Catch for a fish stock.
Recruitment	Recruitment can be defined as the number of fish surviving to enter the fishery or to some life history stage such as settlement or maturity.

Term	Definition
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.
Spawning	The act of releasing or depositing eggs (fish).
Spawning stock biomass	The combined weight (in tonnes) of all the fish of one specific stock that are old enough to spawn. It provides an indication of the status of the stock and the reproductive capacity of the stock.
Static (fishing gear)	Fishing gear that is set in the water to wait for fish or shellfish to swim into it or be attracted to it. Examples include pots and traps, and fixed nets.
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.
String	A series of static fishing gear (pots) joined together to form a single deployable linear line of pots.
Subsea	Subsea comprises everything existing or occurring below the surface of the sea.
Swept Area Ratio (SAR)	Swept Area Ratio indicates the number of times in an annual period that a fishing gear makes contact with (or sweeps) the seabed surface. SAR provides a proxy for fishing intensity.
The Project	Outer Dowsing Offshore Wind including proposed onshore and offshore infrastructure.
Total Allowable Catch (TAC)	TACs are catch limits, expressed in tonnes or numbers, that are set for some commercial fish stocks.
Vessel Monitoring System (VMS)	A system 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.

Reference Documentation

Document Number	Title
6.1.10	Fish and Shellfish Ecology
6.1.15	Shipping and Navigation
6.1.18	Marine Infrastructure and Other Users
6.1.2	Need, Policy and Legislative Context
6.1.3	Project Description
6.1.4	Site Selection and Assessment of Alternatives
6.1.5	EIA Methodology
6.3.5.1	Navigational Risk Assessment
8.22	Fisheries Liaison and Coexistence Plan
8.5	Outline Cable Specification and Installation Plan

14 Commercial Fisheries

14.1 Introduction

1. This chapter of the Environmental Statement (ES) presents the results of the Environmental Impact Assessment (EIA) process for the potential impacts of Outer Dowsing Offshore Wind ("the Project") on commercial fisheries. Specifically, this chapter considers the potential impact of the Project seaward of Mean High Water Springs (MHWS) during the construction, operation and maintenance, and decommissioning phases.
2. GT R4 Limited (trading as Outer Dowsing Offshore Wind) hereafter referred to as the 'Applicant', is proposing to develop the Project. The Project array area will be located approximately 54km from the Lincolnshire coastline in the southern North Sea. The Project will include both offshore and onshore infrastructure including an offshore generating station (windfarm), export cables to landfall, Offshore Reactive Compensation Platforms (ORCPs), onshore cables, connection to the electricity transmission network, ancillary and associated development and areas for the delivery of up to two Artificial Nesting Structures (ANS) and the creation of a biogenic reef (if these compensation measures are deemed to be required by the Secretary of State) (see Volume 1, Chapter 3: Project Description (document reference 6.1.3) for full details).
3. This chapter should be read in conjunction with the Volume 3, Appendix 14.1: Commercial Fisheries Baseline Technical Report (Document reference 6.3.14.1).
4. This has been informed by the following ES chapters:
   - Volume 1, Chapter 10: Fish and Shellfish Ecology (Document Reference 6.1.10) where impacts on the ecology of fish and shellfish, including species of commercial interest, are assessed; and
   - Volume 1, Chapter 15: Shipping and Navigation (Document Reference 6.1.15) where impacts on the navigational safety aspects of fishing activity are assessed.
5. This chapter considers commercial fisheries activity, which is understood as fishing activity legally undertaken where the catch is sold for taxable profit. Potential impacts of the Project on charter angling, defined as fishing for marine species where the purpose is recreation and not sale or trade, are assessed in Volume 1, Chapter 18: Marine Infrastructure and Other Users (Document Reference 6.1.18).

14.2 Statutory and Policy Context

6. This section identifies the legislation, policy and other documentation that has informed the assessment of effects with respect to commercial fisheries. Further information on legislation and policies relevant to the EIA and their status is provided in Volume 1, Chapter 2 (Document Reference 6.1.2): Need, Policy and Legislative Context.

7. This document has been prepared in accordance with the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (EIA Regulations 2017), of relevance to Nationally Significant Infrastructure Projects (NSIPs).

14.2.1 National Planning Policy

8. The assessment of potential impacts on commercial fisheries has been made with specific reference to the relevant National Policy Statements (NPS). These are the principal decision-making documents for NSIPs. Those relevant to the Project, and which came into force in January 2024, are:
   - Overarching NPS for Energy (EN-1) (Department for Energy Security and Net Zero (DESNZ), 2023a); and
   - NPS for Renewable Energy Infrastructure (EN-3) (DESNZ, 2023b).
9. The specific assessment requirements for commercial fisheries, as detailed in the NPS, are summarised in Table 14.1 together with an indication of the section of the ES chapter where each is addressed.

14.2.2 Other Relevant Policies

10. The UK Marine Policy Statement (MPS; HM Government 2011) explicitly expresses support for the fishing sector, and advocates that wherever possible, decision makers should "seek to encourage opportunities for co-existence between fishing and other activities", noting that "many fishing activities are compatible with other sea users".
11. The East Inshore and East Offshore Marine Plans (Defra, 2014) support fishing activity by avoiding adverse impacts resulting from development and activities; the relevant policies specifically focus on access to fishing grounds. A summary of regional Marine Plan policies relevant to commercial fisheries is provided in Table 14.1.

Table 14.1: Legislation and policy context

Legislation/policy	Key provisions	Section where comment addressed
National Policy Statement for Renewable Energy Infrastructure (EN-3) (DESNZ, 2023b)	"Applicants should consider guidance on best practice for fisheries liaison, which has been jointly agreed by the renewables industry and fishing community." (paragraph 2.8.159 of NPS EN-3)	The commercial fisheries impact assessment takes account of relevant guidance, as confirmed below this table, in Section 14.2.
NPS EN-3	"In some circumstances, transboundary issues may be a consideration as fishing vessels from other coastal States may fish in waters within which offshore wind farms are sited. Applicants should seek advice from Defra in such circumstances." (paragraph 2.8.160 of NPS EN-3)	Potential transboundary effects are considered in Section 14.10.

Legislation/policy	Key provisions	Section where comment addressed
NPS EN-3	"Applicants should undertake early consultation with a cross-section of the fishing industry, as well as MMO, SNCBs, Defra and Welsh Government, to identify impacts, and actively encourage input from active fishermen to provide evidence of their use of the area to support the impact assessments." (paragraph 2.8.154 of NPS EN-3)	Consultation with representatives of the fishing industry, MMO, EIFCA and other relevant parties has commenced and is ongoing. Engagement is summarised in Section 14.3.
NPS EN-3	"Where any part of a proposal involves a grid connection to shore, appropriate inshore fisheries groups should also be consulted." (paragraph 3.8.155 of NPS EN-3)	Consultation with representatives of the fishing industry and EIFCA has commenced and is ongoing. Engagement is summarised in Section 14.3.
NPS EN-3	"Applicants will be expected to undertake dialogue with the fishing industry during the planning and design of individual offshore windfarm proposals to maximise the potential for co-existence/co-location and reduce potential displacement." (paragraph 2.8.158 of NPS EN-3)	Consultation with representatives of the fishing industry has commenced and is ongoing. Engagement is summarised in Section 14.3.
NPS EN-3	"Applicant assessments should include robust baseline data and detailed surveys of the effects on fish stocks of commercial interest and any potential reduction in such stocks, as well as any likely constraints on fishing activity within the project's boundaries." (paragraph 2.8.157 of NPS EN-3)	Relevant surveys and data are detailed in Chapter 10 Fish and Shellfish Ecology (Document Reference 6.1.10). The Project assessment has considered the effects on commercial fish stocks (see Chapter 10 (Document Reference 6.1.10)).
NPS EN-3	"In some circumstances, applicants may seek declaration of safety zones around wind turbines and other infrastructure. Although these might not be applied until after consent to the windfarm has been granted. The declaration of a safety zone excludes or restricts activities within the defined sea areas including commercial fishing. Where there is a possibility that safety zones will be sought applicant	The Applicant will apply for safety zones post-consent. Safety zones of up to 500m will be sought during construction, maintenance and decommissioning phases, as described in both the maximum design scenario and embedded mitigation measures presented in Section 14.5.

Legislation/policy	Key provisions	Section where comment addressed
	assessments should include potential effects on commercial fishing. Where the precise extents of potential safety zones are unknown, a realistic worst-case scenario should be assessed. Applicants should consult the Maritime and Coastguard Agency (MCA) as part of this process." (paragraph 2.8.160 to 2.8.164 of NPS EN-3)	The need for safety zones has been considered by the navigational risk assessment (NRA) completed for the Project. The risk assessment results have been taken into account within the commercial fisheries assessment (see Section 14.7). Consultation has also been undertaken with the MCA (see Chapter 15 Shipping and Navigation (Document Reference 6.1.15)).
NPS EN-3	"Any mitigation proposals should result from the applicant having detailed consultation with relevant representatives of the fishing industry, the MMO and the relevant Defra policy team in England and NRW and the relevant Welsh Government policy team in Wales." (paragraph 2.8.250 of NPS EN-3)	A range of commitments are presented within Section 14.5, including development of an Outline Fisheries Liaison and Co-existence Plan (FLCP), which it is intended will be developed in collaboration with the local fishing industry and other relevant parties.
NPS EN-3	"Mitigation should be designed to enhance where reasonably possible any potential medium and long-term positive benefits to the fishing industry, commercial fish stocks and the marine environment." (paragraph 2.8.251 of NPS EN-3)	
NPS EN-3	"The Secretary of State should be satisfied that the site selection process has been undertaken in a way that reasonably minimises adverse effects on fish stocks, including during peak spawning periods and the activity of fishing itself." (paragraph 2.8.318 of NPS EN-3)	The site selection process is fully described in Chapter 4 Site Selection and Assessment of Alternatives (Document Reference 6.1.4). The effects arising from the Project have been and will be discussed with statutory bodies during pre- and post-application consultation. The Applicant is taking steps, and will continue to do so, to minimise the effects upon the fishing industry in the area through

Legislation/policy	Key provisions	Section where comment addressed
		appropriate mitigation where required. Commitments related to commercial fisheries and adopted as part of the Project are provided in Section 14.5; these include a reduction in project design.
NPS EN-3	"The Secretary of State should consider the extent to which the proposed development occupies any recognised important fishing grounds and whether the project would prevent or significantly impede protection of sustainable commercial fisheries or fishing activities." (paragraph 2.8.319 of NPS EN-3)	The extent to which the Project impacts on recognised and important fishing grounds has been considered, and consultation with fishing stakeholders in order to fully understand any potential impacts has been undertaken (see Section 14.3. The results of the commercial fisheries assessment are presented in Section 14.7.
NPS EN-3	"Where the Secretary of State considers the windfarm would significantly impede protection of sustainable fisheries or fishing activity at recognised important fishing grounds, this should be attributed a correspondingly significant weight." (paragraph 2.8.320 of NPS EN-3)	
NPS EN-3	"The Secretary of State should consider adverse or beneficial impacts on different types of commercial fishing on a case-by-case basis." (paragraph 3.8.321 of NPS EN-3)	The assessment outputs presented in this chapter are intended to support this consideration.
NPS EN-3	"The Secretary of State should be satisfied that the applicant has sought to design the proposal having consulted the MMO or NRW in Wales, Defra or Welsh Government in Wales and representatives of the fishing industry with the intention of minimising the loss of fishing opportunity taking into account effects on other marine interests. Guidance has been jointly agreed by the renewables and fishing industries on how they should liaise with the intention of allowing the two industries to successfully co-exist." (paragraph 3.8.322 of NPS EN-3)	Consultation with the MMO and representatives of the fishing industry has commenced and is ongoing. Engagement is summarised in Section 14.3. Existing guidance regarding liaison is noted (Section 14.2) and is being applied by the Applicant.
NPS EN-3	"The Secretary of State will need to consider the extent to which disruption to	The extent to which the Project may cause disruption

Legislation/policy	Key provisions	Section where comment addressed
	the fishing industry, whether short term during preconstruction (e.g. surveying) or construction or long term over the operational period, including that caused by the future implementation of any safety zones, has been mitigated where reasonably possible." (paragraph 2.8.323 of NPS EN-3)	to the fishing industry has been considered and consultation with fishing stakeholders in order to fully understand any potential impacts has been undertaken (see Section 14.3). The results of the commercial fisheries assessment are presented in Section 14.7. A range of commitments to minimise and mitigate adverse impacts are presented within Section 14.5.
NPS EN-3	"Where an offshore windfarm could affect a species of fish that is of commercial interest, but is also of ecological value, the Secretary of State should refer to Section 2.8.147 of this NPS with regard to the latter." (paragraph 2.8.324 of NPS EN-3)	The Project assessment has considered the effects on commercial fish stocks (see Chapter 10 Fish and Shellfish Ecology (Document Reference 6.1.10)).
East Inshore and East Offshore Marine Plans (Defra, 2014)	Policy FISH1 Within areas of fishing activity, proposals should demonstrate in order of preference: a) that they will not prevent fishing activities on, or access to, fishing grounds b) how, if there are adverse impacts on the ability to undertake fishing activities or access to fishing grounds, they will minimise them c) how, if the adverse impacts cannot be minimised, they will be mitigated d) the case for proceeding with their proposal if it is not possible to minimise or mitigate the adverse impacts	The extent to which the Project impacts on recognised and important fishing grounds has been considered and consultation with fishing stakeholders in order to fully understand any potential impacts has been undertaken (see Section 14.3). The results of the commercial fisheries assessment are presented in Section 14.7. A range of commitments to minimise and mitigate are presented within Section 14.5.

14.2.3 Other Relevant Guidance

12. In addition to the above the following documents have been used to inform the assessment of potential impacts of the Project on commercial fisheries. These include:

- Good Practice Guidance for Assessing Fisheries Displacement (Xodus, 2022);
- Best Practice Guidance for Fishing Industry Financial and Economic Impact Assessments (United Kingdom Fisheries Economic Network (UKFEN) 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 BERR, 2008);
- FLOWW Best Practice Guidance for Offshore Renewables Developments: Recommendations for Fisheries Disruption Settlements and Community Funds (FLOWW, 2015);
- Damage to Gear Compensation Claim Forms (Marine Scotland, 2021);
- Guidance on completing Damage to Gear Compensation Claim Forms (Marine Scotland, 2021);
- Options and opportunities for marine fisheries mitigation associated with windfarms (Blyth-Skyrme, 2010a);
- Developing guidance on fisheries Cumulative Impact Assessment for windfarm developers (Blyth-Skyrme, 2010b);
- Cumulative impact assessment guidelines, guiding principles for cumulative impacts assessments in offshore windfarms (RenewableUK, 2013);
- Fishing and Submarine Cables – Working Together (International Cable Protection Committee, 2009);
- Guidance on preparing a Fisheries Management and Mitigation Strategy ("FMMS") (draft) (Marine Scotland, 2020); and
- Planning Inspectorate Scoping Opinion (Planning Inspectorate, 2022) which included scoping responses from statutory consultees.

13. It is noted that at the time of ES preparation FLOWW Best Practice Guidance is intended to be revised with revision currently ongoing. The Application will take into account the existing 2014 and 2015 versions of the guidance cited above noting that revised versions have not yet been published.

14.3 Consultation

14. This section describes the outcome of, and response to, the Scoping Opinion and the Preliminary Environmental Information Report (PEIR) in relation to commercial fisheries assessment and also provides details of the ongoing informal consultation that has been undertaken with stakeholders and individuals.
15. A summary of the key issues raised during consultation to date, specific to commercial fisheries, is outlined in Table 14.2 below, together with how these issues have been considered in the production of this ES.

16. The Applicant submitted a Scoping Report and request for a Scoping Opinion in July 2022. A Scoping Opinion was received in September 2022. The Scoping Report set out the proposed commercial fisheries assessment methodologies, an outline of the baseline data collected to date and proposed, and the scope of the assessment. Table 14.2 sets out the comments received in Section 3.8 of The Planning Inspectorate's (The Planning Inspectorate) Scoping Opinion and how these have been addressed in this ES.
17. The Applicant commenced Section 42 (S42) consultation on the PEIR - the first main output of the EIA process - in June 2023. The consultation closed in July 2023. Table 14.2 sets out the comments received in S42 responses relevant to commercial fisheries and how these have been addressed in this ES.
18. Informal engagement has been ongoing with a number of stakeholders in relation to commercial fisheries since March 2021. A summary of the informal engagement undertaken since March 2021 is outlined in this section. A company Fisheries Liaison Officer has been in post since 2021, actively identifying and regularly engaging with fisheries active in the Project area and making regular visits to local fishing ports.

Table 14.2: Summary of consultation relating to commercial fisheries

Date and consultation phase/ type	Consultation and key issues raised	Section where comment addressed
Scoping Opinion		
9 September 2022 Scoping Opinion (The Planning Inspectorate, 2022)	Additional steaming to alternative fishing grounds for vessels that would otherwise fish within the Proposed Development area – The Planning Inspectorate agrees that due to the nature and the low sensitivity of fishing vessels, taking account of their large operational range, a significant effect is unlikely during construction, operation and maintenance and decommissioning, and a detailed assessment in the ES is not required. However, the ES should characterise the operational effects on commercial fisheries including increased steaming times and provide the evidence used to determine that significant effects are unlikely. The ES should also detail the measures proposed to ensure adequate notification is provided.	Noted; potential impact is assessed in Section Table 14.7. Embedded measures relating to notification of planned activity to fisheries stakeholders are presented in Table 14.6.
9 September 2022 Scoping Opinion (The Planning Inspectorate, 2022)	The Planning Inspectorate request that the ES should demonstrate that the Proposed Development does not undermine fisheries byelaws or hinder the implementation of the management measures.	Relevant byelaws are fully described in Section 3.4 of Volume 3, Appendix 14.1: Commercial Fisheries Baseline Technical Report (Document Reference 6.3.14.1) and also in Section 14.4 below.
9 September 2022 Scoping Opinion (The Planning Inspectorate, 2022)	The Planning Inspectorate request that the ES should include an assessment of the effects of cable protection from methods other than burial, based on the worst-case	The maximum design scenario for cable protection is presented in Table 14.5 and this scenario is considered throughout the assessment presented in Section 14.7.

Date and consultation phase/ type	Consultation and key issues raised	Section where comment addressed
	scenario which has been defined for the area of cable protection likely to be required.	
9 September 2022 Scoping Opinion (The Planning Inspectorate, 2022)	The Planning Inspectorate request that the ES should clearly define the duration of 'short-term' and 'localised' impacts.	Assessment criteria are fully defined in Table 14.7 and Table 14.8.
9 September 2022 Scoping Opinion (The Planning Inspectorate, 2022)	Noting that the Scoping Report states that it is assumed fishing can resume to a degree within the array area, The Planning Inspectorate request that the ES should clarify the assumptions made within the assessment, including the extent to which fishing would be permitted to resume within the array area.	Assumptions regarding resumption of fishing are stated in Table 14.5, and further described within the assessment at paragraph 250.
Applicant meetings		
May 2021 to present Applicant and company Fisheries Liaison Officer (FLO) meetings with static gear fishermen operating out of Grimsby (11 vessels), Bridlington (7 vessels), Skegness (1 vessel), Kings Lynn (1 vessel) and Wells-next-to-the-Sea (2 vessels)	Initial meetings focused on introduction of the Project to stakeholders and discussion in relation to planned geophysical survey in the Project area. Meeting attendees shared information on fishing grounds and patterns. Regular company FLO-led engagement is ongoing, providing fishers with Project updates and gathering information on current fishing activity in the Project area.	Information provided to the Applicant on fishing activity in and around the Project has been considered in the preparation of Volume 3, Appendix 14.1 (Document Reference 6.3.14.1).
February 2022 Applicant meeting with the Holderness Fishing Industry Group (HFIG)	Introduction of the Project to HFIG. Discussion of opportunities for HFIG in relation to the Project.	Discussions were not directly applicable to impact assessment. HFIG is no longer operational at time of ES preparation.
March 2022	Introduction of the Project to the IFCA. Discussion of export cable corridor optioneering.	Discussions were not directly applicable to the impact assessment but EIFCA views

Date and consultation phase/ type	Consultation and key issues raised	Section where comment addressed
Applicant meeting with the Eastern Inshore Fisheries & Conservation Authority (EIFCA)		were sought on the proposed offshore ECC, which were taken into account in site selection.
Phase 2 Consultation (S42 Consultation on the PEIR)		
July 2023 S42 Consultation Marine Management Organisation (MMO) response	The MMO would like to encourage continued consultation and engagement with commercial fishers within the International Council for the Exploration of the Seas (ICES) area IVc. The MMO recommends early engagement with National Federation of Fishermen's Organisations (NFFO) and local harbour authorities, including the early appointment of a Fisheries Liaison Officer. The MMO will maintain a watching brief on anything that may fall within the MMO's remit – such as DML conditions.	The Applicant is committed to ongoing consultation and engagement, including with the NFFO. The Applicant has appointed a company FLO. Consultation and engagement outcomes are summarised in this table.
July 2023 S42 Consultation NFFO response	The proposed Outer Dowsing windfarm and export cable sites support a diverse and economically important fishing fleet. This is well characterised within the PEIR on some occasions; however, the use of fisheries-based data could have been used to enhance the characterisation of the baseline in areas where there is a paucity of data (e.g., the < 10 m fleet).	The Applicant acknowledges the shortage of spatial data relevant to the <10 m length fleet (noting that landings data does capture the <10 m fleet). The Applicant has sought to engage with the NFFO and other fisheries stakeholders to obtain all available and relevant baseline data. Engagement with fishers active in the Project area has been undertaken via the company FLO to validate and support other sources of baseline data.
July 2023 S42 Consultation NFFO response	We feel that engagement with local fishing fleets could have been improved leading up to the development of the PEIR, for example only 4 vessels from	As set out earlier in the table, engagement with local fishers commenced in 2021 and has been ongoing, led by the Applicant and company FLO.

Date and consultation phase/ type	Consultation and key issues raised	Section where comment addressed
	the Norfolk coast were consulted (Table 14.2), this is unlikely to represent all fishing businesses that will be impacted in the region.	This has specifically included trips to the Norfolk coastline to meet with local fishers. Since engagement with the NFFO in July 2023, the company FLO has again made a number of local port visits to engage with local fishers.
July 2023 S42 Consultation NFFO response	We welcome the commitment to the development of a Fisheries Liaison and Coexistence Plan. We would like to see this developed with all fisheries stakeholders in the region.	An outline Fisheries Liaison and Co-existence Plan (FLCP) has been developed by the Applicant and is supplied in support of the Application (see document 8.22).
July 2023 S42 Consultation NFFO response	We are concerned with the mis-match of data presented to describe the baseline. Landings data from the UK fleet is from 2017-2021 with no allowances made for the Covid 19 pandemic. Landings data for the EU fleet is dated (2012-2016) and pre-Brexit and do not reflect the current EU fleets operating in the region. The same mismatch is observed for the spatial data used, with three reference periods for the UK and EU VMS data and the AIS data. How can appropriate assessments be made with this mismatch in reference periods for the different data sources used? Inconsistencies in reference periods are highlighted by the fact that the scout data presented, highlights a high intensity of potting gear in the array area that is not highlighted in any of the other spatial data sources used. Additionally, the AIS data	The limitations of individual commercial fisheries datasets are transparently acknowledged in Section 14.4 of this chapter and in Commercial Fisheries Baseline Technical Report (Document Reference 6.3.14.1). Multiple datasets have been sourced and analysed to build up a robust understanding of fishing activity in the study area. Datasets used represent those that are publicly available and contain the most recent data that is available. In direct response to NFFO feedback, Section 14.4 of this chapter and Commercial Fisheries Baseline Technical Report (Document Reference 6.3.14.1) present an extended 11-year time series of landings data to enable corroboration of datasets. Engagement with fishers active in the Project area has been undertaken via the company

Date and consultation phase/ type	Consultation and key issues raised	Section where comment addressed
	presented does not distinguish between active fishing or transiting, leading to a misrepresentation in spatial distribution of effort. We would expect to see a consistency in the approach taken in analysing different evidence sources and a precautionary approach taken with regards to a lack of contemporary (< 5 y/o) data used.	FLO to validate and support other sources of baseline data.
July 2023 S42 Consultation NFFO response	Reference to the EIFCA stock assessments in Sections 14.3.37 and 14.3.43 are only relevant to < 6nm, i.e., the ECC area. Use of the Cefas stock assessments for the appropriate crab and lobster functional units should also be introduced as evidence for the wider region.	Section 14.4 of this chapter and Commercial Fisheries Baseline Technical Report (Document Reference 6.3.14.1) refer to both EIFCA and Cefas stock assessments, noting the relevance of each to different parts of the commercial fisheries study area.
July 2023 S42 Consultation NFFO response	The assessment of potential impacts makes several assumptions and conclusions that we disagree with when reviewing the data presented and feedback from our members in the region.	Areas of disagreement and responses are detailed in subsequent table rows. The Applicant welcomes engagement with the NFFO and has met with them to discuss each of these areas of disagreement.
July 2023 S42 Consultation NFFO response	We disagree with the assumption that potting effort can continue in the site post-construction (14.7.158). This is not known, as many factors influence whether potting can continue to take place in offshore windfarm sites. Using the example of the Westermost Rough site, where	As described in Section 14.7, potting activity will not be possible within the footprint of installed infrastructure and within any active Safety Zones. Beyond these areas, spacing between infrastructure allows for resumption of potting, and the impact assessment reflects this.

Date and consultation phase/ type	Consultation and key issues raised	Section where comment addressed
	potting has taken place post-construction, to justify this practice can take place in all sites is flawed. For example, within the Humber Gateway site (10 miles from Westermost Rough), potting effort has not returned to levels seen before the development in direct contradiction to the Westermost Rough example.	As discussed in a meeting with the NFFO, the Applicant acknowledges that experiences in resumption of fishing within operational UK windfarms vary based on local fishing practices and conditions within the array area. Regionally, and based on anecdotal information gathered by the company FLO, it is understood by the Applicant that fishers are deploying static gear within a operational windfarm array area. The assessment does acknowledge that 'the individual decisions made by the skippers of fishing vessels with their own perception of risk will determine the likelihood of whether their fishing will resume within the array area. Inclement weather will be a significant contributor to this risk perception.'
July 2023 S42 Consultation NFFO response	We disagree strongly that displacement of fishing effort has been scoped out of the cumulative impact assessment, this is done in the PEIR immediately after characterising the extensive spatial restrictions to fisheries in the region. Displacement of fishing is one of the key impacts that needs to be assessed at a cumulative scale, both from existing and upcoming spatial restrictions.	Displacement of fishing effort is assessed in the cumulative impact assessment presented in Section 14.8.
July 2023	The Eastern Inshore and Offshore Marine Plan, Policy FISH 1 states that "Within areas	Table 14.6 sets out a number of designed-in project measures that seek to minimise impacts

Date and consultation phase/ type	Consultation and key issues raised	Section where comment addressed
S42 Consultation NFFO response	of fishing activity, proposals should demonstrate in order of preference avoid, minimise, mitigate" impacts to commercial fisheries. The PEIR identifies impacts to the static gear sector as "medium/adverse", with mitigation suggested in response to following FLOWW guidelines regards disruption payments. What steps were undertaken to avoid or minimise impacts to commercial fisheries in accordance with Policy FISH 1? Avoiding these steps is in direct contravention of the Eastern Marine Plans.	on commercial fishing, including a reduction in project scale. Where significant impacts on commercial fishing are identified, despite the implementation of embedded measures, further mitigation measures have been proposed, as described in Section 14.7. This approach aligns with the stated policy.
July 2023 S42 Consultation NFFO response	We disagree with the assessment of displacement effects. Commercial fisheries in the region, both UK and EU fleets, are already subject to extensive spatial restrictions. The displacement effects of this development and others within the Southern NorthSea region will have a continued effect on all commercial fisheries and this needs to be assessed correctly.	The impact assessment presented in Section 14.7 acknowledges and assesses the potential for displacement across all Project phases. The assessment assumes that where the effects of exclusion are appropriately managed and mitigated, or where exclusion does not occur (e.g. where it is assumed fishing will resume within the operational Project) displacement effects should not be significant.
July 2023 S42 Consultation NFFO response	The commercial fisheries in the region can expect to see a vastly changing landscape through the lifespan of the Outer Dowsing project. The spatial squeeze on fisheries due to offshore developments in the region is already extensive and the likelihood of further restrictions with	The cumulative impact assessment presented in Section 14.8 considers the potential interaction of the Project with other planned developments, including designated sites. The commercial fisheries assessment considers and

Date and consultation phase/ type	Consultation and key issues raised	Section where comment addressed
	regards to the potential bans on mobile gear within MCZs also envisaged. Factors associated with the renegotiation of the Trade and Cooperation Agreement and consequent changes in access arrangements for EU vessels will also affect commercial fishing opportunities in the region. Whilst these elements are acknowledged in the PEIR as possible factors, they are not accounted for in the impact assessments or a contemporary setting.	describes the expected 'future baseline' within which the Project would be present (see Section 14.4 of this chapter and in Commercial Fisheries Baseline Technical Report (Document Reference 6.3.14.1).
July 2023 S42 Consultation NFFO response	It is recognised that the PEIR characterises a commercial fisheries baseline by analysing many different data sources to describe and analyse the commercial fisheries impact, but this needs a consistent reference period across all sources and inclusion of stakeholder expertise. The assumptions made, and subsequent impacts assessed from these data, do not align with the level of economic impact assessed, however, and we do not agree with them.	The limitations of individual commercial fisheries datasets are transparently acknowledged in Section 14.4 of this chapter and in Commercial Fisheries Baseline Technical Report (Document Reference 6.3.14.1). Multiple datasets have been sourced and analysed to build up a robust understanding of fishing activity in the study area. Datasets used represent those that are publicly available and contain the most recent data that is available.
July 2023 S42 Consultation NFFO response	In fisheries management, a precautionary principle is enacted where there is a paucity of relevant data or significant uncertainties. This does not seem to be the case for impact assessments. Limitations of data are acknowledged but do not seem to influence the outcomes of	In direct response to NFFO feedback, Section 14.4 of this chapter and Commercial Fisheries Baseline Technical Report (Document Reference 6.3.14.1) present an extended 11-year time series of landings data to enable corroboration of datasets.

Date and consultation phase/ type	Consultation and key issues raised	Section where comment addressed
	impact assessments: a flaw in the methodological design and interpretation.	Engagement with fishers active in the Project area has been undertaken via the company FLO to validate and support other sources of baseline data. The assessment (see Section 14.7) identifies the potential for significant impacts to the UK potting fleet and acknowledges the need for further mitigation in response.
July 2023 S42 Consultation NFFO response	Whilst we appreciate the difficulties in assessing impacts with limited data sources, we feel that the effects of this needs to be fully accounted for in the methodology. This development will have a direct impact on commercial fisheries and their communities, and we feel the PEIR under-represent these.	
Applicant meeting		
August 2023 Applicant meeting with EIFCA	Discussion of commercial fisheries baseline data and potential additional sources of EIFCA data. Presentation of PEIR outcomes.	The Applicant has submitted a request to the EIFCA regarding potential additional fisheries baseline data. EIFCA data available to the Applicant have been considered in Section 14.4 of this chapter and in Commercial Fisheries Baseline Technical Report (Document Reference 6.3.14.1).
October 2023 Applicant meeting with NFFO	Presentation of PEIR outcomes. Discussion of NFFO responses to the PEIR consultation. Confirmed HFIG currently not operating.	See table row entries above in relation to Applicant responses to NFFO PEIR consultation responses.

14.4 Baseline Environment

14.4.1 Study Area

19. The Project is located across the boundary of ICES Divisions 4b (central North Sea) and 4c (southern North Sea), within the UK Exclusive Economic Zone (EEZ) waters, with the array area located outside the 12 nautical mile (nm) limit. For the purpose of recording fisheries landings, ICES Divisions are divided into statistical rectangles which are consistent across the UK, Norway and European Union Member States operating in the North Sea.

20. The Project array area is located within ICES rectangles 36F1 and 35F1. The offshore Export Cable Corridor (ECC), inclusive of the area for the potential Offshore Reactive Compensation Platforms (ORCPs), is within rectangles 35F1 and 35F0, with a very small portion in 36F1, as shown in Figure 14.1 of Volume 2 Appendix 14.1 (document reference 6.3.14.1).
21. Since the westernmost array area boundary lies outside of but immediately adjacent to ICES rectangle 36F0, the commercial fisheries study area has been defined as ICES rectangles 36F0, 36F1, 35F0 and 35F1. The Project array area occupies approximately 6% of rectangles 36F1 and 35F1. The offshore ECC occupies approximately 2% of rectangles 36F1, 35F1 and 35F0.
22. The study area also fully incorporates the potential compensation areas shown in Figure 14.1 of Volume 2 Appendix 14.1 (document reference 6.3.14.1), which includes two areas for Artificial Nesting Structures (ANS) and areas for biogenic reef restoration.

14.4.2 Data Sources

23. Baseline data collection has been undertaken to obtain information over the study area shown in **Error! Reference source not found.**Table 14.3.
24. The data sources that have been collected and used to inform this commercial fisheries assessment are summarised in Table 14.3 and fully presented in Appendix 14.1: Commercial Fisheries Baseline Technical Report (Document reference 6.3.14.1). The data that have been sourced are recognised as being the most up-to-date publicly available data.
25. Landings statistics for UK registered vessels were obtained from the Marine Management Organisation (MMO) with the following parameters: year; month; gear type; ICES rectangle; species; live weight (tonnes) and first sales value (£) across a five-year period (2017 to 2021). During preparation of this assessment, landings statistics also became available for 2022 and have been incorporated into the baseline. Reflecting NFFO feedback to the PEIR consultation, a longer time-series of landings data has also been considered, spanning 2011 to 2022.
26. Landings data for all species are collected via the European Union (EU) logbooks scheme and recorded by ICES statistical rectangle and stored in the EU DCF database, accessible through the EU Joint Research Committee. Landings data have been collated for all EU Member States for the ICES statistical rectangle that overlap the commercial fisheries study area. Landing statistics were collated across five years (2012 to 2016). Landing statistics include all landings by that country's nationally registered vessels into all ports. The following parameters were examined: year; season (quarter); gear type; ICES rectangle; species; effort (hours fished); and live weight (tonnes). It is noted that the most recently published MMO landings statistics also include records of landings by non-UK vessels into UK ports, providing some additional and more current insight into EU vessel activity in the commercial fisheries study area.
27. Vessel Monitoring System (VMS) is a form of satellite tracking using transmitters on board fishing vessels. Annual VMS data are collated by the MMO for all vessels ≥15m registered to the UK, including all gear types. VMS data for UK vessels have been analysed for 2016 to 2019.
28. All EU fishing vessels (i.e., fishing vessels flying the flag of an EU Member State), and third-party fishing vessels operating in EU waters, that are ≥12m in length, are required to have a VMS on board. This reports the vessels' position to fisheries management authorities, in the case of EU fishing vessels, every two hours. Since 1 January 2012, this obligation has applied to vessels that are ≥12m in length (before 1 January 2012 it applied to vessels ≥15m in length, see Council Regulation (EC) No 1224/2009).
29. Through a European wide data call, ICES collated VMS data for vessels ≥12m operating mobile gear that has contact with the seabed. This VMS data set includes vessels registered to the following countries: Belgium, Denmark, France, Germany, the Netherlands, Ireland, Sweden and UK. Data is amalgamated for all countries and not available on a country-by-country basis; data has been analysed over a five-year period from 2016 to 2020.

30. Information on fisheries activity specifically in the Project area, gathered via marine traffic surveys and fisheries scouting surveys, has also been analysed. In addition to analysis of fisheries data, various sources of literature have been reviewed to inform the assessment. These include Eastern IFCA publications and species stock assessments published by ICES and Cefas. Literature sources are cited and fully referenced in Commercial Fisheries Baseline Technical Report (Document Reference 6.3.14.1).

Table 14.3 Data sources used to inform the assessment.

Data	Time period covered	Source
Landings statistics		
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. Landings statistics for the period 2018 to 2022, published in September 2023, also include statistics for non-UK vessels landing into UK ports.	2011 to 2022	MMO
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).	2012 to 2016	European Union (EU) Data Collection Framework (DCF) database
Spatial data		
VMS data for UK registered vessels ≥15m length. Note that UK vessels ≥12m in length have VMS on board, however, to date, the MMO provide amalgamated VMS datasets for ≥15m vessels only. VMS data sourced from MMO displays the first sales value (£) of catches.	2016 to 2020	MMO
VMS data for EU registered vessels ≥12m length. VMS data sourced from ICES includes data that displays the surface Swept Area Ratio (SAR) of catches by different gear types and covers EU (including UK) registered vessels 12m 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	2017 to 2020	ICES

Data	Time period covered	Source
surface. Surface SAR provides a proxy for fishing intensity.		
Fishing vessel route density, based on vessel Automatic Information System (AIS) positional data. AIS is required to be fitted on fishing vessels ≥15m length.	2019 to 2022	European Maritime Safety Agency (EMSA)
Site survey data		
Project marine traffic (AIS, radar and visual observation) survey data.	Summer 2022 and Winter 2023	Anatec
Project fisheries scouting survey data, noting fishing gear and vessel observations.	2021 and 2022	NFFO Services

Data Limitations

31. Limitations of landings data include the spatial size of ICES rectangles which can misrepresent actual activity across the Project area and care is therefore required when interpreting the data.
32. While it is recognised that there is no statutory requirement for owners of vessels 10m and under to declare their catches, registered buyers are legally required to provide sales notes of all commercially sold fish and shellfish under the Registration of Fish Buyers and Sellers and Designation of Fish Auction Sites Regulations 2005 (RBS legislation). The RBS legislation is applicable to licenced fishing vessels of all lengths and requires name and port letters and numbers (PLN) of the vessel which landed the fish to be recorded in relation to each purchase. For the 10m and under sector, landing statistics are recorded on sales notes provided by the registered buyers (MMO, 2021a). 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, 2021a).
33. 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 landings data (2017-2019) is no longer available by ICES rectangle. Data at a scale of ICES division (i.e., the whole of the southern North Sea) is less useful to understand fishing activity specific to the area overlapping the Project. It is however noted that recently published MMO landings statistics incorporate data on landings by non-UK vessels into UK ports.

34. Limitations of VMS data are primarily focused on the coverage being limited to larger vessels 15m and over for UK fishing vessels. 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 do not include vessels typically operating in inshore area (i.e., which typically comprises of 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 Automatic Identification System (AIS) and radar has been analysed alongside VMS data. Information on fishing activity gathered by the FLO, and via long-term fisheries scouting surveys, has also been considered.
35. 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 form 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 14.7.

14.4.3 Existing Environment

36. This section provides a brief overview of all landings from the Project commercial fisheries study area followed by a summary analysis on a fishery-by-fishery basis.
37. A detailed description of the existing environment is provided within in Appendix 14.1: Commercial Fisheries Baseline Technical Report (Document reference 6.3.14.1), which includes detailed landings statistics analysis, consideration of the seasonality of fishing activity, fishing activity spatial mapping, descriptions of fishing gear and vessel characteristics, and profiles of the fishing activity on a country-by-country basis. Baseline fishing activity in the array area, offshore ECC, ANS areas and biogenic reef restoration area is described in the Appendix. To avoid duplication, this section provides a succinct overview and should be read in conjunction with the Appendix.

Overview of Landings from the Study Area

38. The annual average value of landings by UK-registered vessels from the four ICES rectangles that comprise the study area is shown in Plate 14.1 below.
39. Of the four rectangles, landings across the six-year 2017 to 2022 period have been consistently of greatest value in inshore ICES rectangle 36F0 within which no Project infrastructure will be located but within which an ANS area is located. The average annual value of landings from ICES rectangle 36F0 from 2017 to 2021 was £11.7 million whilst equivalent values across the other three rectangles ranged between £1.7 million and £2.3 million.

40. Over the same six-year period, over 99% of landings by UK vessels from the study area are of shellfish species. Over 92% of all landings by UK vessels from the study area are made by vessels registered in England, with remaining landings accounted for by Scottish-registered vessels. Vessels active in the study area are primarily landing their catches to Bridlington and Grimsby, with lesser landings made to other regional ports including Wells and Hornsea.

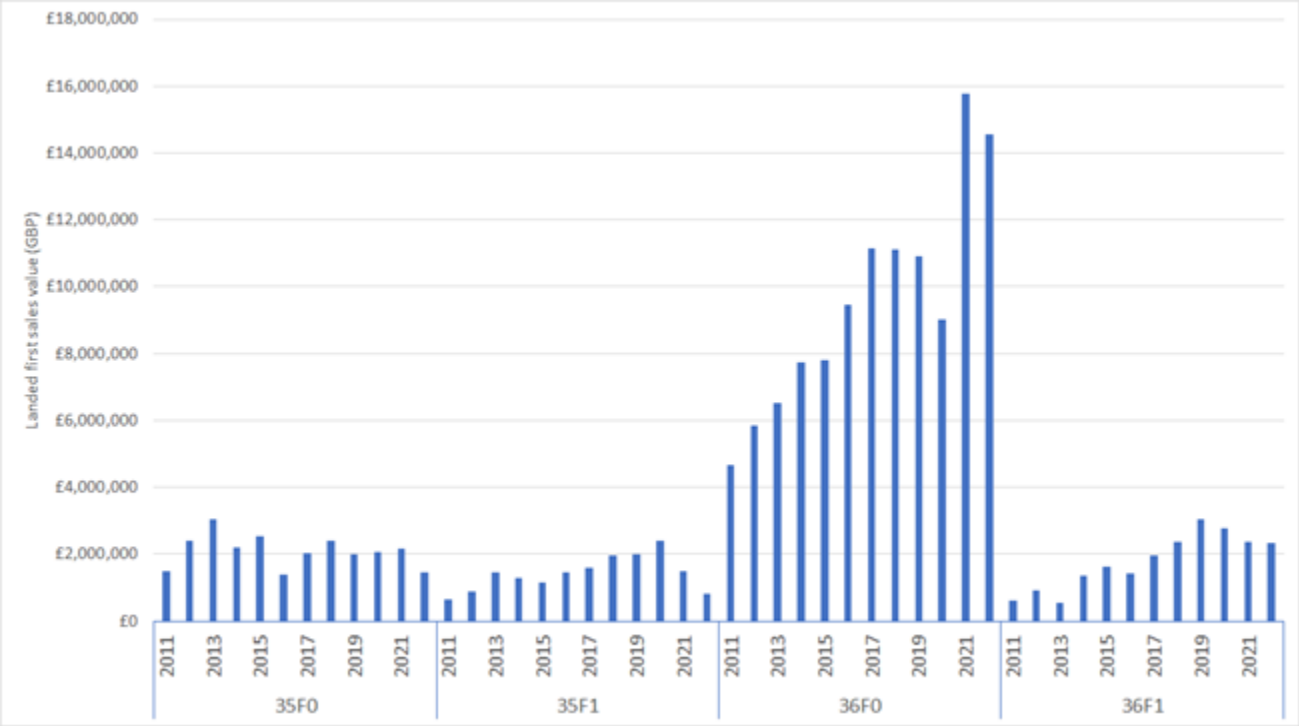

Plate 14.1: Value of landings (2011 to 2022) from the study area by ICES rectangle by UK vessels (Source: MMO, 2023)

41. Focusing in on those ICES rectangles where the array area and offshore ECC are located, Plate 14.2 indicates that the key species landed from ICES rectangle 35F0 (inshore portion of offshore ECC, and location of the biogenic reef restoration area) are cockles *Cerastoderma edule*, brown crabs *Cancer pagurus*, whelks *Buccinum undatum*, brown shrimps *Crangon* and lobsters *Homarus gammarus*. A brown shrimp beam trawl fishery and hand-worked cockle fishery are both focused on The Wash, to the south of the offshore ECC. The key species landed from ICES rectangle 35F1 (outermost portion of offshore ECC and artificial nesting structure area of search) are whelks, lobsters and brown crabs. Key species landed from ICES rectangle 36F1 (array area) are brown crabs, lobsters and whelks.
42. By both weight and value, landings from all rectangles have shown some fluctuation across the six-year time series but have been relatively consistent in rectangles 35F0 and 35F1 whilst showing an increasing trend in 36F0 and 36F1.

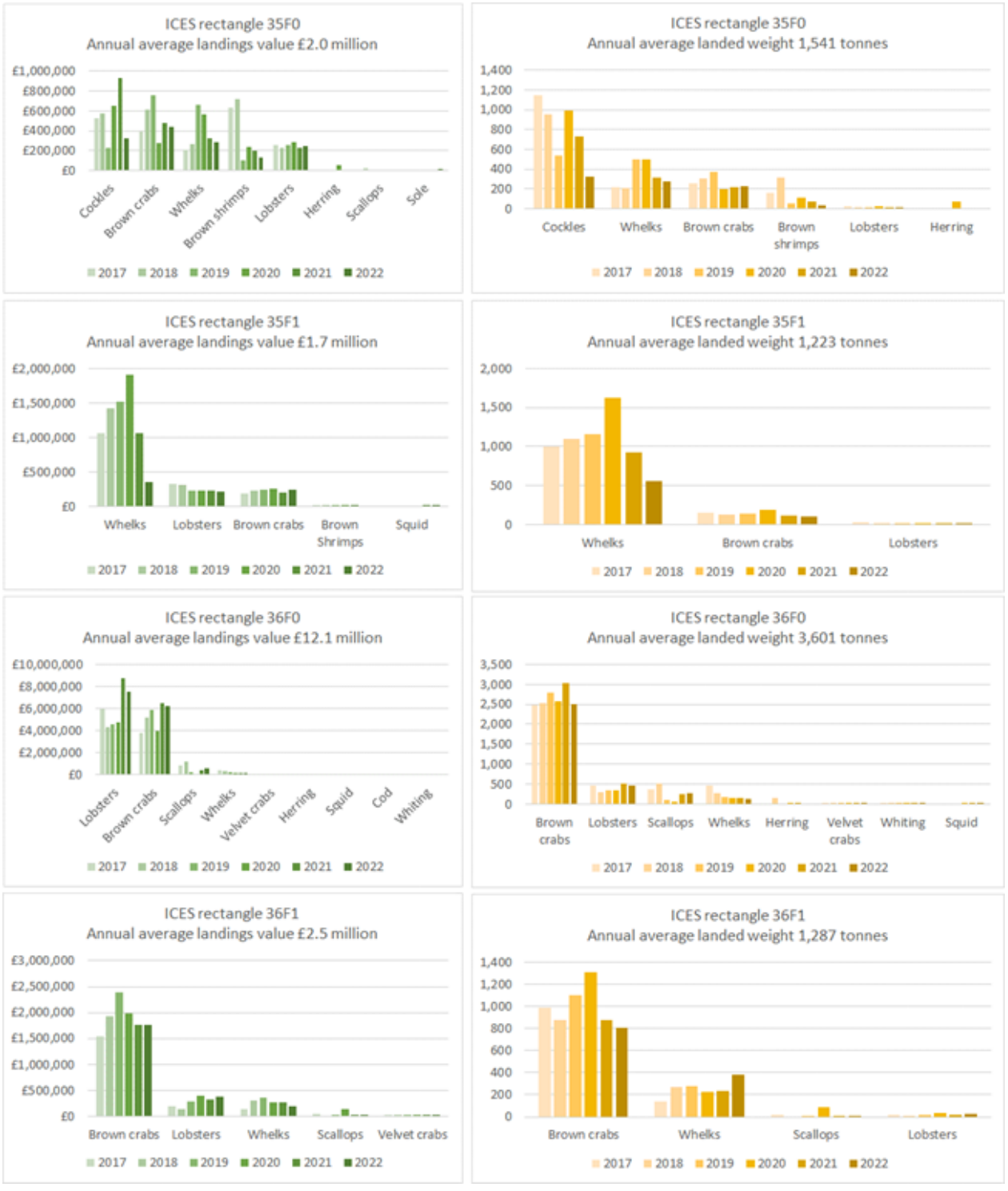

Plate 14.2: Key species by annual landed value (GBP) and weight (tonnes) (2017 to 2022) from ICES rectangles 35F0, 35F1, 36F0 and 36F1 by UK vessels (Source: MMO, 2023)

43. Within the UK exclusive economic zone, fishing activity from the shore to 6nm is only permissible for UK-registered vessels. A number of restrictions are in place based on byelaws set by English Inshore Fisheries and Conservation Authorities that control fisheries out to 6nm. From 6nm to 12nm, non-UK vessels may fish if they have acquired historical rights to do so. Outside 12nm, international vessels are permitted to fish subject to quota allocation and other EU level restrictions including technical gear measures and effort restrictions such as days at sea.
44. Landings data sourced from the EU DCF database indicate that there is likely to be some non-UK fishing activity in the study area. In ICES rectangles 35F0 and 35F1 (offshore ECC, location of the biogenic reef restoration area and portion of the artificial nesting structure areas of search), the majority of landings are made by UK-registered vessels, with EU landings data indicating some presence of French otter trawlers and Dutch beam trawlers. In ICES rectangle 36F1 (array area and portions of nesting structure areas of search), data indicate the presence of French and Danish otter trawlers, and Belgian and Dutch beam trawlers, though most recent data again indicate that the majority of landings from this rectangle are made by UK-registered vessels. Non-UK fishing vessels active in the study area primarily target plaice *Pleuronectes platessa*, sole *Solea solea* and other demersal species, with evidence of sporadic pelagic trawl activity, targeting mackerel *Scomber scombrus* and herring *Clupea harengus*. Historically, a Danish sandeel *Ammodytes marinus* fishery was active in the study area, which has declined substantially since its peak in 2004.

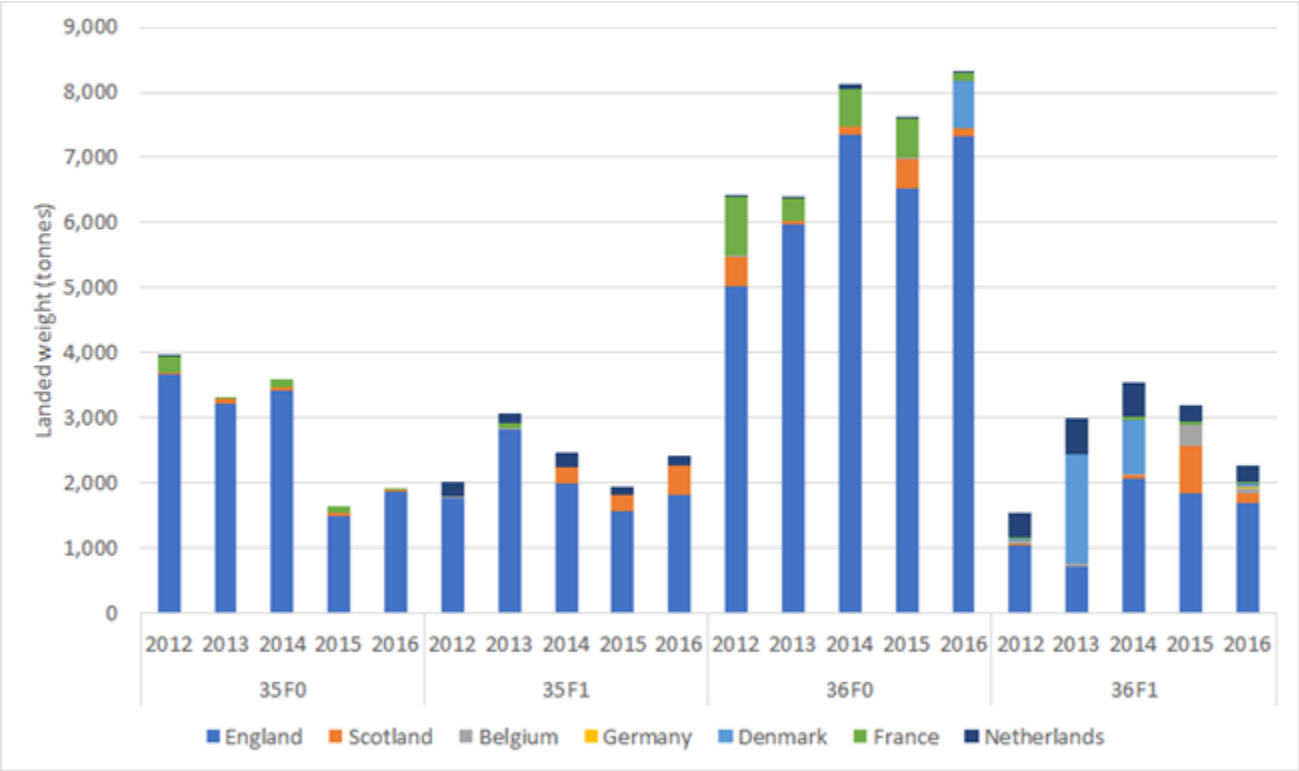

Plate 14.3: Average annual landed weight (tonnes) landed by the UK and EU countries from the study area (2012 to 2016) (Source: EU DCF, 2022)

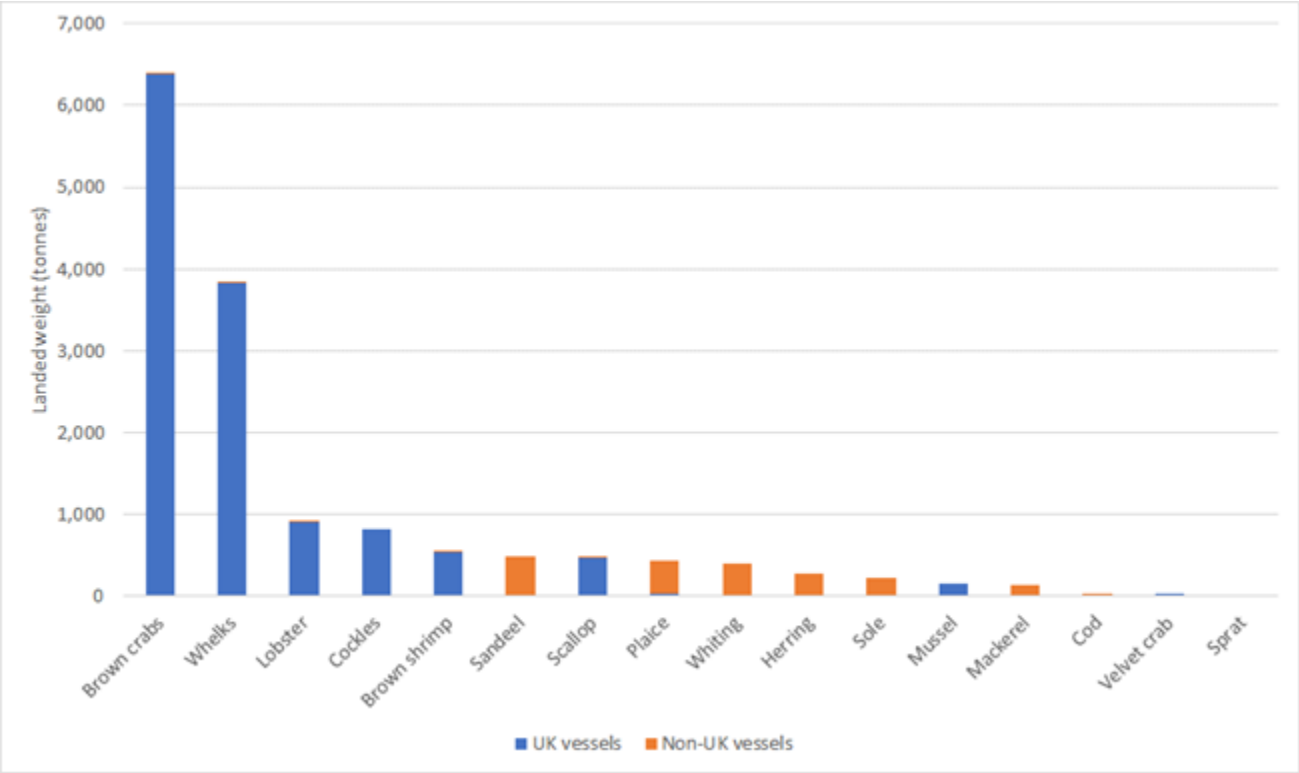

Plate 14.4: Average annual landed weight (tonnes) landed by species by UK and EU vessels from the study area (2012 to 2016) (Source: EU DCF, 2022)

Description of Fishing Fleets Active in the Study Area

Pots and Traps

45. In ICES rectangle 36F1 (array area) UK potting vessels target brown crab, whelk and lobster with an average annual landed value of £2.4 million (2017 to 2022) for all vessels. Brown crab landings account for almost 80% of this value. In ICES rectangles 35F0 and 35F1 (offshore ECC) whelks dominate landings values and had an average annual landed value of £1.6 million across the 2017 to 2022 period. Within these rectangles, brown crab (£717,000) and lobster (£506,000) are also targeted using pots.
46. Within the three ICES rectangles, landings of brown crab peak between July and November. Over the six-year study period, landed weights of brown crab have been relatively consistent, peaking in 2020 at approximately 1,700 from all three rectangles, with 1,300 tonnes of that total landed from rectangle 36F1 (array area). In 2022 the equivalent landed weight from all three rectangles was 1,100 tonnes.

47. In the ANS area to the northwest of the array area, data indicate the presence of highly valuable potting grounds, with potting vessels targeting lobster, crab and whelk. Data also indicate the potential presence of dredgers targeting scallops and of vessels deploying demersal seine gear to target squid. In the ANS area located to the southeast of the array area, data indicate the presence of potting vessels targeting lobster, crab and whelk. UK landings from the biogenic reef restoration area are dominated by vessels targeting crabs, lobsters and whelks with pots.
48. Lobster is one of the highest value per kilogram, commercially exploited shellfish species found in UK waters. Fishing activity peaks in late summer and immediately before Christmas in the study area. Landings of lobster have been relatively consistent over the six-year study period, with approximately 50 tonnes landed from the three ICES rectangles in 2021 and 2022.
49. Whelk fisheries have typically been expanding around the UK in recent years as prices have increased and export to non-EU countries has grown. Whelk landings from the study area indicate a seasonal peak across spring months, though they are landed year-round. Over the six-year study period, landed weights of whelk have been relatively consistent, peaking in 2020 at approximately 2,300 tonnes from all three rectangles, with 1,600 tonnes of that total landed from rectangle 35F1 (offshore ECC).
50. Activity mapping for potting activity is shown in Appendix 14.1: Commercial Fisheries Baseline Technical Report (Document Reference 6.3.14.1) in Figure 14.16 and Figure 14.17. VMS data indicates potting activity for vessels ≥15m in length and is therefore not fully representative of the fleet. The UK VMS data indicates potting activity within the array area and offshore ECC. This is corroborated by marine traffic survey data (see Section 3.5, Appendix 14.1: Commercial Fisheries Baseline Technical Report, Document Reference 6.3.14.1) and engagement with individual fishermen known to be active in the Project area. It is understood that brown crab are the key species targeted further offshore in the array area and that whelks are also fished. Along the offshore ECC, whelk dominate fishing activity in terms of landed value and weight, but brown crab and lobster are also targeted.
51. The potting fleet active in the study area is comprised of vessels of both under and over 10m length with a range of varying capabilities. A number fish in close proximity to the shore on historic fishing grounds, landing catches to local ports including Wells and Kings Lynn, while larger vessels, including vivier crabbers, target both inshore and offshore grounds and land their catches to Bridlington and Grimsby.

52. When targeting brown crab and lobster, parlour pots are favoured for more offshore locations. Vessels may operate 1,000 to 3,500 pots in total, with 20 to 30 pots per string for a typical vessel, and up to 50 per string for larger vessels; pots are spaced 15 fathoms apart. Pots are shot away with the tide; one string can cover up to 0.3nm. Soak time is commonly 24 to 48 hours before pots are hauled. Whelks are predominately targeted in muddy habitats, and not generally found on mobile sand or rocky ground. Commercial vessels within the Eastern IFCA jurisdiction are limited to 500 pots with an internal volume of 30 litres per vessel, as per the Whelk Permit Byelaw 2016. All whelk pots must have a minimum of two escape holes at least 24mm in diameter per pot and must be tagged with EIFCA supplied tags. There are no pot limits outside 6nm; when targeting whelk, vessels operating outside 6nm typically deploy up to 1,500 to 2,000 pots, with 50 to 100 pots per string and 10 fathoms between pots.

Dredge

53. Dredges are rigid structures that are towed along the seabed to target various species of shellfish. In the study area, they are operated by larger UK vessels over 15m length and used to target king scallop.
54. Landings data and activity mapping data (shown in Appendix 14.1: Commercial Fisheries Baseline Technical Report, Document Reference 6.3.14.1 in Figure 20 to Figure 3-22) indicate that whilst UK dredge vessels operate within the study area, activity is focused on ICES rectangle 36F0, on scallop grounds to the north of, and outside of, the offshore ECC. Within ICES rectangle 36F1 (array area), annual average landings by UK dredge vessels were £42,000 over the six-year study period. Activity mapping data indicate that whilst there is scope for occasional scallop dredging within the north-western extent of the array area, targeted scallop grounds within rectangle 36F1 are located to the north-east of DCO boundaries.
55. Vessels targeting scallop locally typically land their catch into Hartlepool, with landings peaking between May and August.

Beam Trawl

56. UK beam trawl activity within the study area is focused in ICES rectangle 35F0 (inshore portion of offshore ECC and biogenic reef restoration area), with limited activity in other parts of the study area. The UK beam trawl fleet in the study area target the brown shrimp fishery in The Wash. Vessels engaged in this fishery operate principally in inshore waters, normally from 0nm to 6nm and are from 7m to 18m in length, using ‘light’ trawl gear. Landings data indicate an overall decline in the brown shrimp fishery over the study period; during a 2018 peak over 280 tonnes brown shrimp were landed from ICES rectangle 35F0 and in 2021 the equivalent weight was approximately 50 tonnes (valued at £145,000), and in 2022 was 34 tonnes (£116,000).

57. Shrimp beam trawling activity predominantly occurs in The Wash embayment, and to a lesser extent along the North Norfolk coast and catches are landed to Kings Lynn. Activity mapping for UK beam trawl activity is shown in Document Reference 6.3.14.1in Figure 3-24. VMS data indicate that there is potential for some brown shrimp beam trawl activity within the nearshore portion of the offshore ECC.
58. EU beam trawlers deploy trawl nets that are held open by a heavy steel beam which is towed along the seabed on a line approximately three times the depth of the water. Some beam trawls include tickler chains, which drag along the seabed in front of the net, disturbing fish in its path and encouraging them to rise into the net. Beam trawls can range in length from 4m to 14m and each trawler tows two beam trawls at a time from derricks on either side of the vessel. EU beam trawlers from the Netherlands and Belgium are understood to be active across ICES rectangles 35F1 and 36F1. These vessels are typically over 25m in length and primarily target plaice and sole. In 2016 landings from these two ICES rectangles by Dutch vessels totalled 200 tonnes, and by Belgian vessels totalled 38 tonnes.
59. Activity mapping for EU beam trawl activity is shown in Appendix 14.1: Commercial Fisheries Baseline Technical Report (Document Reference 6.3.14.1) in Figure 3-23. It indicates limited EU beam trawl activity within DCO boundaries, with fishing grounds targeted by EU beam trawlers located to the east of the array area.

Otter Trawl

60. Landings data indicates that UK demersal otter trawl activity is limited within the study area. Activity mapping for UK otter trawl activity is shown in Appendix 14.1: Commercial Fisheries Baseline Technical Report (Document Reference 6.3.14.1) in Figure 3-27 and also indicates limited UK otter trawl activity within DCO boundaries.
61. EU otter trawlers use a cone-shaped net which is held open by water pressure on two otter boards. The net is towed either across the seabed or within the water column. Fish are herded between the boards into the mouth of the trawl and then forced along a funnel into the end of the net. Net mesh sizes can be altered to target different fish species.
62. French otter trawlers, primarily targeting whiting, are understood to be active in the study area with the majority of their landings being made from ICES rectangle 35F0 (offshore ECC and biogenic reef restoration area). In 2016 French otter trawlers landed a total catch of 6 tonnes from ICES rectangle 35F0, and 3 tonnes from rectangle 36F1. Activity mapping for EU otter trawl activity is shown in Appendix 14.1: Commercial Fisheries Baseline Technical Report (Document Reference 6.3.14.1) in Figure 3-26. It indicates the potential for some French otter trawl activity across the central portion of the offshore ECC.

63. There has been a historical fishery for sandeel and sprat by Danish vessels in the North Sea, with previously targeted sandeel grounds understood to overlap with the north-eastern extent of the study area. A significant sandeel fishery was targeted in this area between 2003 and 2004. The value of landings fell significantly from 2004 onwards. The Total Allowable Catch for sandeel and sprat in the North Sea is set at zero for 2023, limiting Danish fishing opportunities, but negotiations in March 2023 have resulted in a TAC of 33,969 tonnes of sandeel in ICES division 4. Over 93% of this TAC is allocated to Danish fisheries, with just under 3% allocated to UK fisheries (European Commission, 2023).

Other Gear Types

64. Demersal seine netting (also referred to as flyseine) is a fishing method involving use of long weighted ropes to herd fish into the mouth of a trawl to target demersal species which live or feed on or near the seabed. Flyseine activity in the Channel and southern North Sea is understood to be increasing, involving a relatively small number of powerful vessels, which are either purpose-built or converted beam trawlers (Defra, 2022). MMO landings data validate this trend, with 2021 being the only and first year within the six-year study period that landings by demersal seine were made, with target species including squid *Loligo*, mullets *Mugilidae* and whiting. In 2021, landings from ICES rectangles 35F1 and 36F1 totalled 13 tonnes and were valued at £13,500. Equivalent values in 2022 were 3 tonnes and £7,500.
65. Fixed nets include gill, tangle and trammel nets. They are typically used by small English-registered inshore vessels which target bass, sole and rays. The nets are usually fished in groups (or fleets) with the end of each fleet attached by bridles to a heavy weight, or anchor, on the seabed. Each weight, or anchor, is attached to a marker buoy or dhan flag, on the surface, by a length of rope equal to about twice the depth of water. Net lengths can vary significantly; individual nets can vary from 50 m to 200 m. The soak times, the time that a fleet is left fishing for, can range from a six-hour tidal soak up to 72 hours. Smaller vessels under 10 m length are typically engaged in netting and may work both pots and nets, alternating between gears seasonally. Net catches can provide bait for pots. Landings by nets are recorded in ICES rectangle 35F1 (landings are not recorded from offshore rectangles) and averaged 0.7 tonnes across the six-year study period, and having an average annual value of £930.
66. Pelagic or mid-water trawls are towed at the appropriate level in the water column to intercept shoaling fish such as herring, mackerel and sprat. The location of the shoals is determined by sonar or vertical sounder echoes. Landings data indicates that there may be occasional, highly sporadic activity by large over 30m Danish and French pelagic trawlers in the study area. Whilst pelagic trawl activity was more substantial in the early 2000's, landings from the study area by EU pelagic trawlers have declined substantially since 2010, averaging 60 tonnes per year between 2010 and 2016.

67. A hand-worked cockle fishery exists in The Wash. The hand-worked cockle fishery is accessed from the sea, using vessels that dry out on the intertidal cockle beds in The Wash at low water. It is common practice for cockle hand-workers to prepare the area to be fished by manoeuvring the fishing vessel in shallow water in such a manner as to displace the upper layer of sediment from the substratum, effectively bringing cockles to the surface of the seabed. The Eastern IFCA manages the cockle fisheries in The Wash under the Wash Fishery Order 1992, which expired in January 2023 and has been replaced by new management measures referred to as the Wash Interim Measures Cockle Fishery 2023. Current fishery management measures include restrictions on fishing methods, temporary closures, closed areas, limits on vessel lengths and daily catches, minimum landings sizes and TACs (EIFCA, 2019, 2023).

68. Given the location of the cockle beds, there is not expected to be any cockle fishery activity in the Project Order Limits.

Summary

69. A summary of fishing fleets active in the study area, with a focus on those expected to be active in the Project array area and offshore ECC, is provided in Table 14.4.

Table 14.4 Summary of fishing fleets active in the study area

Fishing Fleet	Array Area	Offshore Export Cable Corridor
UK fishing fleets		
UK potting (static gear)	Vessels over 12m length primarily targeting brown crab, some whelk and lobster.	Vessels of both under and over 10m length targeting whelk, brown crab and lobster.
UK dredge (mobile gear)	Limited activity; vessels of over 15m length targeting scallop.	Negligible activity.
UK beam trawl (mobile gear)	Negligible activity.	Vessels mostly over 10m length targeting brown shrimp in the nearshore.
Other	Potential for: ▪ Occasional demersal seine activity, with vessels over 18m length targeting whiting, squid and mullets.	Potential for: ▪ Occasional demersal seine activity with vessels over 18m length targeting whiting, squid and mullets; and ▪ Low levels of netting and hooked gear/longline activity.
Non-UK fishing fleets		
EU beam trawl (mobile gear)	Limited activity; Dutch and Belgian vessels targeting plaice and sole.	Negligible activity.
EU demersal otter trawl (mobile gear)	Negligible activity.	Limited activity; French trawlers targeting whiting across the central portion of the offshore ECC.

Fishing Fleet	Array Area	Offshore Export Cable Corridor
Other	Potential for: ▪ Very occasional and sporadic pelagic trawl activity, with large vessels targeting pelagic species such as herring and mackerel.	Negligible activity.

Designated Sites

70. In order to protect particular features of designated sites, fisheries management mechanisms may be put in place. These mechanisms can include spatial closures, permit schemes, effort controls, vessel size and fishing gear restrictions and seasonal fishing restrictions. These mechanisms are implemented by the relevant IFCA in waters out to 6nm and by the MMO in waters between 6nm and 12nm.

71. Within designated sites that are coincident or proximate to the Project, several spatial closures to protect designated features have been established via byelaws that are relevant to fisheries activity within the study area. These include closures to fishing vessels using bottom towed fishing gear in specified areas of reef or sandbank within the Inner Dowsing Race Bank and North Ridge Special Area of Conservation (SAC), and closures to static fishing gear in specified areas of reef in the same SAC.

14.4.4 Future Baseline

72. Commercial fisheries patterns change and fluctuate based on a range of natural and management-controlled factors. This includes the following:

- Market demand: commercial fishing fleets respond to market demand, which is impacted by a range of factors, including the 2020 to 2021 COVID 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 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 e.g., 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.

73. 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 five years of key baseline data. 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 do not capture any potential changes in commercial fisheries activity resulting from the withdrawal of the UK from the EU.
74. Following withdrawal, the UK and the EU have agreed to a Trade and Cooperation Agreement (TCA), applicable from May 2021. The TCA sets out fisheries rights and confirms that from 1 January 2021 and during a transition period until 30 June 2026, UK and EU vessels will continue to access respective Exclusive Economic Zones (EEZs, 12nm to 200nm) to fish. In this period, EU vessels will also be able to fish in specified parts of UK waters between 6nm to 12nm.
75. 25% of the EU's fisheries quota in UK waters will be transferred to the UK over the five-year transition period; 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 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 vessels would need to access quota holdings. There has been limited change in the overall UK share for plaice and sole, the key fisheries targeted by non-UK vessels, notably Dutch and Belgian beam trawlers.
76. Market changes have the potential to impact fishing activity in the 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. A key species landed by potters in the area, is whelk, which is primarily exported to non-EU countries, including Korea, Taiwan and Singapore. The trade in UK landed whelk has therefore not been as affected by the Brexit process and associated implications on shellfish exports in comparison to other species. In terms of future baseline scenarios, it is therefore possible, for example, that the UK fleet will more heavily target whelk given that prices have increased in recent years and they are exported to non-EU countries.
77. In relation to EU access to UK territorial waters, provision has been made for EU vessels with a track record of fishing between 6nm and 12nm to be issued with licences to continue fishing. This licencing process is ongoing and it is unknown how many EU vessels this is applicable to. Therefore, fishing activity within the study area is likely to remain consistent with the current baseline in terms of the fleets and Member States in operation.

78. In relation to the effects of the COVID pandemic, MMO annual reporting notes that the effects of the pandemic on the UK fishing industry were felt from March 2020. The MMO UK Sea Fisheries Statistics 2021 report observes that an increase in overall UK landings quantity and value in 2021 (relative to 2020) largely reflected recovery from the COVID period and additional quota available to the UK fleet after leaving the EU (MMO, 2022).
79. Commercial fisheries receptors (i.e., relevant fishing fleets) could theoretically be impacted by climate change over the lifetime of the project. Increased sea temperature/change in pH levels have the potential to affect the distribution of commercially targeted fish and shellfish stocks in the commercial fisheries study area. Changes may result from changes in seabed habitat or natural disturbance events. Changes would be expected to have limited effects on mobile species, but with potential for effects on substrate-dependent species such as herring and sandeel, and on shellfish. Changes may in turn affect commercial fishing activity in the study area over the long-term; for example, altering fishing methods, targeted grounds and seasonal patterns in activity. An increase in storm events may also directly impact fishing activity in the study area, with changes with seasonal fishing patterns in response to changes in weather and periods of safe fishing conditions.
80. Climate change could potentially cause changes in patterns of fishing activity over the lifetime of the project. Climate change does not alter the basis or conclusions of the assessments made in relation to commercial fisheries as presented in this chapter.

14.5 Basis of Assessment

14.5.1 Scope of the Assessment

81. This section sets out the scope of the ES assessment for commercial fisheries. This scope has been developed as the Project design has evolved and responds to feedback received to-date as set out in Section 14.3.

Impacts Scoped in for Assessment

82. Potential impacts on commercial fisheries receptors that have been scoped in for further assessment are summarised below, in line with the Scoping Opinion.
83. The following impacts have been scoped into this assessment:
    - Construction:
        - Impact 1: Reduction in access to, or exclusion from established fishing grounds;
        - Impact 2: Displacement leading to gear conflict and increased fishing pressure on adjacent grounds;
        - Impact 3: Disturbance of commercially important fish and shellfish resources leading to displacement or disruption of fishing activity;
        - Impact 4: Increased vessel traffic associated with the Project within fishing grounds leading to interference with fishing activity;

- Impact 5: Additional steaming to alternative fishing grounds for vessels that would otherwise fish within the Project area;

- Operation and maintenance:
  - Impact 6: Reduction in access to, or exclusion from established fishing grounds;
  - Impact 7: Displacement leading to gear conflict and increased fishing pressure on adjacent grounds;
  - Impact 8: Disturbance of commercially important fish and shellfish resources leading to displacement or disruption of fishing activity;
  - Impact 9: Increased vessel traffic associated with the Project within fishing grounds leading to interference with fishing activity;
  - Impact 10: Additional steaming to alternative fishing grounds for vessels that would otherwise fish within the Project area;
  - Impact 11: Physical presence of infrastructure leading to gear snagging;
- Decommissioning:
  - Impact 12: Reduction in access to, or exclusion from established fishing grounds;
  - Impact 13: Displacement leading to gear conflict and increased fishing pressure on adjacent grounds;
  - Impact 14: Disturbance of commercially important fish and shellfish resources leading to displacement or disruption of fishing activity;
  - Impact 15: Increased vessel traffic associated with the Project within fishing grounds leading to interference with fishing activity;
  - Impact 16: Additional steaming to alternative fishing grounds for vessels that would otherwise fish within the Project area; and
  - Impact 17: Physical presence of infrastructure leading to gear snagging.

84. In line with the Scoping Opinion (The Planning Inspectorate, 2022), and based on the receiving environment, expected parameters of the Project (Volume 1, Chapter 3 (Document Reference 6.1.3)), and expected scale of impact/potential for a pathway for effect on the environment, no impacts have been scoped out of the assessment.
85. The Scoping Opinion confirmed that a 'detailed assessment' of the potential for 'additional steaming to alternative fishing grounds for vessels that would otherwise fish within the Project area was not required (see Table 14.2), but for completeness and in response to the NFFO request, this potential impact has been fully considered.

86. Where relevant, assessment of impacts in the array area and offshore ECC are presented separately to reflect both the presence of different fishing fleets active across these two areas, and the different nature of impacts associated with WTG and foundation installation and operation, and subsea cable installation and operation.

14.5.2 Realistic Worst Case Scenario

87. This section identifies the Maximum Design Scenario (MDS) upon which the commercial fisheries impact assessment is based. The assessment of the MDS for each receptor establishes the maximum potential adverse impact and as a result impacts of greater adverse significance would not arise should any other development scenario (as described in Volume 1, Chapter 3 (Document Reference 6.1.3)) to that assessed within this Chapter be taken forward in the final scheme design.
88. The design parameters that have been identified to be relevant to commercial fisheries are outlined in Table 14.5 below and are in line with the Project design envelope (Volume 1, Chapter 3 (Document Reference 6.1.3)).

Table 14.5: Maximum design scenario for commercial fisheries for the Project alone

Potential effect	Maximum design scenario assessed	Justification
Construction		
Impact 1: Reduction in access to, or exclusion from established fishing grounds	<u>Total temporary reduction:</u> Construction duration: 3 years Seabed preparation: ▪ Boulder clearance area: 14 km^2 (array area) and 6 km^2 (offshore ECC) ▪ Sandwave clearance area: 11.9 km^2 (array area) and 4.3 km^2 (offshore ECC) ▪ Burial of up to 380 km of inter-array cables: maximum seabed disturbance of 11.5km^2 ▪ Burial of up to 440 km of export cables: maximum seabed disturbance of 7.92 km^2 ▪ Burial of up to 125 km of interlink cables: maximum seabed disturbance of 3.8 km^2 ▪ Seabed preparation for foundations: 1.3km^2 Safety Zones: ▪ 500m Safety Zones around construction activities = 0.79km^2 per structure under construction at any one time	This represents the maximum duration and extent of fishing exclusion throughout the construction phase and hence the greatest potential to restrict access to fishing grounds. The construction footprint comprises the full permanent seabed area of structures, scour protection, cable crossings and cable protection plus the temporary footprint of preparatory works including seabed preparation, sandwave clearance and boulder clearance. The impact area also incorporates Safety Zones around major activities. It is important to note that the temporal aspect of temporary works will not apply in full throughout the 3-year offshore construction phase, as activities will be completed sequentially.

Potential effect	Maximum design scenario assessed	Justification
	▪ 50m Safety Zones around incomplete structures = 7,854m^2 per partially constructed structure at any one time ▪ Roaming 500m safe passing distance for mobile installation vessels, which may, in exceptional circumstances, be increased to 1,000m dependant on the nature of the installation works ▪ Construction buoyage deployed around the maximum extent of the array area. <u>Total permanent reduction:</u> ▪ Wind turbine generator footprint, based on 100 WTGs, 50% with gravity base structure foundations and 50% jackets with suction buckets, including scour protection: 1,025,000m^2 ▪ Offshore substation footprint, based on four offshore transformer substations, one accommodation platform and two offshore reactive compensation platforms with jacket suction bucket foundations, including scour protection: 137,200m^2 ▪ Artificial Nesting Structure (ANS) footprint, based on two ANS with gravity base foundations, including scour protection: 12,300 m^2 ▪ Maximum rock protection for inter-array cables: 1,030,357 m^2	

Potential effect	Maximum design scenario assessed	Justification
	▪ Maximum rock protection for export cables: 1,229,510 m^2 ▪ Maximum rock protection for interlink cables: 278,438 m^2 ▪ Maximum rock protection for all cable crossings: 672,000 m^2 ▪ Creation of biogenic reef within the identified biogenic reef areas	
Impact 2: Displacement leading to gear conflict and increased fishing pressure on adjacent grounds	As for 'Reduction in access to, or exclusion from established fishing grounds' (see above).	This represents the maximum duration and extent of fishing exclusion throughout the construction phase and hence the greatest potential for displacement.
Impact 3: Disturbance of commercially important fish and shellfish resources leading to displacement or disruption of fishing activity	See fish and shellfish ecology maximum design scenario presented in Chapter 10: Fish and Shellfish Ecology (Document Reference 6.1.10).	The scenarios presented in fish and shellfish ecology provide for the greatest disturbance to fish and shellfish species and therefore the greatest knock-on effect to commercial fisheries. Importantly, this considers the impacts as a whole on commercially important species as considered in the maximum design scenario for the fish and shellfish chapter, rather than any one impact in particular.
Impact 4: Increased vessel traffic associated with the Project within fishing grounds leading to interference with fishing activity	Foundation installation for WTGs: ▪ 3 installation vessels (54 return trips) ▪ 10 support vessels (67 return trips) ▪ 8 transport vessels (400 return trips)	The maximum number of WTGs and associated infrastructure will lead to the highest level of construction activities and therefore highest level of construction vessel round trips.

Potential effect	Maximum design scenario assessed	Justification
	▪ 8 anchored transport vessels (400 return trips) WTG installation: ▪ 2 Jack Up Vessels (50 return trips) ▪ 18 support vessels (1,480 return trips) ▪ 10 transport vessels (150 return trips) Foundation installation for OSPs: ▪ 2 installation vessels (16 return trips) ▪ 12 support vessels (48 return trips) ▪ 4 transport vessels (32 return trips) OSP installation: ▪ 2 installation vessels (24 return trips) ▪ 12 support vessels (96 return trips) ▪ 4 transport vessels (48 return trips) Offshore export cable installation: ▪ 3 cable laying vessels (20 return trips) ▪ 3 cable jointing vessels (16 return trips) ▪ 3 cable burial vessels (16 return trips) ▪ 16 support vessels (1070 return trips) Inter-array and interlink cable installation: ▪ 3 installation vessels (24 return trips)	The maximum number of vessels transits and the maximum duration of the construction will result in the greatest potential for interference.

Potential effect	Maximum design scenario assessed	Justification
	▪ 2 cable burial vessels (18 return trips) ▪ 14 support vessels (1099 return trips) Up to 8 vessels (major installation and commissioning vessels) would be operating in a given 5 km^2 active construction area at any one time.	
Impact 5: Additional steaming to alternative fishing grounds for vessels that would otherwise fish within the Project area	As for 'Reduction in access to, or exclusion from established fishing grounds' (see above).	This represents the maximum duration and extent of fishing exclusion throughout the construction phase and hence the greatest potential for additional steaming to alternative grounds.
Operation and Maintenance		
Impact 6: Reduction in access to, or exclusion from established fishing grounds	<u>Total permanent reduction:</u> Duration: Operational design life of approximately 35 years. Wind turbine generator (WTG) footprint, based on 100 WTGs, 50% with gravity base foundations and 50% jackets with suction buckets, including scour protection: 1,025,000m^2 Offshore substation footprint, based on four offshore transformer substation, one accommodation platform and two offshore reactive compensation platforms with jacket suction bucket foundations, including scour protection: 137,200m^2	This 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. It comprises the maximum footprint of infrastructure on the seabed plus maintenance activities throughout the operational and maintenance phase and associated temporary safety zones. The smaller the spacing between WTGs the greater the potential for vessels to have restricted access to the site.

Potential effect	Maximum design scenario assessed	Justification
	Artificial Nesting Structure (ANS) footprint, based on two ANS with gravity base foundations, including scour protection: 12,300 m^2 Maximum rock protection for inter-array cables: 1,030,357 m^2 Maximum rock protection for export cables, based on 21% of length requiring protection: 1,239,510 m^2 Maximum rock protection for interlink cables, based on 19% of length requiring protection: 278,438 m^2 Creation of biogenic reef within the identified biogenic reef areas Minimum spacing between WTGs: 605m (WTG blade tip to WTG blade tip) <u>Temporary reduction from maintenance activities:</u> Number of JUVs in the Project area at any one time: 4 Seabed disturbance associated with inter-array cable repair/remediation event: 210,000m^2	The assessment assumes that fishing will resume around and between infrastructure within the Project where possible, with the exception of an assumed 50m operating distance from infrastructure, areas of cable protection, and safety zones around infrastructure undergoing major maintenance or replacement. Furthermore, the individual decisions made by skippers with their own perception of risk will determine the likelihood of whether their fishing will resume within the Project. Inclement weather will be a significant contributor to this risk perception. In addition, certain gear types including some forms of trawling and seine netting may not be practically deployed within the operational array.

Potential effect	Maximum design scenario assessed	Justification
	Seabed disturbance associated with export cable repair/remediation event: 155,000m^2 Seabed disturbance associated with inter-link cable repair/remediation event: 200,000 m^2 Safety Zones: ▪ 500m safety zones around manned offshore platforms and temporary 500m safety zones around WTGs and offshore platforms undergoing major maintenance.	
Impact 7: Displacement leading to gear conflict and increased fishing pressure on adjacent grounds	As for 'Reduction in access to, or exclusion from established fishing grounds' (see above).	This represents the maximum duration and extent of fishing exclusion throughout the operation and maintenance phase and hence the greatest potential for displacement.
Impact 8: Disturbance of commercially important fish and shellfish resources leading to displacement or disruption of fishing activity	See fish and shellfish ecology maximum design scenario presented in Chapter 10: Fish and Shellfish Ecology (Document Reference 6.1.10).	The scenarios presented in fish and shellfish ecology provide for the greatest disturbance to fish and shellfish species and therefore the greatest knock-on effect to commercial fisheries. Importantly, this considers the impacts as a whole on commercially important species as considered in the maximum design scenario for fish and shellfish chapter, rather than any one impact in particular.
Impact 9: Increased vessel traffic associated with the	Duration: Operational design life of approximately 35 years.	The maximum number of WTGs and associated infrastructure will lead to the highest level of

Potential effect	Maximum design scenario assessed	Justification
Project within fishing grounds leading to interference with fishing activity	Vessels in the Project area at any one time: ▪ 4 JUVs ▪ 2 Service Operation Vessels (SOVs) ▪ 12 supply vessels ▪ 10 Crew Transfer Vessels (CTVs) Up to 2,480 vessel return trips per year to Project area	operation and maintenance activities and therefore highest level of operation and maintenance vessel round trips.
Impact 10: Additional steaming to alternative fishing grounds for vessels that would otherwise fish within the Project area	As for 'Reduction in access to, or exclusion from established fishing grounds' (see above).	This represents the maximum duration and extent of fishing exclusion throughout the operation and maintenance phase and hence the greatest potential for additional steaming to alternative grounds.
Impact 11: Physical presence of infrastructure leading to gear snagging	As for 'Reduction in access to, or exclusion from established fishing grounds' (see above).	This represents the maximum potential for interactions between infrastructure and fishing gear.
Decommissioning		
Impact 12: Reduction in access to, or exclusion from established fishing grounds	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, noting that the physical presence of infrastructure leading to gear snagging is additionally relevant during decommissioning.	Decommissioning arrangements will be detailed in a Decommissioning Plan, which will be drawn up and agreed with the Department for Energy Security and Net Zero (DESNZ) prior to construction. Assessment is based upon decommissioning being likely to include removal of offshore structures above the seabed level, together
Impact 13: Displacement leading to gear conflict and increased fishing pressure on adjacent grounds		
Impact 14: Disturbance of commercially important fish		

Potential effect	Maximum design scenario assessed	Justification
and shellfish resources leading to displacement or disruption of fishing activity		with all subsea cables. Some or all of the subsea cables and cable protection may be left in situ if it is later judged that removal would lead to greater environmental impacts.
Impact 15: Increased vessel traffic associated with the Project within fishing grounds leading to interference with fishing activity		
Impact 16: Additional steaming to alternative fishing grounds for vessels that would otherwise fish within the Project area		
Impact 17: Physical presence of infrastructure leading to gear snagging		

14.5.3 Embedded Mitigation

89. Mitigation measures that were identified and adopted as part of the evolution of the project design (embedded into the project design) and that are relevant to commercial fisheries are listed in Table 14.6. General mitigation measures, which would apply to all parts of the project, are set out first. Thereafter mitigation measures that would apply specifically to commercial fisheries are described separately. The assessment of impacts presented in Section 14.7 take account of these measures.

Table 14.6: Embedded mitigation relating to commercial fisheries

Project phase	Mitigation measures embedded into the project design
General	
Project design	The Applicant has reduced the project design from that proposed during the scoping phase in order to reduce the potential impacts as far as practicable. The array area has been refined from 500 km^2 to an area of 436km^2. The number of export cables has been reduced from six to four. A commitment has been made to a maximum of 50 per cent of foundations utilising a gravity base option.
Marking and lighting	The Applicant is committed to marking and lighting the project in accordance with relevant industry guidance and as advised by relevant stakeholders including the MCA, Civil Aviation Authority (CAA) and Trinity House. The Applicant will also ensure the project is adequately marked on nautical charts. An aids to navigation management plan will be developed post consent.
Cable burial	Where possible, subsea cable burial will be the preferred option for cable protection. Cable burial will be informed by the cable burial risk assessment (CBRA) – which will take account of the presence of designated sites – and detailed within the Cable Specification and Installation Plan (CSIP). An outline CSIP has been prepared in support of the Application (document reference 8.5), which will be finalised post-consent.
Safety Zones	Application for safety zones around structures during construction and periods of major maintenance: - 500m around structures where construction is ongoing; - 50m around all structures prior to commissioning of the Project; and - 500m around structures where major maintenance is ongoing.
Dropped objects	Dropped objects will be reported and will be recovered where they pose a potential hazard to other marine users.
Commercial fisheries	
Fisheries liaison	The Applicant is committed to ongoing liaison with fishermen throughout all stages of the project, based upon FLOWW (2014, 2015) guidance and the following:

Project phase	Mitigation measures embedded into the project design
	▪ Appointment of a company Fisheries Liaison Officer (FLO) to maintain effective communications between the project and fishermen (a company FLO is already appointed and active); ▪ Appropriate liaison with relevant fishing interests to ensure that they are fully informed of development planning and any offshore activities and works; ▪ Timely issue of notifications including Notice to Mariners (NtMs), Kingfisher Bulletin notifications and other navigational warnings to the fishing community to provide advance warning of project activities and associated Safety Zones and advisory safety distances; and ▪ Development, prior to construction, of a Fisheries Liaison and Co-existence Plan (FLCP), setting out in detail the planned approach to fisheries liaison and means of delivering any other relevant mitigation measures. A draft of this plan is available in document 8.22.

14.6 Assessment Methodology

90. The project-wide generic approach to assessment is set out in Volume 1, Chapter 5: EIA Methodology (Document Reference 6.1.5). The assessment methodology for commercial fisheries is consistent with the approach, but additionally is informed by the topic-specific guidance listed in Section 14.2.

14.6.1 Assessment Criteria and Assessment of Significance

91. The method for determining the significance of effects is a two-stage process that involves defining the sensitivity of the receptors and the magnitude of the impacts. This section describes the criteria applied in this chapter to assign values to the sensitivity of receptors and the magnitude of potential impacts.
92. In assessing the magnitude of the impact, the value and vulnerability of the receptor, i.e., the fishing fleet under assessment, together with the reversibility of the impact, are considered. Due to the range in scale, value (in terms of both landings and income/profit) and operational practises, within the commercial fishing fleets assessed, specific economic criteria were not set for defining value within the categories of high, medium or low. Instead, these classifications were based on judgement informed by the baseline characterisation and consultation with the industry. Magnitude of impact is defined in Table 14.7. The definitions employed in assigning receptor sensitivity are provided in Table 14.8.
93. The significance of the effect upon commercial fisheries is determined by correlating the magnitude of the impact and the sensitivity of the receptor. The method employed for this assessment is presented in
94. Table 14.9.

Table 14.7: Impact magnitude definitions

Magnitude	Description/reason
High (adverse)	Impact is of long-term duration (e.g., greater than eight years duration) and/or is of extended physical extent; and 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 project area); ▪ substantial loss of ability to carry on fishing activities (e.g., substantial proportion of effort within project area); and ▪ substantial loss of economic value of commercial landings, that is nationally/regionally significant.
High (beneficial)	Impact is expected to result in one or more of the following: ▪ large scale or major improvement of resource quality, measurable against biomass reference points; ▪ extensive restoration or enhancement of habitats supporting commercial fisheries resources; and ▪ substantial gain of economic value of commercial landings.
Medium (adverse)	Impact is of medium-term duration (e.g., more than two to three years and less than eight years) and/or is of moderate physical extent; and 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 project area); ▪ partial loss of ability to carry on fishing activities (e.g., moderate reduction of fishing effort within project area); and ▪ partial loss of economic value of commercial landings, that is locally significant.
Medium (beneficial)	Impact is expected to result in one or more of the following: ▪ moderate improvement of resource quality; ▪ moderate restoration or enhancement of habitats supporting commercial fisheries resources; and ▪ partial gain of economic value of commercial landings.
Low (adverse)	Impact is of short-term duration (e.g., less than two to three years) and/or is of limited physical extent; and 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 project area); ▪ minor loss of ability to carry on fishing activities (e.g., minor reduction of fishing effort within project area); and ▪ minor loss of economic value of commercial landings that is not locally significant.
Low (beneficial)	Impact is expected to result in one or more of the following:

Magnitude	Description/reason
	▪ minor benefit to or minor improvement of resource quality; ▪ minor restoration or enhancement of habitats supporting commercial fisheries resources; and ▪ minor gain of economic value of commercial landings.
Negligible (adverse)	Impact is of very short-term duration (e.g., less than one year) and/or physical extent of impact is negligible; and Impact is expected to result in one or more of the following: ▪ slight loss of target fish or shellfish biological resource (e.g., slight loss of resource within project area); ▪ slight loss of ability to carry on fishing activities (e.g., slight loss of fishing effort within project area); and ▪ minimal loss of economic value of commercial landings.
Negligible (beneficial)	Impact is expected to result in one or more of the following: ▪ very minor benefit to or very minor improvement of resource quality; ▪ very minor restoration or enhancement of habitats supporting commercial fisheries resources; and ▪ minimal gain of economic value of commercial landings.

Table 14.8: Sensitivity/importance of the environment

Receptor sensitivity/importance	Definition
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.
Medium	Receptor is generally vulnerable to impacts that may arise from the project and recoverability is slow and/or costly. And/or: Low levels of alternative fishing grounds are available and/or fishing fleet has low operational range.
Low	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.
Negligible	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.

Table 14.9: Matrix to determine effect significance

Sensitivity of receptor	Magnitude of impact: *Negligible*	*Low*	*Medium*	*High*
Negligible	Negligible (Not significant)	Negligible (Not significant)	Minor (Not significant)	Minor (Not significant)
Low	Negligible (Not significant)	Minor (Not significant)	Minor (Not significant)	Moderate (Significant)
Medium	Minor (Not significant)	Minor (Not significant)	Moderate (Significant)	Major (Significant)
High	Minor (Not significant)	Moderate (Significant)	Major (Significant)	Major (Significant)

14.6.2 Assumptions and Limitations

95. Limitations associated with the data used to inform the description of the existing environment are described in Section 14.4 above, and further in the Commercial Fisheries Technical Baseline (Document Reference 6.3.14.1). As explained above, these 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 form 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 14.7.

96. The Project is in development and the final design of the project is not yet defined (as is standard practice within the industry for projects at this stage of development). To manage this uncertainty and allow a robust impact assessment to be undertaken, the assessment presented in this chapter is based on a maximum design scenario for the Project. Through adoption of this maximum (or 'realistic worst case') scenario, there is confidence that the maximum potential adverse impact has been assessed, and as a result impacts of greater adverse significance would not arise should any other development scenario to that assessed within this Chapter be taken forward in the final scheme design.

14.7 Impact Assessment

14.7.1 Construction

97. This section presents the assessment of impacts arising from the construction phase of the Project.

98. Whilst potential reduced access and displacement impacts are assessed separately for the array area and offshore ECC in the text below (in response to the presence of different fishing fleets active across these two areas, and the different nature of impacts associated with WTG and foundation installation and operation, and subsea cable installation and operation), it is not anticipated that impacts across these areas would interact in such a way as to result in a combined impact (i.e. array area impacts plus offshore ECC impacts) of greater significance than identified in each assessment under Impact headings 1(A), 1(B), 2(A) and 2(B). The assessment of effects upon fishing fleets is precautionary and takes into account where a single fleet may be impacted by both works and infrastructure in the array area and offshore ECC (inclusive of ANS areas and biogenic reef creation, with the latter possibly involving deployment of cultch, a growing medium for mussels or oyster).

Impact 1 (A): Array area construction activities and physical presence of constructed windfarm infrastructure leading to reduction in access to, or exclusion from established fishing grounds

99. During construction of the Project, commercial fisheries will be prevented from fishing where construction activities are taking place (i.e. where construction vessels and partially installed infrastructure are present, and within the footprint of Safety Zones of 500 m diameter, which will be sought around infrastructure under construction). The total offshore construction duration will be approximately three years, with a number/range of construction activities being undertaken simultaneously across the site. As noted in Table 14.6 the area in which construction will take place, and the seabed footprint of installed infrastructure, has been considerably reduced in response to stakeholder feedback received during the scoping phase.

Magnitude of Impact

100. This impact will lead to a localised loss of access to fishing grounds and the fish and shellfish resources within these grounds for a range of fishing opportunities during the period of construction, which will directly affect fleets over a short-term duration (i.e., less than 2-3 years). The impact is predicted to be intermittent with localised exclusion surrounding construction activities.

101. The impact is of relevance to national and international fishing fleets and is described below on a fishery-by-fishery basis. Since UK beam trawl, netting and hooked gear/ longline fleets are not active in the array area, they are not considered under Impact 1(A).

102. UK potting fishery: The array area and ANS areas overlap the southernmost extent of significant shellfish grounds routinely targeted by UK vessels. Key species targeted include brown crab, whelk and lobster. As an indication of this, the proportion of species landed by pots and traps from ICES rectangle 36F1, within which the majority of the array area is located, is over 98%. Average annual (2017 to 2022) landings of brown crab from this rectangle are high and valued at £1.9 million, with equivalent values for whelk of £257,000 and lobster of approximately £289,000. Noting that the array area overlaps with approximately 6% of this rectangle, this equates to a pro-rata value of approximately £114,000 for brown crab landings (based on uniform landings across the entire rectangles). While such a simplistic calculation brings higher level of uncertainty to the resulting figure, it does demonstrate the potential opportunity within the array area. Equivalent values for whelk are £15,420 and for lobster are £17,340.

103. The UK potting fleet operating outside the 12nm limit is comprised entirely of over 10 m length vessels. Whilst these vessels do have some opportunity to fish in alternative areas, grounds to the north are already heavily targeted.

104. During construction, potting vessels will be required to remove pots from areas under construction and either relocate or bring to shore depending on available grounds and fishing preferences. Potting fishermen will therefore experience loss of earnings for the time taken to relocate gear, and (potentially) a loss of earnings associated with not being able to fish the specific grounds under construction (e.g., if alternative grounds are either not available, or not as productive). Potting typically involves a number of fleets of pots being deployed across a range of areas, and while it is highly unlikely that 100% of pots deployed by a single vessel will be impacted at any one time, it is understood that specific potting grounds may be targeted by specific operators. In this case, individual fishing businesses that routinely target the site will be impacted to a higher extent and this is accounted for within the assessment.

105. The impact on the UK potting fleet is predicted to be of regional spatial extent, short-term duration and intermittent. It is predicted that the impact will affect the receptor directly and result in a partial loss of ability to carry on fishing activity in the array area. The magnitude is considered to be medium adverse for the UK potting fleet.

106. UK dredge fishery: The array area and ANS areas lie to the south of important scallop grounds. Average annual (2017 to 2022) landings of scallop from this ICES rectangle 36F1 are £42,000 and show significant annual variation, with a landed value in 2021 of £650. VMS data indicates that the array area is not routinely targeted by the UK scallop dredge fleet and that scallop landed from ICES rectangle 36F1 are likely to have been caught to the north-east of the Project boundaries.

107. Where the impact may affect the receptor, it will be direct, of regional spatial extent, short-term duration and intermittent resulting in a potential minor loss of ability to carry on fishing activity. The magnitude of impact is considered to be low adverse for the UK dredge fleet.

108. UK demersal seine fishery: The UK demersal seine fleet is understood to be active across wide areas of the southern North Sea and English Channel, targeting whiting, mullets and squid. Landings by this fishery from ICES rectangle 36F1 occurred only within 2021, reflecting the recent emergence of the fleet, and were valued at £7,000. No landings by demersal seine were recorded in 2022 from this rectangle. Landings are notably more significant in other areas of the southern North Sea, indicating that the array area is not located in a key fishing area for this fleet. Seine netting activity typically takes place over soft sediments to avoid gear damage and is not considered likely to target the relatively coarser ground present in the array area.

109. Where the impact may affect the receptor, it will be direct, of regional spatial extent, short-term duration and intermittent. The magnitude of impact is considered to be low adverse for the UK demersal seine fleet.

110. Dutch beam trawl fishery: The array area and ANS areas are located inshore of important EU beam trawl grounds, which cover large areas of the southern North Sea. Within ICES rectangle 36F1 landings data indicates relatively low volumes of catches of demersal species – primarily sole and plaice – by Dutch beam trawlers (averaging 195 tonnes annually between 2012 and 2016). VMS data indicates that the array area is not targeted by EU beam trawlers.

111. Where the impact may affect the receptor, it will be direct, of regional spatial extent, short-term duration and intermittent. The magnitude of impact is considered to be negligible adverse for the Dutch beam trawl fleet, with the potential for a slight loss of opportunity to carry on fishing activity.

112. Belgian beam trawl fishery: The array area and ANS areas are located inshore of important EU beam trawl grounds, which cover large areas of the southern North Sea. Within ICES rectangle 36F1 landings data indicates relatively low volumes of catches of demersal species – primarily sole and plaice – by Belgian beam trawlers (averaging 54 tonnes annually between 2012 and 2016). VMS data indicates that the array area is not targeted by EU beam trawlers.

113. Where the impact may affect the receptor, it will be direct, of regional spatial extent, short-term duration and intermittent. The magnitude of impact is considered to be negligible adverse for the Belgian beam trawl fleet.

114. French demersal otter trawl fishery: The array area and ANS areas are located outside of important EU otter trawl grounds, which cover large areas of the southern North Sea. Within ICES rectangle 36F1 landings data indicates very low volumes of catches of demersal species by French otter trawlers (averaging 6 tonnes annually between 2012 and 2016). VMS data indicates that the array area is not targeted by EU demersal otter trawlers.

115. Where the impact may affect the receptor, it will be direct, of regional spatial extent, short-term duration and intermittent. The magnitude of impact is considered to be negligible adverse for the French otter trawl fleet.

116. EU pelagic fishery: Any activity by pelagic vessels within the array area is highly likely to be a sporadic, transitory event, as corroborated by EU landings statistics, which show occasional landings by EU pelagic trawlers. Highly mobile pelagic species, that move in shoals and are not associated with specific seabed habitats, are assumed to be available to catch across large areas i.e., if a shoal of mackerel cannot be caught within the Project array area, this shoal is expected to move to an area where they can be caught. Therefore, while the access to the water column within the Project array area may be affected; the opportunity to catch pelagic fish is not lost. The magnitude of impact is considered to be negligible adverse for the EU pelagic fleet.

Sensitivity of Receptor

117. The UK potting fleet active in the array area operates across relatively distinct areas of ground in areas that are already heavily exploited and are therefore more sensitive to disruption. The UK potting fleet is deemed to be of medium vulnerability and medium recoverability across the Project array area. The sensitivity of the receptor is therefore, considered to be medium.

118. The UK dredge fleet typically operates outside of the array area and on this basis is deemed to be of low vulnerability and medium recoverability, with receptor sensitivity considered to be low.

119. The UK demersal seine fleet and EU beam and otter trawl fleets are highly mobile and operate across large areas of the North Sea and beyond, with data indicating that the array area is not routinely targeted by them. Given adequate notification, it is expected that these vessels will be in a position to avoid construction areas. These fleets are considered to have a medium to large operational range; medium to high levels of alternative fishing grounds; and are deemed to be of low vulnerability and high recoverability. The sensitivity of these receptors is therefore, considered to be low.

120. All pelagic gear fleets are considered to have an extensive operational range, be highly adaptive and resilient to change. The sensitivity of the pelagic fleets is considered to be negligible.

Significance of Residual Effect

121. Embedded mitigation measures include advance notification of planned construction activities to fishermen and ongoing liaison throughout construction. Taking account of these measures, the residual effect on each fishery is set out immediately below, noting that the effect in all cases will be direct and temporary.

122. UK potting fishery: Overall, it is predicted that the sensitivity of the receptor is medium, and the impact magnitude is medium. The effect is of **moderate adverse** significance, which is potentially significant in EIA terms. In response to this, and specific to the UK potting fleet where there is a significant residual impact, further mitigation has been identified and is presented below.

123. UK dredge fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the magnitude of impact is low. The effect is of **minor adverse** significance, which is not significant in EIA terms.

124. UK demersal seine fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the magnitude of impact is low. The effect is of **minor adverse** significance, which is not significant in EIA terms.

125. Dutch beam trawl fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the magnitude of impact is negligible. The effect is of **negligible adverse** significance, which is not significant in EIA terms.

126. Belgian beam trawl fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the magnitude of impact is negligible. The effect is of **negligible adverse** significance, which is not significant in EIA terms.

127. French demersal otter trawl fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the magnitude of impact is negligible. The effect is of **negligible adverse** significance, which is not significant in EIA terms.

128. EU pelagic fishery: Overall, it is predicted that the sensitivity of the receptor is negligible, and the magnitude of impact is negligible. The effect is of **negligible adverse** significance, which is not significant in EIA terms.

Further Mitigation

129. UK potting fishery: Specific to the UK potting fleet where there is a significant impact, the Outline Fisheries Liaison and Coexistence Plan (FLCP) (see document 8.22) will explore options to encourage co-existence and further mitigate the effect, including establishment of cooperation agreements between the Applicant and fishers and associated justifiable disturbance payments made to fishers where appropriately evidenced. With respect to any cooperation agreements and associated payments, the procedures as outlined in the FLOWW guidance documents (2014 and 2015), will be followed.

130. Through the application of the FLCP, together with justifiable disturbance payments where relevant, the residual effect will, therefore, be of **minor adverse** significance, which is not significant in EIA terms.

Impact 1 (B): Offshore ECC construction activities and physical presence of constructed windfarm infrastructure leading to reduction in access to, or exclusion from established fishing grounds

131. Fishing activity will be locally and temporarily excluded at the location of construction owing to the presence of construction vessels, construction operations and the need to observe The Convention on the International Regulations for Preventing Collisions at Sea, 1972 (COLREGS).

Magnitude of Impact

132. This impact will lead to a loss of access to fishing grounds and the fish and shellfish resources within these grounds for a range of fishing opportunities during the construction activities, which will directly affect various fishing fleets over a short-term duration. The impact is predicted to be intermittent with localised exclusion surrounding construction activities.

133. The impact is of relevance to national and international fishing fleets and is described below on a fishery-by-fishery basis. Since the EU pelagic trawl fleet is not active in the offshore ECC, it is not considered under Impact 1(B).

134. UK potting fishery: The offshore ECC and biogenic reef restoration areas overlap significant shellfish grounds routinely targeted by UK vessels. Key species targeted include brown crab, whelk and lobster. The outermost portion of the offshore ECC where it joins the array area is located within ICES rectangle 35F1, where average annual (2017 to 2022) landings of shellfish from pots and traps are valued at £1.7 million. The inshore portion of the offshore ECC is located within ICES rectangle 35F0, where the equivalent value is £1.1 million. Noting that the offshore ECC overlaps with approximately 2% of these two rectangles, this equates to a pro-rata value of approximately £58,000 (based on uniform landings across the entire rectangles). While such a simplistic calculation brings a higher level of uncertainty to the resulting figure, it does demonstrate the potential opportunity within the offshore ECC.

135. The UK potting fleet operating in the vicinity of the offshore ECC is comprised of smaller inshore vessels (mainly under 15 m length) targeting inshore grounds and larger vessels targeting offshore grounds along the outermost portion of the offshore ECC. Whilst these vessels do have some opportunity to fish in alternative areas, adjacent grounds are understood to be already heavily targeted.

136. As described for the array area, during construction, potting vessels will be required to remove pots from areas under construction and either relocate or bring to shore depending on available grounds and fishing preferences. Potting fishermen will therefore experience loss of earnings for the time taken to relocate gear, and (potentially) a loss of earnings associated with not being able to fish the specific grounds under construction (e.g., if alternative grounds are either not available, or not as productive). Potting typically involves a number of fleets of pots being deployed across a range of areas, and while it is highly unlikely that 100% of pots deployed by a single vessel will be impacted at any one time, it is understood that specific potting grounds may be targeted by specific operators. In this case, individual fishing businesses that routinely target the site will be impacted to a higher extent and this is accounted for within the assessment.

137. The impact on the UK potting fleet is predicted to be of regional spatial extent, short-term duration and intermittent. It is predicted that the impact will affect the receptor directly. The magnitude is considered to be medium adverse for the UK potting fleet.

138. UK dredge fishery: The offshore ECC and biogenic reef restoration areas lie to the south of important scallop grounds. Average annual (2017 to 2022) landings of scallop from ICES rectangle 35F1 were valued at £660, with no landings recorded in 2021 or 2022. The equivalent value from rectangle 35F0 was £8,000, with no landings recorded in 2020 or 2022 and landings at a value of £190 recorded in 2021. VMS data indicates that the offshore ECC is not routinely targeted by the UK scallop dredge fleet and that scallop landed from ICES rectangle 35F0 are likely to have been caught to the north of the of Project boundaries.

139. Where the impact may affect the receptor, it will be direct, of regional spatial extent, short-term duration and intermittent. The magnitude of impact is considered to be low adverse for the UK dredge fleet.

140. UK beam trawl fishery: The UK beam trawl fishery targeting brown shrimp is active in ICES rectangles 35F1 and 35F0. Activity is focused within the 6nm limit and therefore within rectangle 35F0, where the average annual (2017 to 2022) landings by this fleet were valued at £293,000. There has been a notable decline in landings across 2019 to 2022, following relative peaks in 2017 and 2018. Vessels engaged in the brown shrimp beam trawl fishery are over 10m length. VMS data Indicates that the nearshore portion of the offshore ECC may overlap with fleet grounds, noting that key grounds targeted by this fleet are located to the south in The Wash.

141. The impact on the UK beam trawl fleet is predicted to be of regional spatial extent, short-term duration and intermittent. It is predicted that the impact will affect the receptor directly. The magnitude is considered to be low adverse for the UK beam trawl fleet.

142. UK demersal seine fishery: The UK demersal seine fleet is understood to be active across wide areas of the southern North Sea and English Channel, targeting whiting, mullets and squid. Landings by this fishery from ICES rectangle 35F1 occurred only within 2021 and 2022, reflecting the recent emergence of the fleet, and were valued at £6,500 and £7,500 respectively. Landings are notably more significant in other areas of the southern North Sea, indicating that the offshore ECC is not located in a key fishing area for this fleet.

143. Where the impact may affect the receptor, it will be direct, of regional spatial extent, short-term duration and intermittent. The magnitude of impact is considered to be low adverse for the UK demersal seine fleet.

144. UK netting fishery: Landings data indicates low levels of landings from the inshore netting fleet from ICES rectangle 35F1, with vessels landing sole, herring, rays and bass. The average annual (2017 to 2022) landings by this fleet from rectangle 35F1 were valued at £930, with no landings recorded from rectangle 35F0. Limited spatial data is available for netting activity, though landings totals suggest that the offshore ECC is not located within important netting grounds.

145. Where the impact may affect the receptor, it will be direct, of regional spatial extent, short-term duration and intermittent. The magnitude of impact is considered to be negligible adverse for the UK netting fleet.

146. UK hooked gear/longline fishery: Landings data indicates low levels of landings from the hooked gear/longline fleet from ICES rectangle 35F1, with vessels landing sole, herring, rays and bass. The average annual (2017 to 2022) landings by this fleet from rectangle 35F1 were valued at £800, with very limited landings recorded from rectangle 35F0. Limited spatial data is available for hooked gear/longline activity, though landings totals suggest that the offshore ECC is not located within important fishing grounds.

147. Where the impact may affect the receptor, it will be direct, of regional spatial extent, short-term duration and intermittent. The magnitude of impact is considered to be negligible adverse for the UK hooked gear/ longline fleet.

148. Dutch beam trawl fishery: The offshore ECC and biogenic reef restoration areas are located inshore of important EU beam trawl grounds, which cover large areas of the southern North Sea. Within ICES rectangles 35F0 and 35F1 landings data indicates relatively low volumes of catches of demersal species – primarily sole and plaice – by Dutch beam trawlers (averaging 85 tonnes annually between 2012 and 2016). VMS data indicates that the offshore ECC is not targeted by EU beam trawlers.

149. Where the impact may affect the receptor, it will be direct, of regional spatial extent, short-term duration and intermittent. The magnitude of impact is considered to be negligible adverse for the Dutch beam trawl fleet.

150. Belgian beam trawl fishery: The offshore ECC and biogenic reef restoration areas are located inshore of important EU beam trawl grounds, which cover large areas of the southern North Sea. Within ICES rectangles 35F0 and 35F1 landings data indicates relatively low volumes of catches of demersal species – primarily sole and plaice – by Belgian beam trawlers (averaging 4 tonnes annually between 2012 and 2016). VMS data indicates that the offshore ECC is not targeted by EU beam trawlers.

151. Where the impact may affect the receptor, it will be direct, of regional spatial extent, short-term duration and intermittent. The magnitude of impact is considered to be negligible adverse for the Belgian beam trawl fleet.

152. French demersal otter trawl fishery: The offshore ECC and biogenic reef restoration areas are located outside of important EU otter trawl grounds, which cover large areas of the southern North Sea. Within ICES rectangles 35F0 and 35F1 landings data indicates landings data indicates low volumes of catches of demersal species by French otter trawlers (averaging 60 tonnes annually between 2012 and 2016). VMS data indicates that the central portion of the offshore ECC may very occasionally be targeted by EU demersal otter trawlers active in grounds immediately to the north.

153. Where the impact may affect the receptor, it will be direct, of regional spatial extent, short-term duration and intermittent. The magnitude of impact is considered to be negligible adverse for the French otter trawl fleet.

Sensitivity of Receptor

154. The sensitivity of receptors is broadly as described in paragraphs 117 to 120.

155. The UK potting fleet active in the offshore ECC operates across relatively distinct areas of ground in areas that are already heavily exploited and are therefore more sensitive to disruption. The UK potting fleet is deemed to be of medium vulnerability and medium recoverability across the offshore ECC. The sensitivity of the receptor is therefore, considered to be medium.

156. The UK dredge fleet typically operates outside of the offshore ECC and on this basis is deemed to be of low vulnerability and medium recoverability, with receptor sensitivity considered to be low.

157. The UK beam trawl fleet active in the nearshore offshore ECC operates across relatively distinct areas of ground in areas that are already heavily exploited and are therefore more sensitive to disruption. The UK beam trawl fleet is deemed to be of medium vulnerability and medium recoverability across the offshore ECC. The sensitivity of the receptor is therefore, considered to be medium.

158. The UK demersal seine fleet and EU beam and otter trawl fleets are highly mobile and operate across large areas of the North Sea and beyond, with data indicating that the array area is not routinely targeted by them. Given adequate notification, it is expected that these vessels will be in a position to avoid construction areas. These fleets are considered to have a medium to large operational range; medium to high levels of alternative fishing grounds; and are deemed to be of low vulnerability and high recoverability. The sensitivity of these receptors is therefore, considered to be low.

159. The UK netting and hooked gear/ longline fleets do not appear to be notably active in the offshore ECC and have some ability to target a variety of alternative local grounds. On this basis these fleets are deemed to be of low vulnerability and medium recoverability, with receptor sensitivity considered to be low.

Significance of Residual Effect

160. Embedded mitigation measures include advance notification of planned construction activities to fishermen and ongoing liaison throughout construction. Taking account of these measures, the residual effect on each fishery is set out immediately below, noting that the effect in all cases will be direct and temporary.

161. UK potting fishery: Overall, it is predicted that the sensitivity of the receptor is medium, and the impact magnitude is medium. The effect is of **moderate adverse** significance, which is potentially significant in EIA terms. In response to this, and specific to the UK potting fleet where there is a significant residual impact, further mitigation has been identified and is presented below.

162. UK dredge fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the magnitude of impact is low. The effect is of **minor adverse** significance, which is not significant in EIA terms.

163. UK beam trawl fishery: Overall, it is predicted that the sensitivity of the receptor is medium, and the magnitude of impact is low. The effect is of **minor adverse** significance, which is not significant in EIA terms.

164. UK demersal seine fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the magnitude of impact is low. The effect is of **minor adverse** significance, which is not significant in EIA terms.

165. UK netting fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the magnitude of impact is negligible. The effect is of **negligible adverse** significance, which is not significant in EIA terms.

166. UK hooked gear/longline fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the magnitude of impact is negligible. The effect is of **negligible adverse** significance, which is not significant in EIA terms.

167. Dutch beam trawl fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the magnitude of impact is negligible. The effect is of **negligible adverse** significance, which is not significant in EIA terms.

168. Belgian beam trawl fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the magnitude of impact is negligible. The effect is of **negligible adverse** significance, which is not significant in EIA terms.

169. French demersal otter trawl fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the magnitude of impact is negligible. The effect is of **negligible adverse** significance, which is not significant in EIA terms.

Further Mitigation

170. UK potting fishery: Specific to the UK potting fleet where there is a significant impact, the Outline Fisheries Liaison and Coexistence Plan (FLCP) (see document 8.22) will explore options to encourage co-existence and further mitigate the effect, including establishment of cooperation agreements between the Applicant and fishers and associated justifiable disturbance payments made to fishers where appropriately evidenced. With respect to any cooperation agreements and associated payments, the procedures as outlined in the FLOWW guidance documents (2014 and 2015), will be followed.

171. Through the application of the FLCP, together with justifiable disturbance payments where relevant, the residual effect will, therefore, be of **minor adverse** significance, which is not significant in EIA terms.

Impact 2 (A): Displacement from array area leading to gear conflict and increased fishing pressure on adjacent grounds

172. Localised exclusion from fishing grounds during construction in the Project array may lead to temporary increases in fishing effort in other areas that may already be exploited thereby leading to gear conflict and increased fishing pressure on adjacent grounds.

173. In terms of the area impacted by construction activities within the Project array area, in total a maximum of 20km^2 of seabed will be temporarily disturbed during construction, with a permanent reduction of 4.4km^2 of seabed during construction. In addition, there will be 500m safety distance around infrastructure under construction (equating to 0.79 km^2 per structure) and 500m safe passing distance around construction vessels (equating to 0.79 km^2 per vessel).

Magnitude of Impact

174. The impact is predicted to be of regional spatial extent, short-term duration and intermittent. The impact is of relevance to national and international fishing fleets and is described below on a fishery-by-fishery basis.

175. UK potting fishery: Conflict over diminished grounds may occur if displaced vessels operating mobile gear (e.g., beam trawl) explore grounds traditionally fished by potters; and/or displaced potting gear is relocated into actively fished potting grounds. Displacement of mobile gear may therefore increase the risk of interaction with potting gear. For mobile gear, displacement could be expected to be focused on alternative established grounds both in the vicinity of the array area and throughout the southern North Sea, with limited displacement onto potting grounds.

176. When considering the impact of potters being displaced from the array area 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; or

- Alternative fishing grounds are not available as adjacent areas are already being fished by potters, in which case the physical presence of gear already on the ground may be expected to limit the level of displacement and conflict. While there remains potential for gear conflicts and increased fishing pressure to arise, appropriately mitigated exclusion impacts will limit this.

177. Taking all of these aspects into consideration, the magnitude of the displacement impact is assessed to be medium adverse for UK potters.

178. UK dredge fishery: Displacement from the array area is not expected to affect the dredge fishery, which has a wide operational range, since it is understood to predominantly take place on grounds to the north of the Project. The magnitude of the displacement impact is assessed to be low adverse for UK scallopers.

179. UK demersal seine fishery: Displacement from the array area is not expected to affect the demersal seine fishery, which has a wide operational range and key grounds located to the south of the Project in the southern North Sea. The magnitude of the displacement impact is assessed to be low adverse for the UK demersal seine fleet.

180. All EU trawl fisheries: Displacement from the array area is not expected to affect these fisheries since key fishing grounds and therefore activity is located outside of Project boundaries. The magnitude of displacement is assessed to be negligible adverse.

Sensitivity of Receptor

181. The sensitivity of the fleets is as described in paragraphs 117 to 120 and is medium for the UK potting fleet and low for all other fleets except for the EU pelagic trawl fleet, which has negligible sensitivity.

Significance of Residual Effect

182. UK potting fleet: Overall, it is predicted that the sensitivity of the receptor is medium, the value is medium and the magnitude is medium. The effect is of **moderate adverse** significance, which is significant in EIA terms. In response to this, and specific to the UK potting fleet where there is a significant residual impact, further mitigation has been identified and is presented below.

183. UK dredge fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the magnitude of impact is low. The effect is of **minor adverse** significance, which is not significant in EIA terms.

184. UK demersal seine fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the magnitude of impact is low. The effect is of **minor adverse** significance, which is not significant in EIA terms.

185. Dutch beam trawl fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the magnitude of impact is negligible. The effect is of **negligible adverse** significance, which is not significant in EIA terms.

186. Belgian beam trawl fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the magnitude of impact is negligible. The effect is of **negligible adverse** significance, which is not significant in EIA terms.

187. French demersal otter trawl fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the magnitude of impact is negligible. The effect is of **negligible adverse** significance, which is not significant in EIA terms.

188. EU pelagic fishery: Overall, it is predicted that the sensitivity of the receptor is negligible, and the magnitude of impact is negligible. The effect is of **negligible adverse** significance, which is not significant in EIA terms.

Further Mitigation

189. UK potting fleet: mitigation described in paragraph 130 details the approach to ascertain justifiable disruption and co-operation agreements between the Applicant and commercial fishing vessel owners on an individual basis. To mitigate this displacement effect, emphasis is focused on ensuring that the effect of reduced access is mitigated by removing that effort to ensure that it is not moved or displaced elsewhere. This can be delivered in a number of ways, such as the requirement for fishing gear that is subject to a cooperation agreement to be wet or dry stored (i.e., not actively fished), thereby minimising the displacement effect.

190. Through the application of cooperation agreements that appropriately mitigate reduced access by removing fishing effort to ensure displacement does not occur, the residual impacts will be of **minor adverse** significance, which is not significant in EIA terms.

Impact 2 (B): Displacement from offshore export cable corridor leading to gear conflict and increased fishing pressure on adjacent grounds

191. Exclusion from fishing grounds during construction in the offshore cable corridor may lead to temporary increases in fishing effort in other areas that may already be exploited thereby leading to gear conflict.

Magnitude of Impact

192. The impact is predicted to be of regional spatial extent, short-term duration and intermittent. The impact is of relevance to national and international fishing fleets and is described below on a fishery-by-fishery basis.

193. UK potting fishery: Conflict over diminished grounds may occur if displaced vessels operating mobile gear (e.g., beam trawl) explore grounds traditionally fished by potters; and/or displaced potting gear is relocated into actively fished potting grounds. Displacement of mobile gear may therefore increase the risk of interaction with potting gear. For mobile gear, displacement could be expected to be focused on alternative grounds in and around The Wash, thereby reducing displacement onto potting grounds. However, it is understood that gear conflict between mobile and potting gear has the potential to occur and impact fishing patterns.

194. When considering the impact of potters being displaced from the offshore ECC 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; or
- 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.

195. On balance, the displacement effect to potters targeting the offshore ECC and biogenic reef restoration areas is considered likely to have an equivalent or lower magnitude of impact than the exclusion impact causing the displacement. Taking all of these aspects into consideration, the magnitude of the displacement impact is assessed to be medium adverse for UK potters.

196. UK dredge fishery: Displacement from the offshore ECC and biogenic reef restoration areas is not expected to affect the dredge fishery, which has a wide operational range, since it is understood to predominantly take place on grounds to the north of the Project. The magnitude of the displacement impact is assessed to be low adverse for UK scallopers.

197. UK beam trawl fishery: The UK beam trawl fishery targeting brown shrimp has the potential to be active in the nearshore portion of the offshore ECC, noting that key grounds targeted by this fleet are located to the south in The Wash. Conflict may occur if displaced vessels operating pots explore grounds traditionally fished by potters.

198. On balance, the displacement effect to beam trawlers targeting the offshore ECC and biogenic reef restoration areas is considered likely to have an equivalent or lower magnitude of impact than the exclusion impact causing the displacement. The magnitude of the displacement impact is assessed to be low adverse for the UK beam trawl fleet.

199. UK demersal seine fishery: Displacement from the offshore ECC and biogenic reef restoration areas is not expected to affect the demersal seine fishery, which has a wide operational range and key grounds located to the south of the Project in the southern North Sea. The magnitude of the displacement impact is assessed to be low adverse for the UK demersal seine fleet.

200. UK netting fishery and UK hooked gear/longline fishery: Displacement from the offshore ECC and biogenic reef restoration areas is not expected to affect these fisheries with evidence indicating limited fleet activity within Project boundaries. The magnitude of displacement is assessed to be negligible adverse.

201. All EU trawl fisheries: Displacement from the offshore ECC and biogenic reef restoration areas is not expected to affect these fisheries since key fishing grounds and therefore activity is located outside of Project boundaries. The magnitude of displacement is assessed to be negligible adverse.

Sensitivity of Receptor

202. The sensitivity of the fleets is as described in paragraphs 117 to 120 and is medium for the UK potting and beam trawl fleets and low for all other fleets.

Significance of Residual Effect

203. UK potting fleet: Overall, it is predicted that the sensitivity of the receptor is medium, and the magnitude of impact is medium. The effect is of **moderate adverse** significance, which is significant in EIA terms. In response to this, and specific to the UK potting fleet where there is a significant residual impact, further mitigation has been identified and is presented below.

204. UK dredge fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the magnitude of impact is low. The effect is of **minor adverse** significance, which is not significant in EIA terms.

205. UK beam trawl fishery: Overall, it is predicted that the sensitivity of the receptor is medium, and the magnitude of impact is low. The effect is of **minor adverse** significance, which is not significant in EIA terms.

206. UK demersal seine fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the magnitude of impact is low. The effect is of **minor adverse** significance, which is not significant in EIA terms.

207. UK netting fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the magnitude of impact is negligible. The effect is of **negligible adverse** significance, which is not significant in EIA terms.

208. UK hooked gear/longline fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the magnitude of impact is negligible. The effect is of **negligible adverse** significance, which is not significant in EIA terms.

209. Dutch beam trawl fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the magnitude of impact is negligible. The effect is of **negligible adverse** significance, which is not significant in EIA terms.

210. Belgian beam trawl fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the magnitude of impact is negligible. The effect is of **negligible adverse** significance, which is not significant in EIA terms.

211. French demersal otter trawl fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the magnitude of impact is negligible. The effect is of **negligible adverse** significance, which is not significant in EIA terms.

Further Mitigation

212. UK potting fleet: mitigation described in paragraph 130 details the approach to ascertain justifiable disruption and co-operation agreements between the Applicant and commercial fishing vessel owners on an individual basis. To mitigate this displacement effect, emphasis is focused on ensuring that the effect of reduced access is mitigated by removing that effort to ensure that it is not moved or displaced elsewhere. This can be delivered in a number of ways, such as the requirement for fishing gear that is subject to a cooperation agreement to be wet or dry stored (i.e., not actively fished), thereby minimising the displacement effect.

213. Through the application of cooperation agreements that appropriately mitigate reduced access by removing fishing effort to ensure displacement does not occur, the residual impacts will be of **minor adverse** significance, which is not significant in EIA terms.

Impact 3: Construction activities leading to disturbance of commercially important fish and shellfish resources leading to displacement or disruption of fishing activity

214. Temporary displacement due to noise and seabed disturbances during construction activities may decrease or displace commercially important fish and shellfish populations from the area. This section assesses the potential temporary subsequent impact for the owners of fishing vessels, where commercially important stocks may be disturbed or displaced to a point where normal fishing practices will be affected.

Magnitude of Impact

215. Detailed assessments of the following potential construction impacts have been undertaken in Chapter 10 Fish and Shellfish Ecology (Document reference 6.1.10):

- Mortality, injury and behavioural changes resulting from underwater noise arising from construction activity;
- Increase in suspended sediment concentration (SSC) and sediment deposition;
- Temporary seabed habitat loss/disturbance;
- Direct and indirect seabed disturbances leading to the release of sediment contaminants; and
- Direct damage (e.g., crushing) and disturbance to mobile demersal and pelagic fish species.

216. 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 of impact and sensitivity of fish and shellfish species are considered to assess the magnitude of impact 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 negligible significance is assessed for a species, a negligible magnitude is assessed for commercial fishing; where an effect of minor adverse significance is assessed for a species, a minor magnitude is assessed for commercial fishing, and so on.

217. Details of the fish and shellfish ecology assessment are summarised in Table 14.10; justifications for this assessment will not be repeated in this chapter. Evidence, modelling and justifications for these assessments are provided in Chapter 10 Fish and Shellfish Ecology (Document reference 6.1.10):.

218. The impact is predicted to be of regional spatial extent, of relevance to international fishing fleets, and of short-term duration. It is predicted that the impact will affect the receptor directly through loss of resources. The magnitude is therefore considered to be low adverse for all species and all potential impacts.

Table 14.10 Significance of effects of construction impacts on fish and shellfish species relevant to commercial fisheries receptors

Potential impact	Magnitude	Sensitivity	Significance of Effect
Mortality, injury and behavioural changes resulting from underwater noise arising from construction activity	Low to Medium	Low to Medium	Minor adverse
Increase in SSC and sediment deposition	Low	Low to Medium	Minor adverse
Temporary seabed habitat loss/disturbance	Low	Negligible to Medium	Minor adverse
Direct and indirect seabed disturbances leading to the release of sediment contaminants	Negligible	Low to Medium	Minor adverse
Direct damage (e.g., crushing) and disturbance to mobile demersal and pelagic fish species	Low	Negligible to Medium	Minor adverse

Sensitivity of Receptor

219. There is potential for fishing grounds beyond the immediate construction activities to be affected by these impacts. Exposure to the impact is likely and commercial fleets targeting key species will be affected, including those targeting shellfish species.

220. There is potential for shellfish grounds beyond the immediate construction activities to be affected by increased suspended sediment and sediment deposition, impacting potting and possibly dredge fleets. The potting fleet is deemed to be of medium vulnerability and medium recoverability reflecting the presence of known fishing grounds within the DCO boundaries. The sensitivity of the receptor is therefore, considered to be medium. The dredge fleet, with key grounds located outside of DCO boundaries, is deemed to be of low vulnerability with receptor sensitivity considered to be low.

221. There is potential for fish species and particularly herring to be impacted by underwater noise generated during the construction phase, associated with pile installation. It is predicted that herring may be impacted up to several kilometres from the noise source, with potential impacts including mortality, injury and behavioural change across varying impact ranges. The EU pelagic trawl fleet that may target herring are active across extensive fishing grounds throughout the central and southern North Sea and beyond and are deemed to be of low vulnerability and high recoverability. The sensitivity of the receptor is therefore considered to be low.

222. Due to the range of alternative areas targeted and the distribution of key commercial species throughout the central North Sea, all other fleets are deemed to be of low vulnerability and high recoverability. The sensitivity is considered to be low for all other mobile fleets.

Significance of Residual Effect

223. UK potting fleet: Overall, it is predicted that the sensitivity of the receptor is medium, and the magnitude of impact is low. The effect is of **minor adverse** significance, which is not significant in EIA terms.

224. All other fleets: Overall, it is predicted that the sensitivity of the receptor is low, and the magnitude of impact is low. The effect is of **minor adverse** significance, which is not significant in EIA terms.

Impact 4: Increased vessel traffic associated with the Project within fishing grounds leading to interference with fishing activity

225. This assessment focuses on the potential impact of the Project-related vessel traffic and changes to shipping patterns as a result of navigational channels leading to interference with fishing activity (i.e., reduced access) during construction.

Magnitude of Impact

226. Vessel movements (i.e., construction vessels transiting to and from areas undergoing construction works) related to the construction of the Project will add to the existing level of shipping activity in the area (see Volume 1, Chapter 15: Shipping and Navigation (Document reference 6.1.15): for a full assessment of additional vessel movements).

227. Continuous liaison with the fishing industry will be undertaken including location and duration of construction activities; further details are provided in an outline Fisheries Liaison and Coexistence Plan (FLCP) (Document reference 8.22).

228. All fishing fleets are considered to be able to avoid vessel movements related to the Project construction. The impact is predicted to be of regional spatial extent, short-term duration, intermittent and high reversibility. It is predicted that the impact will affect the receptor directly. The magnitude is therefore considered to be low adverse for all fisheries.

Sensitivity of Receptor

229. Construction traffic is likely to constrain potting activity across established construction supply routes due to the vulnerability of the marker buoys to the propellers of passing construction vessels. It is noted that shipping routes do currently exist in the vicinity of the Project, and that the construction vessels are likely to follow these existing routes where possible and avoid any observed static gear markers. The UK potting fisheries are deemed to be of medium vulnerability, high recoverability and low-medium value. The sensitivity of these receptors is therefore, considered to be low-medium.

230. All other fishery fleets are expected to be able to avoid the Project construction areas. They are deemed to be of negligible vulnerability, high recoverability and low-medium value. The sensitivity of the receptors is therefore low for all mobile fleets and negligible for the EU pelagic trawl fleet.

Significance of Residual Effect

231. UK potting fleet: Overall, it is predicted that the sensitivity of the receptor is low-medium, and the magnitude of impact is low. The effect is of **minor adverse** significance, which is not significant in EIA terms.

232. UK dredge fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the magnitude of impact is low. The effect is of **minor adverse** significance, which is not significant in EIA terms.

233. UK beam trawl fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the magnitude of impact is low. The effect is of **minor adverse** significance, which is not significant in EIA terms.

234. UK demersal seine fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the magnitude of impact is low. The effect is of **minor adverse** significance, which is not significant in EIA terms.

235. UK netting fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the magnitude of impact is low. The effect is of **minor adverse** significance, which is not significant in EIA terms.

236. UK hooked gear/ longline fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the magnitude of impact is low. The effect is of **minor adverse** significance, which is not significant in EIA terms.

237. Dutch beam trawl fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the magnitude of impact is low. The effect is of **minor adverse** significance, which is not significant in EIA terms.

238. Belgian beam trawl fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the magnitude of impact is low. The effect is of **minor adverse** significance, which is not significant in EIA terms.

239. French demersal otter trawl fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the magnitude of impact is low. The effect is of **minor adverse** significance, which is not significant in EIA terms.

240. EU pelagic trawl fishery: Overall, it is predicted that the sensitivity of the receptor is negligible, and the magnitude of impact is low. The effect is of **negligible adverse** significance, which is not significant in EIA terms.

Impact 5: Additional steaming to alternative fishing grounds for vessels that would otherwise fish within the Project area

241. A detailed Navigational Risk Assessment has been undertaken and is presented in Volume 3, Appendix 15.1 (Document reference 6.3.5.1):, which includes full consideration of commercial fishing vessels while transiting (e.g., from a collision and allision perspective). This assessment focuses on the potential impact of longer steaming distances to alternative fishing grounds while construction processes are ongoing.

Magnitude of Impact

242. The impact is predicted to be of regional spatial extent, of relevance to international fishing fleets, and of short-term duration. It is predicted that the impact will affect the receptor directly.

243. Details of the Project's construction activities will be promulgated in advance of, and during construction via the usual means (e.g., Notice to Mariners, Kingfisher bulletin) to ensure mariners are aware of the ongoing works. Construction works will only necessitate minor deviations for fishing vessels transiting through the site during the construction phase. Localised impacts are anticipated but will be limited to the immediate area of construction activity and associated construction vessels. The magnitude is therefore, considered to be low adverse for all fishing fleets.

Sensitivity of Receptor

244. The UK potting fleet active in the Project area operate across a range of grounds to haul and re-set different fleets of traps/pots/nets on a daily basis. Their normal operating range is expected to extend well beyond the 500m exclusion zones that will be in place around active installation works and advisory safety distances around construction vessels. Given adequate notification it is expected that these vessels will be in a position to avoid construction areas with limited impact upon steaming times.

245. All commercial fisheries fleets are considered to have medium to high availability of alternative fishing grounds and an operational range that is not limited to the Project area. The sensitivity of the receptor is therefore, considered to be low for the UK potting fleet and negligible for all other fisheries.

Significance of Residual Effect

246. UK potting fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the magnitude of impact is low. The effect is of **minor adverse** significance, which is not significant in EIA terms.

247. All other fisheries: Overall, it is predicted that the sensitivity of the receptor is negligible, and the magnitude of impact is low. The effect is of **negligible adverse** significance, which is not significant in EIA terms.

14.7.2 Operations and Maintenance

248. A description of the potential effects on commercial fisheries receptors caused by each identified impact is given below.

Impact 6(A): Physical presence of array area infrastructure leading to reduction in access to, or exclusion from established fishing grounds

249. The assessment assumes that commercial fisheries will be prevented from actively fishing within the footprint of installed infrastructure within the array area, together with associated safety zones for maintenance activities and assumed safe operating distances, as set out in Table 14.5. Minimum turbine spacing is 605m (WTG blade tip to blade tip), including between turbines and all other infrastructure.

250. Outwith this footprint area, the assessment assumes that fishing will be possible within the array area where turbine spacing and turbine layout allow productive grounds to be targeted, with the exception of an assumed 50m operating distance from infrastructure, areas of cable protection, and safety zones around infrastructure undergoing major maintenance or replacement. In addition, the individual decisions made by the skippers of fishing vessels with their own perception of risk will determine the likelihood of whether their fishing will resume within the array area. Inclement weather will be a significant contributor to this risk perception. The type and dimension of fishing gear also influences the potential opportunities within the array area. For example, twin-rigged trawl gears typically require a greater distance for safe operation and these gears are unlikely to target grounds in the vicinity of infrastructure.

Magnitude of Impact

251. This impact will lead to localised loss of access to fishing grounds and the fish and shellfish resources within these grounds for a range of fishing opportunities during the operational and maintenance phase, which will directly affect fleets over a long-term duration, noting an operational design life of approximately 35 years. The impact is predicted to be continuous with low reversibility for the lifetime of the Project and is of relevance to national and international fishing fleets.

252. Evidence on the value and importance of the array area to commercial fishing fleets is the same as that presented for construction in paragraphs 102 to 116.

253. UK potting fishery: A recent study by Roach *et al*. (2018) investigated the effect of the construction and operation of the Westermost Rough offshore windfarm on established lobster fishing grounds (noting that this site lies approximately 8km off the Holderness coast). The study concluded that:

- the temporary closure during the construction period offered some respite from fishing pressure for adult lobsters and led to an increase in abundance and size of lobster in the windfarm area;
- reopening of the site to fishing exploitation saw a decrease in catch rates and size structure, but this did not reach levels below that of the surrounding area;
- opening the site to exploitation allowed the fishery to recuperate some of the economic loss during the closure; and
- finally, the authors conclude that temporary closures of selected areas may be beneficial to lobster fisheries and should be considered as a management option for lobster fisheries.

254. A more recent study by Roach et al. (2022) examined further Westermost Rough lobster fisheries monitoring data gathered in 2019. The study reiterated that the increased catch rates and proportion of larger lobsters observed following windfarm construction could be attributed to temporary closure of the windfarm area during construction. During the operational phase of the windfarm, monitoring data indicate no long-term effect of the windfarm on lobster catch rates or size distribution, though it is acknowledged that the findings of this study are specific to the study location. Based on minimum spacing between Project structures and awareness that potting fisheries do operate in some operational windfarms[1] , it is expected that potting activity will resume within the array area during the operation and maintenance phase and that catch rates will, most likely, initially be higher than comparable grounds outside the array area, before returning to similar baseline levels.

255. Since it is expected that potting activity will resume within the array area during the operation and maintenance phase and the overall magnitude is assessed as low adverse.

256. UK dredge fishery: The array area lies to the south of important scallop grounds. The design of the infrastructure layout (i.e., at least 605m between inter rows of turbines) is expected to allow some levels of dredge activity to resume within the array area. The resumption of fishing, together with the concentration of existing effort outside the Project boundaries leads to a conclusion of low adverse magnitude for UK scallop dredge fisheries during the operational phase.

257. UK demersal seine fishery: Based on fishing gear dimensions and methods of deployment, it is considered unlikely that flyseine activity would resume to any significant extent within an operational windfarm array. However, given that baseline levels of flyseine activity in the array area are likely to be very limited compared to higher intensity fishing grounds elsewhere in the region, the magnitude is assessed as low adverse.

258. All EU trawl fisheries: Given the potential for some resumption of fishing, coupled with the very low levels of baseline activity in the array area compared to higher intensity fishing grounds elsewhere in the region, the magnitude is assessed as low adverse.

Sensitivity of Receptor

259. The sensitivity of the commercial fisheries receptors is the same as that presented for construction in paragraphs 117 to 120, summarised as medium for potting, negligible for pelagic trawl and low for all other fleets.

[1] Can Fisheries Co-exist with Offshore Wind in the Race to Carbon Net Zero? - NFFO

Significance of Residual Effect

260. UK potting fishery: Overall, it is predicted that the sensitivity of the receptor is medium, and the impact magnitude is low. The effect is of **minor adverse** significance, which is not significant in EIA terms.

261. UK dredge fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the magnitude of impact is low. The effect is of **minor adverse** significance, which is not significant in EIA terms.

262. UK demersal seine fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the magnitude of impact is low. The effect is of **minor adverse** significance, which is not significant in EIA terms.

263. Dutch beam trawl fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the magnitude of impact is low. The effect is of **minor adverse** significance, which is not significant in EIA terms.

264. Belgian beam trawl fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the magnitude of impact is low. The effect is of **minor adverse** significance, which is not significant in EIA terms.

265. French demersal otter trawl fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the magnitude of impact is low. The effect is of **minor adverse** significance, which is not significant in EIA terms.

266. EU pelagic fishery: Overall, it is predicted that the sensitivity of the receptor is negligible, and the magnitude of impact is low. The effect is of **negligible adverse** significance, which is not significant in EIA terms.

Impact 6(B): Physical presence of offshore export cable and infrastructure within the offshore export cable corridor leading to reduction in access to, or exclusion from established fishing grounds

267. Temporary 500m safety zones around platforms and any advisory safety distances requested around vessels engaged in export cable repair works, could limit fishing opportunities within localised areas.

268. The European Subsea Cables Association 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”.

269. Notwithstanding this, subsea cables are widespread throughout the waters of Europe, providing power and telecommunications links, and it is understood that fishing does take place in the vicinity of subsea cables (KIS-ORCA, 2022).

270. Biogenic reef may be created within the identified restoration areas, subject to agreement of compensatory measures, with potential for restriction of fishing in these locations, which will be very small in spatial scale.

Magnitude of Impact

271. For the purposes of this assessment, it is assumed that fishermen will be well informed of the location and integrity of the offshore export cables i.e., 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 export cables with caution. The assessment therefore assumes that fishing will resume within the vicinity of the export cables.

272. 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.

273. The impact is predicted to be of local spatial extent and of short-term duration for maintenance works that may be required along the export cables. It is predicted that the impact will affect the receptor directly. Given that fishing is likely to resume across the majority of the offshore ECC, the magnitude is considered to be low adverse for UK potting fisheries and negligible for all other fleets.

Sensitivity of Receptor

274. The mobile gear fleets targeting brown shrimp and demersal fisheries are considered to have moderate to high levels of alternative fishing grounds; are deemed to be of low vulnerability, high recoverability and low-medium value. The sensitivity of these receptors is therefore, considered to be low. The UK potting fleet is deemed to be of medium vulnerability, medium recoverability and low-medium value. The sensitivity of the receptor is therefore, considered to be medium.

Significance of Residual Effect

275. UK potting fishery: Overall, it is predicted that the sensitivity of the receptor is medium, and the impact magnitude is low. The effect is of **minor adverse** significance, which is not significant in EIA terms.

276. UK dredge fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the magnitude of impact is negligible. The effect is of **negligible adverse** significance, which is not significant in EIA terms.

277. UK beam trawl fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the magnitude of impact is low. The effect is of **minor adverse** significance, which is not significant in EIA terms.

278. UK demersal seine fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the magnitude of impact is negligible. The effect is of **negligible adverse** significance, which is not significant in EIA terms.

279. UK netting fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the magnitude of impact is negligible. The effect is of **negligible adverse** significance, which is not significant in EIA terms.

280. UK hooked gear/longline fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the magnitude of impact is negligible. The effect is of **negligible adverse** significance, which is not significant in EIA terms.

281. Dutch beam trawl fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the magnitude of impact is negligible. The effect is of **negligible adverse** significance, which is not significant in EIA terms.

282. Belgian beam trawl fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the magnitude of impact is negligible. The effect is of **negligible adverse** significance, which is not significant in EIA terms.

283. French demersal otter trawl fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the magnitude of impact is negligible. The effect is of **negligible adverse** significance, which is not significant in EIA terms.

Impact 7: Displacement from array area and offshore cable corridor leading to gear conflict and increased fishing pressure on adjacent grounds

284. Exclusion from fishing grounds during operation and maintenance of the Project may lead to increases in fishing effort in other areas that may already be exploited thereby leading to gear conflict.

Magnitude of Impact

285. The magnitude of impact of displacement during the operational and maintenance phase is expected to be similar or slightly lower than the minor magnitude assessed during construction for all commercial fishing fleets deploying mobile gear and is considered to be low adverse for UK dredge, beam trawl and demersal seine fleets, and negligible adverse for all other fleets. Given that potting can resume across the Project area, the magnitude of displacement impacts for UK potters is considered to be low adverse.

Sensitivity of Receptor

286. The sensitivity of the commercial fisheries receptors is similar to that presented for construction, summarised as medium for potting, negligible for EU pelagic trawl and low for all other fleets.

Significance of Residual Effect

287. UK potting fishery: Overall, it is predicted that the sensitivity of the receptor is medium, and the impact magnitude is low. The effect is of **minor adverse** significance, which is not significant in EIA terms. The justification of this minor adverse significance is based on the very high likelihood of resumption of fishing by potting vessels across the Project.

288. UK dredge fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the magnitude of impact is low. The effect is of **minor adverse** significance, which is not significant in EIA terms.

289. UK beam trawl fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the magnitude of impact is low. The effect is of **minor adverse** significance, which is not significant in EIA terms.

290. UK demersal seine fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the magnitude of impact is low. The effect is of **minor adverse** significance, which is not significant in EIA terms.

291. UK netting fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the magnitude of impact is negligible. The effect is of **negligible adverse** significance, which is not significant in EIA terms.

292. UK hooked gear/ longline fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the magnitude of impact is negligible. The effect is of **negligible adverse** significance, which is not significant in EIA terms.

293. Dutch beam trawl fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the magnitude of impact is negligible. The effect is of **negligible adverse** significance, which is not significant in EIA terms.

294. Belgian beam trawl fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the magnitude of impact is negligible. The effect is of **negligible adverse** significance, which is not significant in EIA terms.

295. French demersal otter trawl fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the magnitude of impact is negligible. The effect is of **negligible adverse** significance, which is not significant in EIA terms.

296. EU pelagic trawl fishery: Overall, it is predicted that the sensitivity of the receptor is negligible, and the magnitude of impact is negligible. The effect is of **negligible adverse** significance, which is not significant in EIA terms.

Impact 8: Operation and maintenance activities leading to displacement or disruption of commercially important fish and shellfish resources leading to displacement or disruption of fishing activity

297. Permanent and temporary impacts from operation of the Project and maintenance activities may displace commercially important fish and shellfish populations from the area. This section assesses the potential subsequent impact for the owners of fishing vessels, where commercially important stocks may be disturbed or displaced to a point where normal fishing practices would be affected.

Magnitude of Impact

298. Detailed assessments of the following potential operation and maintenance impacts have been undertaken in Chapter 10 Fish and Shellfish Ecology (Document reference 6.1.10)

- Underwater noise as a result of operational turbines; long-term habitat loss due to the presence of turbine foundations, scour protection and cable protection;
- Increased hard substrate and structural complexity as a result of the introduction of turbine foundations, scour protection and cable protection;
- Direct disturbance resulting from O&M activities; and
- Electro-magnetic (EMF) effects arising from cables.

299. The approach to this assessment follows that outlined for construction, with details of the fish and shellfish ecology assessment summarised in Table 14.11. The impact is predicted to be of regional spatial extent, of relevance to international fishing fleets, and of short-term duration. It is predicted that the impact will affect the receptor directly through loss of resources. The magnitude is considered to be negligible adverse in relation to operational noise impacts and low adverse in relation to all other potential impacts.

Table 14.11 Significance of effects of operation and maintenance impacts on fish and shellfish species relevant to commercial fisheries receptors

Potential impact	Magnitude	Sensitivity	Significance of Effect
Underwater noise as a result of operational turbines	Negligible	Low to Medium	Negligible
Long-term habitat loss due to the presence of turbine foundations, scour protection and cable protection	Low	Negligible to Medium	Negligible to Minor
Increased hard substrate and structural complexity, as a result of the introduction of turbine foundations, scour	Low	Low to Medium	Minor

Potential impact	Magnitude	Sensitivity	Significance of Effect
protection and cable protection			
Direct disturbance resulting from O&M activities	Low	Low to Medium	Minor
EMF effects arising from cables	Low	Low	Minor

Sensitivity of Receptor

300. The sensitivity of the commercial fisheries receptors is the same as that presented for construction in paragraphs 219 to 222, summarised as medium for the UK potting fisheries, and low for all other fisheries.

Significance of Residual Effect

301. UK potting fleet: Overall, it is predicted that the sensitivity of the receptor is medium, and the magnitude of impact is low. The effect is of **minor adverse** significance, which is not significant in EIA terms.

302. All other fleets: Overall, it is predicted that the sensitivity of the receptor is low, and the magnitude of impact is low. The effect is of minor adverse significance, which is not significant in EIA terms.

Impact 9: Increased vessel traffic associated with the Project within fishing grounds leading to interference with fishing activity

Significance of Residual Effect

303. The effects of the operational and maintenance phase are expected to be the same or similar to the effects from construction (see paragraphs 231 to 240). The significance of effect is therefore **negligible adverse** for the EU pelagic fleet and **minor adverse** for all other fleets, which is not significant in EIA terms.

Impact 10: Additional steaming to alternative fishing grounds for vessels that would otherwise fish within the Project area

304. A detailed Navigational Risk Assessment (discussed in Chapter 15 Shipping and Navigation (Document reference 6.1.15) and presented in appendix 15.1 Study Areas for Shipping and Navigation (Document reference 6.3.15.1)) includes full consideration of commercial fishing vessels while transiting (e.g., from a collision and allision perspective). This assessment focuses on the potential impact of longer steaming distances to alternative fishing grounds during the operational and maintenance phase.

Magnitude of Impact

305. The impact is predicted to be of regional spatial extent, of relevance to national and international fishing fleets, and of long-term duration for the lifetime of the Project. It is predicted that the impact will affect the receptor directly.

306. During the operation and maintenance phase, fishing will be possible across the Project area for those fleets currently active within it, with the exception of in the footprint of installed infrastructure and in Safety Zones around infrastructure undergoing major maintenance and advisory safety distances around vessels undertaking major maintenance activities. Such activities will be communicated through NtMs and Kingfisher Bulletins with ample warning provided.

307. It is understood that the individual decisions made by the skippers of fishing vessels with their own perception of risk will determine the likelihood of whether their fishing will resume within the Project area. As such, it is acknowledged that whilst additional steaming to alternative grounds will not be necessary, skippers may choose to steam to grounds outside of the Project area.

308. The magnitude is considered to be low adverse for all fishing fleets.

Sensitivity of Receptor

309. The sensitivity of commercial fishing fleets to this impact is expected to be the same or similar to that for construction (see paragraph 244) and is low for the UK potting fleet and negligible for all other fisheries.

Significance of Residual Effect

310. UK potting fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the impact magnitude is low. The effect is of **minor adverse** significance, which is not significant in EIA terms.

311. UK dredge fishery: Overall, it is predicted that the sensitivity of the receptor is negligible, and the magnitude of impact is low. The effect is of **negligible adverse** significance, which is not significant in EIA terms.

312. UK beam trawl fishery: Overall, it is predicted that the sensitivity of the receptor is negligible, and the magnitude of impact is low. The effect is of **negligible adverse** significance, which is not significant in EIA terms.

313. UK demersal seine fishery: Overall, it is predicted that the sensitivity of the receptor is negligible, and the magnitude of impact is low. The effect is of **negligible adverse** significance, which is not significant in EIA terms.

314. UK netting fishery: Overall, it is predicted that the sensitivity of the receptor is negligible, and the magnitude of impact is low. The effect is of **negligible adverse** significance, which is not significant in EIA terms.

315. UK hooked gear/ longline fishery: Overall, it is predicted that the sensitivity of the receptor is negligible, and the magnitude of impact is low. The effect is of **negligible adverse** significance, which is not significant in EIA terms.

316. Dutch beam trawl fishery: Overall, it is predicted that the sensitivity of the receptor is negligible, and the magnitude of impact is low. The effect is of **negligible adverse** significance, which is not significant in EIA terms.

317. Belgian beam trawl fishery: Overall, it is predicted that the sensitivity of the receptor is negligible, and the magnitude of impact is low. The effect is of **negligible adverse** significance, which is not significant in EIA terms.

318. French demersal otter trawl fishery: Overall, it is predicted that the sensitivity of the receptor is negligible, and the magnitude of impact is low. The effect is of **negligible adverse** significance, which is not significant in EIA terms.

319. EU pelagic trawl fishery: Overall, it is predicted that the sensitivity of the receptor is negligible, and the magnitude of impact is low. The effect is of **negligible adverse** significance, which is not significant in EIA terms.

Impact 11: Physical presence of infrastructure leading to gear snagging

320. The array cables, interlink cables and export cables and associated cable protection, together with any structures (and associated scour protection) on the seabed represent 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 Chapter 15 Shipping and Navigation (Document reference 6.1.15).

Magnitude of Impact

321. In the instance that snagging does occur, the Applicant 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, in particular section 11 Dealing with claims for loss or damage of gear.

322. 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.

323. It is considered likely that fishermen will operate appropriately (i.e., avoiding the indicated infrastructure and cable protection at the defined location) given adequate notification of the locations of any snagging hazards; and are highly likely to avoid the infrastructure and cable protection within the Project area.

324. Based on the measures that will be implemented as part of the project and the commitment to follow standard protocols should snagging occur, the magnitude is considered to be low adverse for all fleets.

Sensitivity of Receptor

325. Due to the nature and operation of mobile demersal gear (i.e., 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 mobile gear fisheries (i.e. beam trawls, demersal trawls and dredges).

326. UK potters, gear with hooks and netters show a low vulnerability as the gear is placed, not towed and is less likely to penetrate the seabed. The sensitivity of UK potters and netters and hooked gear fleets is considered to be low.

327. Pelagic gear does not come into contact with the seabed and therefore has low vulnerability to snagging seabed infrastructure. The sensitivity of the EU pelagic trawl fleet is considered to be negligible.

Significance of Residual Effect

328. Project embedded mitigation measures include adherence to FLOWW guidance, a commitment to cable burial as the preferred option for cable protection, and appropriate marking and charting of infrastructure. Taking account of these measures, the residual effect on each fishery is set out immediately below, noting that the effect in all cases will be direct and temporary.

329. UK potting fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the impact magnitude is low. The effect is of **minor adverse** significance, which is not significant in EIA terms.

330. UK dredge fishery: Overall, it is predicted that the sensitivity of the receptor is medium, and the magnitude of impact is low. The effect is of **minor adverse** significance, which is not significant in EIA terms.

331. UK beam trawl fishery: Overall, it is predicted that the sensitivity of the receptor is medium, and the magnitude of impact is low. The effect is of **minor adverse** significance, which is not significant in EIA terms.

332. UK demersal seine fishery: Overall, it is predicted that the sensitivity of the receptor is medium, and the magnitude of impact is low. The effect is of **minor adverse** significance, which is not significant in EIA terms.

333. UK netting fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the impact magnitude is low. The effect is of **minor adverse** significance, which is not significant in EIA terms.

334. UK hooked gear/ longline fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the impact magnitude is low. The effect is of **minor adverse** significance, which is not significant in EIA terms.

335. Dutch beam trawl fishery: Overall, it is predicted that the sensitivity of the receptor is medium, and the magnitude of impact is low. The effect is of **minor adverse** significance, which is not significant in EIA terms.

336. Belgian beam trawl fishery: Overall, it is predicted that the sensitivity of the receptor is medium, and the magnitude of impact is low. The effect is of **minor adverse** significance, which is not significant in EIA terms.

337. French demersal otter trawl fishery: Overall, it is predicted that the sensitivity of the receptor is medium, and the magnitude of impact is low. The effect is of **minor adverse** significance, which is not significant in EIA terms.

338. EU pelagic trawl fishery: Overall, it is predicted that the sensitivity of the receptor is negligible, and the magnitude of impact is negligible. The effect is of **negligible adverse** significance, which is not significant in EIA terms.

14.7.3 Decommissioning

339. A description of the potential effects on commercial fisheries receptors caused by each identified impact is given below.

Impact 12: Reduction in access to, or exclusion from established fishing grounds

Significance of Residual Effect

340. The effects of decommissioning activities are expected to be the same or similar to the effects from construction (see paragraphs 121 to 130, and 160 to 171). The residual significance of effect is therefore **minor adverse** for the potting fleet (subject to further mitigation), **negligible adverse** for EU trawl fleets, and **minor adverse** for all other fleets, which is not significant in EIA terms.

Impact 13: Displacement leading to gear conflict and increased fishing pressure on adjacent grounds

Significance of Residual Effect

341. The effects of decommissioning activities are expected to be the same or similar to the effects from construction (see paragraphs 182 to 190, and 203 to 213). The residual significance of effect is therefore **minor adverse** for the potting fleet (subject to further mitigation), **negligible adverse** for EU trawl fleets and UK netting and hooked gear fleets, and **minor adverse** for all other fleets, which is not significant in EIA terms.

Impact 14: Disturbance of commercially important fish and shellfish resources leading to displacement or disruption of fishing activity

Significance of Residual Effect

342. The effects of decommissioning activities are expected to be the same or similar to the effects from construction (see paragraphs 223 and 224). The significance of effect is therefore **minor adverse** for all fleets, which is not significant in EIA terms.

Impact 15: Increased vessel traffic associated with the Project within fishing grounds leading to interference with fishing activity

Significance of Residual Effect

343. The effects of decommissioning activities are expected to be the same or similar to the effects from construction (see paragraphs 231 to 240). The significance of effect is therefore **negligible adverse** for the EU pelagic trawl fleet and **minor adverse** for all other fleets, which is not significant in EIA terms.

Impact 16: Additional steaming to alternative fishing grounds for vessels that would otherwise fish within the Project area

Significance of Residual Effect

344. The effects of decommissioning activities are expected to be the same or similar to the effects from construction (see paragraphs 246 and 247). The significance of effect is therefore **minor adverse** for the potting fleet and **negligible adverse** for all other fleets, which is not significant in EIA terms.

Impact 17: Physical presence of infrastructure leading to gear snagging

345. The effects of decommissioning activities are expected to be the same or similar to the effects from construction (see paragraphs 329 to 338). The significance of effect is therefore **minor adverse** for all fleets, which is not significant in EIA terms.

14.8 Cumulative Impact Assessment

346. This cumulative impact assessment (CIA) for commercial fisheries has been undertaken in accordance with the methodology provided in Volume 3, Appendix 5.1: Cumulative Impact Assessment Methodology (Document reference 6.3.5.1).

347. The projects and plans selected as relevant to the assessment of impacts to commercial fisheries are based upon an initial screening exercise undertaken on a long list. Each project, plan or activity has been considered and scoped in or out on the basis of effect-receptor pathway, data confidence and the temporal and spatial scales involved. For the purposes of assessing the impact of the Project on commercial fisheries in the region, the cumulative effect assessment technical note submitted through the EIA Evidence Plan and forming the Navigational Risk Assessment (Document reference 6.3.15.1) of this ES screened in a number of projects and plans as presented in Table 14.12.

348. For the potential effects for commercial fisheries, other planned developments were screened into the assessment based on a CIA study area focused on the southern North Sea.

349. Only those developments in the short list that fall within the commercial fisheries CIA study area have the potential to result in cumulative effects with the Project. All other developments falling outside the commercial fisheries CIA study area are excluded from this assessment. Where the effect of other developments is already captured within the time period covered by baseline data collection, these are also excluded from CEA since their effect on commercial fisheries activity has already been captured in the baseline description presented in Section 14.7.

350. The cumulative impact assessment includes designated sites as a project or plan in the context of commercial fisheries, as management measures such as seasonal and/or gear exclusions implemented to protect designated features in these sites may lead to reduced access for commercial fisheries, amongst other impacts. The Marine Protected Areas (MPAs) considered in the assessment include all Special Areas of Conservation (SACs), Marine Conservation Zones (MCZs), Special Protected Areas (SPAs) and non-UK Sites of Community Importance (SCI) within the cumulative impact assessment study area.

Table 14.12: Projects considered within the commercial fisheries cumulative effect assessment

Development type	Project	Status	Data confidence assessment/phase	Tier
Offshore energy	North Falls	Pre-planning Application	High–- Third party project details published in the public domain.	Tier 2
Offshore energy	East Anglia TWO	Consented	High – Consented by applicant.	Tier 1
Offshore energy	East Anglia ONE NORTH	Consented	High – Consented by applicant.	Tier 1
Offshore energy	East Anglia THREE	Consented	High – Consented by applicant.	Tier 1
Offshore energy	Norfolk Vanguard West	Consented	High – Consented by applicant.	Tier 1
Offshore energy	Norfolk Vanguard East	Consented	High – Consented by applicant.	Tier 1
Offshore energy	Norfolk Boreas	Consented	High – Consented by applicant.	Tier 1
Offshore energy	Sheringham Shoal Extension	in Planning - Under Examination	High–- Third party project details published in the public domain.	Tier 1

Development type	Project	Status	Data confidence assessment/phase	Tier
Offshore energy	Dudgeon Extension	in Planning - Under Examination	High–- Third party project details published in the public domain.	Tier 1
Offshore energy	Hornsea Project Three (HOW03)	Consented	High – Consented by applicant.	Tier 1
Offshore energy	Hornsea Project Four (HOW04)	Consented	High–- Third party project details published in the public domain.	Tier 1
Offshore energy	Dogger Bank A	Under Construction	High – Under construction.	Tier 1
Offshore energy	Sofia	Under Construction	High – Under construction.	Tier 1
Offshore energy	Dogger Bank B	Under Construction	High – Under construction.	Tier 1
Offshore energy	Dogger Bank C	Under Construction	High – Under construction.	Tier 1
Offshore energy	Dogger Bank D	Pre-planning Application	High–- Third party project details published in the public domain.	Tier 2
Offshore energy	Hollandse Kust (West)	Planned	High – Third party project details published in the public domain.	Tier 2
Offshore energy	Hollandse Kust (Noord)	Under Construction	High – Under construction.	Tier 1
Offshore energy	HKN Kavel V	Approved	High – Consented by applicant.	Tier 1
Offshore energy	HKZ Kavel IV	Under Construction	High – Under construction.	Tier 1
Offshore energy	HKZ Kavel III	Under Construction	High – Under construction.	Tier 1
Offshore energy	Hollandse Kust (Zuid)	Under Construction	High – Under construction.	Tier 1
Offshore energy	Hollandse Kust Zuid Holland III	Under Construction	High – Under construction.	Tier 1
Offshore energy	Five Estuaries Offshore Wind Farm Limited	Pre-planning Application	High – Third party project details	Tier 2

Development type	Project	Status	Data confidence assessment/phase	Tier
			published in the public domain.	
Carbon capture and storage	Endurance Carbon Capture and Storage Lease Area	Area for Lease	High – Third party project details published in the public domain.	Tier 2
Designated site with confirmed fishing restrictions	Inner Dowsing, Race Bank and North Ridge Special Area of Conservation (SAC) byelaw 2022 (bottom towed fishing, use of pots and anchored nets and lines)	Designated with byelaw enacted	High – designated.	Tier 1
Designated site with confirmed fishing restrictions	Dogger Bank SAC byelaw 2022 (bottom towed fishing)	Designated with byelaw enacted	High – designated.	Tier 1
Designated site with planned fishing restrictions	Haisborough, Hammond and Winterton SAC (draft byelaw for bottom towed fishing in consultation in 2023, consultation closed March 2023, outcome awaited)	Designated with likely future byelaw	High – designated.	Tier 1
Designated site with planned fishing restrictions	North Norfolk Sandbanks and Saturn Reef SAC (draft byelaw for bottom towed fishing in consultation in 2023, consultation closed March	Designated with likely future byelaw	High – designated.	Tier 1

Development type	Project	Status	Data confidence assessment/phase	Tier
	2023, outcome awaited)			
Designated sites with possible fishing restrictions to protect designated features (or where management measures were in place during the baseline study period)	SACs: North Norfolk Coast, The Wash and North Norfolk Coast, Southern North Sea Marine Conservation Zones (MCZs): Cromer Shoal Chalk Beds, Markham's Triangle, Holderness Inshore and Holderness Offshore Special Protection Areas (SPAs): The Wash, North Norfolk Coast, Greater Wash and Humber Estuary	Designated with potential for future fisheries management measures	High – designated.	Tier 1

351. Certain impacts assessed for Project alone are not considered in the cumulative assessment due to:

- the highly localised nature of the impacts (i.e., they occur entirely within the Project only);
- management measures in place for the Project (Table 14.6) will also be in place on other projects reducing their risk of occurring; and/or
- where the potential significance of the impact from the Project alone has been assessed as negligible.

352. The impacts excluded from the CIA for the above reasons are:

- increased risk of gear snagging;
- displacement or disruption of commercially important fish and shellfish resources leading to displacement or disruption of fishing activity;

- increased vessel traffic within fishing grounds as a result of changes to shipping routes and project related vessel traffic leading to interference with fishing activity; and
- additional steaming to alternative fishing grounds for vessels that would otherwise fish within the Project area.

353. Therefore, the impacts that are considered in the CIA during construction and operation and maintenance are as follows:

- reduction in access to, or exclusion from established fishing grounds; and
- displacement leading to gear conflict and increased fishing pressure on established fishing grounds.

354. The cumulative MDS for the Project is outlined in Table 14.13.

Table 14.13: Cumulative MDS

Impact	Scenario	Justification
Cumulative reduction in access to, or exclusion from established fishing grounds	All Tier 1 developments: ▪ Offshore windfarms: 20 offshore windfarms ▪ Designated sites: 14 marine protected areas	Outcome of the CIA will be greatest when the greatest number of other schemes, present or planned, are considered.
Cumulative displacement leading to gear conflict and increased fishing pressure on established fishing grounds	All Tier 2 developments: ▪ Offshore windfarms: 4 offshore windfarms ▪ Carbon capture and storage: 1 lease area	

Impact 18: Cumulative reduction in access to, or exclusion from established fishing grounds

Tier 1

355. There is potential for cumulative reduction in access to or exclusion from established fishing grounds as a result of construction activities associated with the Project and other developments. This additive impact has been assessed within the southern North Sea, which is considered to be representative of the fishing grounds exploited by the fleets active across the study area.

356. The effect from aggregate, pipeline and oil and gas infrastructure projects is expected to be extremely localised in nature, with no additional cumulative effect on the fleets active across the study area.

357. 20 offshore windfarms are included in the Tier 1 assessment. The windfarms most proximate to the Project are the Dudgeon and Sheringham Shoal extensions (within 20 km of the Project), for which consent applications have been submitted. Hornsea Project Four is consented and located approximately 35 km from the Project. All other offshore windfarms are located over 50 km from the Project.

358. Also identified under Tier 1 are designated sites. A network of MCZs, SACs and SPAs have the potential to have cumulative impacts on commercial fisheries. Of specific note based on their proximity to the Project are the Dogger Bank SAC and Inner Dowsing, Race Bank and North Ridge SAC, where byelaws have been introduced in 2022 to restrict certain forms of fishing in areas of the SACs. In Inner Dowsing, Race Bank and North Ridge SAC, an MMO byelaw prevents the use of bottom towed fishing gear in specified areas of reef and sandbank and prevents the use of static fishing gear in a specified area of reef; some of these specified areas overlap with the offshore ECC. The Dogger Bank SAC byelaw prevents the use of bottom towed fishing gear in specified areas. Consultation on draft byelaws to limit use of bottom towed fishing gear in specified reef areas within the Haisborough, Hammond and Winterton SAC and North Norfolk Sandbanks and Saturn Reef SAC is ongoing in 2023, noting that fishing activity in these SACs is currently dominated by non-UK beam trawling (MMO, 2023).

Tier 2

359. The effect from the Endurance carbon capture and storage project, located approximately 46 km from the Project, is expected to be extremely localised in nature, with no additional cumulative effect on the fleets active across the study area.

360. Four offshore windfarms are included in the Tier 2 assessment. These projects are each over 150 km from the Project and may be within the range of highly mobile fleets active across the study area.

Magnitude of Impact

361. UK potting fishery: It is not anticipated that the inshore UK potting fleet operating in the Project will target grounds in other Tier 1 or 2 project areas, though it is noted that there is a static gear exclusion in small areas of reef in Inner Dowsing, Race Bank and North Ridge SAC associated with introduction of a 2022 byelaw (though these are understood to not have been historically heavily targeted by potting vessels, MMO, 2021). The UK potting fleet demonstrates a limited degree of vulnerability to cumulative impacts of exclusion where Project construction activity in the offshore ECC overlaps temporally with the byelaw exclusion. Any effect will be short-term and temporary and fishing will be able to resume in the offshore ECC once construction activities are complete. The offshore potting fleet involving larger vessels may target grounds in other Tier 1 or 2 project areas. The UK potting fleet operating further offshore also demonstrates some vulnerability to cumulative impacts of exclusion where Project construction activity overlaps with construction activity in other offshore windfarms. Any effect will be short-term and temporary and fishing will be able to resume once construction activities are complete, noting also that proximate offshore windfarm projects are not located within key potting grounds but towards their further extents. The cumulative impact on the UK potting fleet is predicted to be of regional spatial extent, short-term duration and intermittent. It is predicted that the impact will affect the receptor directly. The magnitude is considered to be low for the UK potting fleet operating inshore, and applying a precautionary approach, low-medium adverse for the UK potting fleet operating across wider grounds that incorporate other Tier 1 and 2 projects.

362. UK dredge fishery: It is possible that the UK dredge fishery that may operate occasionally in the Project area will target grounds in other Tier 1 and 2 project areas. It is noted that there is a bottom-towed gear exclusion in Dogger Bank SAC and the Inner Dowsing, Race Bank and North Ridge SAC associated with the introduction of a 2022 byelaw. Mobile gear fleets typically operate over wide areas and are not restricted to the footprint of the Project. Data indicates limited UK dredge activity within Project boundaries. Where a cumulative impact may affect the receptor, it will be direct and of regional spatial extent. The magnitude of impact is considered to be low adverse for the UK dredge fleet.

363. UK beam trawl fishery: It is possible but unlikely that the UK beam trawl fleet operating in the nearshore extent of the Project study area will target grounds in other Tier 1 and 2 project areas. Mobile gear fleets typically operate over relatively wide areas and are not restricted to the footprint of the Project. Data indicates limited UK beam trawl activity within the offshore Order Limits, with potential for activity focused in the nearshore offshore ECC. Where a cumulative impact may affect the receptor, it will be direct and of regional spatial extent. The magnitude of impact is considered to be low adverse for the UK beam trawl fleet.

364. UK demersal seine fishery: It is possible that the UK demersal seine fishery that may operate occasionally in the Project area will target grounds in other Tier 1 and 2 project areas. It is noted that there is a bottom-towed gear exclusion in Dogger Bank SAC associated with the introduction of a 2022 byelaw. Mobile gear fleets typically operate over wide areas and are not restricted to the footprint of the Project. Data indicates limited UK demersal seine activity within Project boundaries. Where a cumulative impact may affect the receptor, it will be direct and of regional spatial extent. The magnitude of impact is considered to be low adverse for the UK demersal seine fleet.

365. UK netting fishery: It is not anticipated that the UK netting fleet operating in the Project area will target grounds in other Tier 1 or 2 project areas. The fleet demonstrates limited vulnerability to cumulative impacts. Where a cumulative impact may affect the receptor, it will be direct, of regional spatial extent, short-term duration and intermittent. The magnitude of impact is considered to be negligible adverse for the UK netting fleet.

366. UK hooked gear/longline fishery: It is not anticipated that the UK hooked gear fleet operating in the Project area will target grounds in other Tier 1 or 2 project areas. The fleet demonstrates limited vulnerability to cumulative impacts. Where a cumulative impact may affect the receptor, it will be direct, of regional spatial extent, short-term duration and intermittent. The magnitude of impact is considered to be negligible adverse for the UK hooked gear/longline fleet.

367. Dutch beam trawl fishery: It is possible that the Dutch beam trawl fleet operating occasionally in the Project study area will target grounds in other Tier 1 and 2 project areas. Mobile gear fleets typically operate over wide areas and are not restricted to the footprint of the Project. Data indicates limited Dutch beam trawl activity within Project boundaries. Where a cumulative impact may affect the receptor, it will be direct and of regional spatial extent. The magnitude of impact is considered to be low adverse for the fleet.

368. Belgian beam trawl fishery: It is possible that the Belgian beam trawl fleet operating occasionally in the Project study area will target grounds in other Tier 1 and 2 project areas. Mobile gear fleets typically operate over wide areas and are not restricted to the footprint of the Project. Data indicates limited Belgian beam trawl activity within Project boundaries. Where a cumulative impact may affect the receptor, it will be direct and of regional spatial extent. The magnitude of impact is considered to be low adverse for the fleet.

369. French demersal otter trawl fishery: It is possible that the French demersal otter trawl fleet operating occasionally in the Project study area across the central portion of the offshore ECC will target grounds in other Tier 1 and 2 project areas. Mobile gear fleets typically operate over wide areas and are not restricted to the footprint of the Project. Data indicates limited French demersal otter trawl activity within Project boundaries. Where a cumulative impact may affect the receptor, it will be direct and of regional spatial extent. The magnitude of impact is considered to be low adverse for the fleet.

370. EU pelagic trawl fishery: It is possible that the EU pelagic trawl fleet which may operate very sporadically in the Project study area will target grounds in other Tier 1 and 2 project areas. Mobile gear fleets typically operate over very wide areas and are not restricted to the footprint of the Project. Data indicates limited EU pelagic trawl activity within Project boundaries. Where a cumulative impact may affect the receptor, it will be direct and of regional spatial extent. The magnitude of impact is considered to be low adverse for the fleet.

Sensitivity of Receptor

371. Based on the operating ranges of the receptors and availability of alternative fishing grounds, the UK potting, netting and hooked gear fleets are deemed to be of medium vulnerability and have medium recoverability, are considered to have medium sensitivity.

372. Mobile fleets targeting demersal and pelagic species are deemed to be of low vulnerability, medium recoverability and to have high levels of alternative fishing grounds. The sensitivity of these receptors is considered to be low.

Significance of Residual Effect

373. UK potting fishery: Overall, it is predicted that the sensitivity of the receptor is medium, and the impact magnitude is low-medium. The effect is of **minor-moderate adverse** significance, which is potentially significant in EIA terms. The application of Project-specific mitigation relevant to this fleet during construction (see 'Further Mitigation at paragraphs 1.7.32 and 1.7.33) makes the contribution from ODOW to this potential effect *de minimis*.

374. UK dredge fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the magnitude of impact is low. The effect is of **minor adverse** significance, which is not significant in EIA terms.

375. UK beam trawl fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the magnitude of impact is low. The effect is of **minor adverse** significance, which is not significant in EIA terms.

376. UK demersal seine fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the magnitude of impact is low. The effect is of **minor adverse** significance, which is not significant in EIA terms.

377. UK netting fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the impact magnitude is low. The effect is of **negligible adverse** significance, which is not significant in EIA terms.

378. UK hooked gear/ longline fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the impact magnitude is low. The effect is of **negligible adverse** significance, which is not significant in EIA terms.

379. Dutch beam trawl fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the magnitude of impact is low. The effect is of **minor adverse** significance, which is not significant in EIA terms.

380. Belgian beam trawl fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the magnitude of impact is low. The effect is of **minor adverse** significance, which is not significant in EIA terms.

381. French demersal otter trawl fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the magnitude of impact is low. The effect is of **minor adverse** significance, which is not significant in EIA terms.

382. EU pelagic trawl fishery: Overall, it is predicted that the sensitivity of the receptor is low, and the magnitude of impact is low. The effect is of **minor adverse** significance, which is not significant in EIA terms.

14.8.1 Impact 19: Cumulative displacement leading to gear conflict and increased fishing pressure on established fishing grounds

383. The effect of displacement leading to gear conflict and increased fishing pressure is directly correlated to the previous impact of reduced access to fishing grounds (i.e., if there is no reduction in access, then there will be no displacement).

Magnitude of Impact

384. As described above in relation to reduced access effects, the magnitude is considered to be low-medium adverse for the UK potting fleet, negligible adverse for the UK netting and hooked gear fleets and low adverse for all other fleets.

Sensitivity of Receptor

385. The sensitivity of the receptors is consistent with the assessment of reduced access to fishing grounds. The sensitivity is therefore medium for the UK potting, netting and hooked gear fleets and low for all other commercial fishing fleets.

Significance of Residual Effect

386. The significance of the effects is consistent with the assessment of reduced access to fishing grounds and is considered to be **minor-moderate adverse** for the UK potting fleet, **negligible adverse** for the UK netting and hooked gear fleets, and **low adverse** for all other fleets. The application of Project-specific mitigation relevant to the UK potting fleet during construction (see 'Further Mitigation' at paragraph 130) makes the contribution from the Project to this potential effect *de minimis*.

14.9 Inter-Relationships

387. The inter-related effects assessment considers likely significant effects from multiple impacts and activities from the construction, operation and decommissioning of the Project on the same receptor, or group of receptors. Such inter-related effects include both:

- project lifetime effects: i.e., those arising throughout more than one phase of the project (construction, operation, and decommissioning) to interact to potentially create a more significant effect on a receptor than if just one phase were assessed in isolation; and
- receptor led effects: Assessment of the scope for all effects to interact, spatially and temporally, to create inter-related effects on a receptor (or group). Receptor-led effects might be short-term, temporary or transient effects, or incorporate longer term effects.

388. 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 project phase.

14.10 Transboundary Effects

389. Transboundary effects arise when impacts from a development within one European Economic Area (EEA) state affects the environment of another EEA state(s). A screening of transboundary effects has been carried out by The Planning Inspectorate (The Planning Inspectorate, 2022). The screening exercise identified the following potential transboundary effects on commercial fisheries:

- effects on commercial fishing fleets as a result of impacts from the Project on commercial fish stocks in the waters of other 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 Project area, including beam trawling, demersal trawling and pelagic trawling. These effects may include reduction in access to fishing grounds and potential displacement of fishing effort from the Project to alternative fishing grounds in other EEA States, which will have direct implications for that fishing ground.

390. Effects on biological resources could occur over a range of 10s of kilometres from the Project but are considered unlikely to interact with other EEA states, with nearest European mainland coastlines located over 100km away and potential underwater noise effects not extending to such a distance (see Volume 1, Chapter 10 (Document reference 6.1.10):). With no transboundary impacts predicted to result from the Project on fish and shellfish receptors, similarly no transboundary impact of effects on commercial fish stocks in the waters of other EEA States on commercial fisheries is predicted.

391. Effects on commercial fishing fleets could occur over a range of 100s of kilometres from the Project and could therefore interact with the following EEA states: the Netherlands, Germany, Belgium and France. Effects on these foreign commercial fishing fleets from EEA states, in terms of reduction in access to grounds within the Project and displacement into alternative grounds including other EEZs have been considered in the assessment presented in this chapter and were found to be minor for all non-UK EEA states. Therefore, the potential transboundary impact of constraints on foreign commercial fishing activities is concluded to be of minor significance and is therefore considered to be not significant in EIA terms.

14.11 Conclusions

392. Table 14.14 presents a summary of the assessment of significant impacts, any relevant embedded mitigation measures and residual effects on commercial fisheries receptors.

Table 14.14: Summary of effects for commercial fisheries.

Description of effect	Effect	Additional mitigation measures	Residual impact
Construction			
Impact 1(A): Reduction in access to, or exclusion from established fishing grounds (array area)	UK potting fishery	Yes – implementation of evidence-based mitigation in line with FLOWW guidelines, following procedures to be set out within the outline Fisheries Liaison and Coexistence Plan	No significant adverse residual effects
	UK dredge fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	UK demersal seine fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	Dutch beam trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	Belgian beam trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	French demersal otter trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects

Description of effect	Effect	Additional mitigation measures	Residual impact
	EU pelagic trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
Impact 1(B): Reduction in access to, or exclusion from established fishing grounds (offshore ECC)	UK potting fishery	Yes – implementation of evidence-based mitigation in line with FLOWW guidelines, following procedures to be set out within the outline Fisheries Liaison and Coexistence Plan	No significant adverse residual effects
	UK dredge fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	UK beam trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	UK demersal seine fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	UK netting fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	UK hooked gear/ longline fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	Dutch beam trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	Belgian beam trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	French demersal otter trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	EU pelagic trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
Impact 2(A): Displacement leading to gear conflict and	UK potting fishery	Yes – implementation of evidence-based mitigation in line with FLOWW	No significant adverse residual effects

Description of effect	Effect	Additional mitigation measures	Residual impact
increased fishing pressure on adjacent grounds (array area)		guidelines, following procedures to be set out within the outline Fisheries Liaison and Coexistence Plan	
	UK dredge fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	UK demersal seine fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	Dutch beam trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	Belgian beam trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	French demersal otter trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	EU pelagic trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
Impact 2(B): Displacement leading to gear conflict and increased fishing pressure on adjacent grounds (offshore ECC)	UK potting fishery	Yes – implementation of evidence-based mitigation in line with FLOWW guidelines, following procedures to be set out within the outline Fisheries Liaison and Coexistence Plan	No significant adverse residual effects
	UK dredge fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	UK beam trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	UK demersal seine fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects

Description of effect	Effect	Additional mitigation measures	Residual impact
	UK netting fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	UK hooked gear/ longline fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	Dutch beam trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	Belgian beam trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	French demersal otter trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	EU pelagic trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
Impact 3: Disturbance of commercially important fish and shellfish resources leading to displacement or disruption of fishing activity	UK potting fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	UK dredge fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	UK beam trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	UK demersal seine fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	UK netting fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	UK hooked gear/ longline fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	Dutch beam trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects

Description of effect	Effect	Additional mitigation measures	Residual impact
	Belgian beam trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	French demersal otter trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	EU pelagic trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
Impact 4: Increased vessel traffic associated with the Project within fishing grounds leading to interference with fishing activity	UK potting fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	UK dredge fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	UK beam trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	UK demersal seine fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	UK netting fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	UK hooked gear/ longline fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	Dutch beam trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	Belgian beam trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	French demersal otter trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	EU pelagic trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects

Description of effect	Effect	Additional mitigation measures	Residual impact
Impact 5: Additional steaming to alternative fishing grounds for vessels that would otherwise fish within the Project area	UK potting fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	UK dredge fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	UK beam trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	UK demersal seine fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	UK netting fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	UK hooked gear/ longline fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	Dutch beam trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	Belgian beam trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	French demersal otter trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	EU pelagic trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
Operation and Maintenance			
Impact 6(A): Reduction in access to, or exclusion from established fishing grounds (array area)	UK potting fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	UK dredge fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	UK demersal seine fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects

Description of effect	Effect	Additional mitigation measures	Residual impact
	Dutch beam trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	Belgian beam trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	French demersal otter trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	EU pelagic trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
Impact 6(B): Reduction in access to, or exclusion from established fishing grounds (offshore ECC)	UK potting fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	UK dredge fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	UK beam trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	UK demersal seine fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	UK netting fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	UK hooked gear/ longline fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	Dutch beam trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	Belgian beam trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	French demersal otter trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects

Description of effect	Effect	Additional mitigation measures	Residual impact
	EU pelagic trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
Impact 7: Displacement leading to gear conflict and increased fishing pressure on adjacent grounds	UK potting fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	UK dredge fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	UK beam trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	UK demersal seine fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	UK netting fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	UK hooked gear/ longline fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	Dutch beam trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	Belgian beam trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	French demersal otter trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	EU pelagic trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
Impact 8: Disturbance of commercially important fish and shellfish resources leading to displacement or	UK potting fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	UK dredge fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects

Description of effect	Effect	Additional mitigation measures	Residual impact
disruption of fishing activity	UK beam trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	UK demersal seine fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	UK netting fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	UK hooked gear/ longline fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	Dutch beam trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	Belgian beam trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	French demersal otter trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	EU pelagic trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
Impact 9: Increased vessel traffic associated with the Project within fishing grounds leading to interference with fishing activity	UK potting fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	UK dredge fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	UK beam trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	UK demersal seine fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	UK netting fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects

Description of effect	Effect	Additional mitigation measures	Residual impact
	UK hooked gear/ longline fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	Dutch beam trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	Belgian beam trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	French demersal otter trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	EU pelagic trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
Impact 10: Additional steaming to alternative fishing grounds for vessels that would otherwise fish within the Project area	UK potting fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	UK dredge fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	UK beam trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	UK demersal seine fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	UK netting fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	UK hooked gear/ longline fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	Dutch beam trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	Belgian beam trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects

Description of effect	Effect	Additional mitigation measures	Residual impact
	French demersal otter trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	EU pelagic trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
Impact 11: Physical presence of infrastructure leading to gear snagging	UK potting fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	UK dredge fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	UK beam trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	UK demersal seine fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	UK netting fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	UK hooked gear/ longline fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	Dutch beam trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	Belgian beam trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	French demersal otter trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	EU pelagic trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
Decommissioning			
Impacts 12 to 17: As per construction phase. The magnitude of effect is considered to be no greater, and in all probability less, than in the construction phase. Therefore, it is anticipated that any decommissioning impacts would be no greater, and probably less than that assessed for the construction phase.			

Description of effect	Effect	Additional mitigation measures	Residual impact
Cumulative			
Impact 18: Reduction in access to, or exclusion from established fishing grounds	UK potting fishery	Not Applicable – no additional mitigation identified (beyond Project-specific measures)	Overall moderate, however contribution from the Project to this potential effect is *de minimis*.
	UK dredge fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	UK beam trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	UK demersal seine fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	UK netting fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	UK hooked gear/ longline fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	Dutch beam trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	Belgian beam trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	French demersal otter trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	EU pelagic trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
Impact 19: Displacement leading to gear conflict and increased fishing pressure on adjacent grounds	UK potting fishery	Not Applicable – no additional mitigation identified (beyond Project-specific measures)	No significant adverse residual effects (contribution from the Project to this potential effect *de minimis*)

Description of effect	Effect	Additional mitigation measures	Residual impact
	UK dredge fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	UK beam trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	UK demersal seine fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	UK netting fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	UK hooked gear/ longline fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	Dutch beam trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	Belgian beam trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	French demersal otter trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects
	EU pelagic trawl fishery	Not Applicable – no additional mitigation identified	No significant adverse residual effects

14.12 References

Blyth-Skyrme, R.E., (2010a). Options and opportunities for marine fisheries mitigation associated with windfarms. Final report for Collaborative Offshore Wind Research Into the Environment contract FISHMITIG09. COWRIE Ltd, London. 125 pp.

Blyth-Skyrme, R.E., (2010b). Options and opportunities for marine fisheries mitigation associated with windfarms: Summary report for COWRIE contract FISHMITIG09. COWRIE Ltd, c/o Nature Bureau, Newbury, UK. 8pp.

Centre for Environment, Fisheries and Aquaculture Science (Cefas), (2012). Guidelines for data acquisition to support marine environmental assessments of offshore renewable energy projects. Contract report: ME5403.

Convention on the International Regulations for Preventing Collisions at Sea (COLREGs), 1972.

Defra, (2014). East Inshore and East Offshore Marine Plans. [online] Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/312496/east-plan.pdf [Accessed October 2022].

Defra, (2022). Managing flyseine vessel pressure on demersal Non-Quota Species Proposals for introducing technical measures in English waters.

Department for Business, Enterprise and Regulatory Reform (BERR), (2008). Fisheries Liaison with Offshore Wind and Wet Renewables Group (FLOWW) Recommendations For Fisheries Liaison: Best Practice guidance for offshore renewable developers.

DESNZ (2023a) Overarching National Policy Statement for Energy (EN-1). Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1147380/NPS_EN-1.pdf [Accessed: Mar 2023]

DESNZ (2023b) National Policy Statement for Renewable Energy Infrastructure (EN-3) Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1147382/NPS_EN-3.pdf [Accessed: Mar 2023]

Eastern IFCA, (2023). Wash Interim Measures Cockle Fishery 2023 – Exemption conditions (updated 10 July 2023). [online] 2023_07_10_Exemption_Conditions_Full_Opening_Clean_Full_Set.pdf (eastern-ifca.gov.uk) [Accessed: January 2024].

European Commission, (2023). Updates to Commission proposal for a Council Regulation amending Regulation (EU) 2023/194 of 30 January 2023 fixing for 2023 the fishing opportunities for certain fish stocks, applicable in Union waters, for Union fishing vessels, in certain non-Union waters, as well as fixing for 2023 and 2024 such fishing opportunities for certain deep-sea fish stocks [COM(2023) 114]. [online] https://oceans-and-fisheries.ec.europa.eu/system/files/2023-03/2023-03-15-non-paper-updates-2023-fishing-opportunities-regulation-com-114-sandeel_en.pdf [Accessed: March 2023].

European Subsea Cable Association (ESCA), (2018). European Subsea Cable Association Statement on vessels operating in the vicinity of subsea cables.

European Union Data Collection Framework (EU DCF) database, (2020). Data by quarter-rectangle: Tables and maps of effort and landings by ICES statistical rectangles for 2012 to 2016. [online] Available at: https://stecf.jrc.ec.europa.eu/web/stecf/dd/effort/graphs-quarter [Accessed October 2022].

Fisheries Liaison with Offshore Wind and Wet Renewables group FLOWW, (2015). FLOWW Best Practice Guidance for Offshore Renewables Developments: Recommendations for Fisheries Disruption Settlements and Community Funds.

Fisheries Liaison with Offshore Wind and Wet Renewables group FLOWW, (2014). FLOWW Best Practice Guidance for Offshore Renewables Developments: Recommendations for Fisheries Liaison. January 2014.

Gray, M., Stromberg, P-L., Rodmell, D., (2016). 'Changes to fishing practices around the UK as a result of the development of offshore windfarms – Phase 1 (Revised).' The Crown Estate, 121 pages. ISBN: 978-1-906410-64-3

International Cable Protection Committee, (2009). Fishing and Submarine Cables - Working Together.

KIS-ORCA. Reducing Risks Whilst Fishing. [Online]. Available at: https://kis-orca.org/safety/reducing-risks-whilst-fishing/ [Accessed January 2023].

Marine Management Organisation (MMO), (2022). IFISH database with landing statistics data for UK registered vessels for 2016 to 2020 with attributes for: landing year; landing month; vessel length category; country code; ICES rectangle; vessel/gear type; species; live weight (tonnes); and value; and landing year; landing month; vessel length category; country code; vessel/gear type; port of landing; species; live weight (tonnes); and value.

Marine Management Organisation (MMO), (2023). IFISH database with landing statistics data for UK registered vessels for 2018 to 2022 with attributes for: landing year; landing month; vessel length category; country code; ICES rectangle; vessel/gear type; species; live weight (tonnes); and value; and landing year; landing month; vessel length category; country code; vessel/gear type; port of landing; species; live weight (tonnes); and value.

MMO (2021a). Fishing data collection, coverage, processing and revisions. Available at: https://www.gov.uk/guidance/fishing-activity-and-landings-data-collection-and-processing [Accessed March 2023].

MMO, (2021b). Inner Dowsing, Race Bank and North Ridge Special Area of Conservation (SAC) Marine Management Organisation Fisheries Assessment.

MMO, (2023). MMO De Minimis Assessment: Marine Protected Areas Bottom Towed Fishing Gear Byelaw 2023.MMO. Formal Consultation - MMO management of fishing activity impacts in marine

protected areas - Stage 2. [Online]. Available at: https://consult.defra.gov.uk/mmo/stage-2-formal-consultation/ [Accessed January 2023]

RenewableUK, (2013). Cumulative impact assessment guidelines, guiding principles for cumulative impacts assessments in offshore windfarms.

Roach, M, Revill, A and Johnson, M, (2022). Co-existence in practice: a collaborative study of the effects of the Westermost Rough offshore wind development on the size distribution and catch rates of a commercially important lobster (*Homarus gammarus*) population. ICES Journal of Marine Science, 2022, 0, 1–12.

Roach, M., M. Cohen, R. Forster, A.S. Revill, and M. Johnson, (2018). The effects of temporary exclusion of activity due to windfarm construction on a lobster (*Homarus gammarus*) fishery suggests a potential management approach. ICES Journal of Marine Science 75(4):1,416–1,426.

Scottish Government (2022). Good Practice Guidance for Assessing Fisheries Displacement. Xodus. [Online]. Available at: https://www.gov.scot/binaries/content/documents/govscot/publications/research-and-analysis/2022/06/good-practice-guidance-assessing-fisheries-displacement-licensed-marine-activities/documents/good-practice-guidance-assessing-fisheries-displacement-licensed-marine-activities/good-practice-guidance-assessing-fisheries-displacement-licensed-marine-activities/govscot%3Adocument/good-practice-guidance-assessing-fisheries-displacement-licensed-marine-activities.pdf [Accessed April 2023].

The Planning Inspectorate (2022). Transboundary screening undertaken by the Planning Inspectorate (The Planning Inspectorate) on behalf of the Secretary of State (SoS) for the purposes of Regulation 32 of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the 2017 EIA Regulations).

The Planning Inspectorate (PINS), (2019). Advice Note Seventeen: Cumulative effects assessment relevant to nationally significant infrastructure projects (Version 2). [online] Available at: https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-17/ [Accessed January 2023].

UK Fisheries Economic Network and Seafish, (2012). Best Practice Guidance for Fishing Industry Financial and Economic Impact Assessments.

UK Hydrographic Office (UKHO) (2020), The Mariner's Handbook (NP100), 12th Edition.

UK Oil and Gas, (2015). Fisheries Liaison Guidelines - Issue 6.