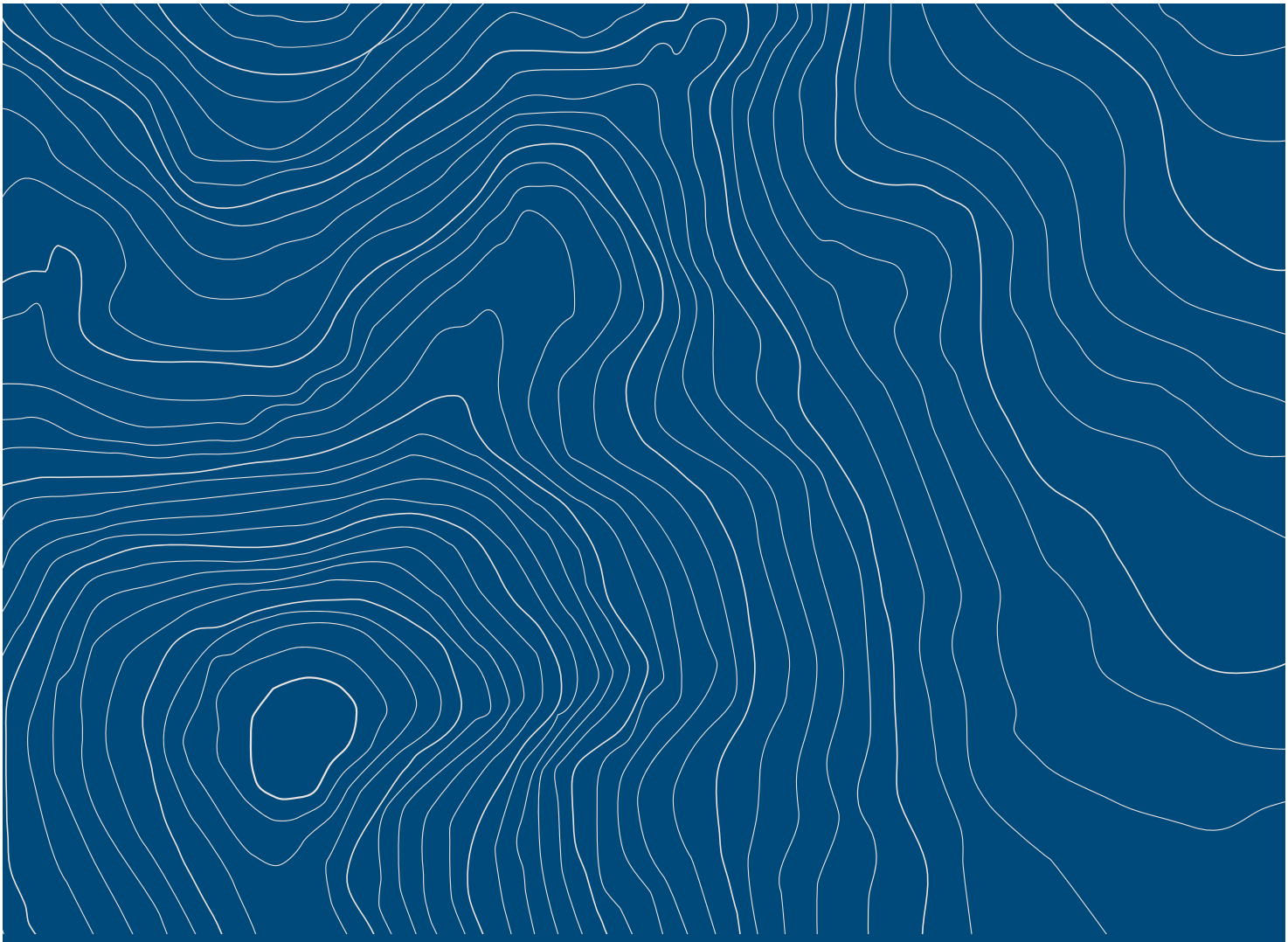

DublinArray
Generation for generations

EIAR Volume 3: Offshore Infrastructure Assessment Chapters
Chapter 9: Commercial Fisheries

Kish Offshore Wind Ltd.

RWE SLR GoBe APEM Group

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Dublin Array Offshore Wind Farm

Environmental Impact Assessment Report

Volume 3, Chapter 9: Commercial Fisheries

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Glossary

Term	Definition
Array Area	That part of the maritime area specified by MAC Reference 2022-MAC-003 and 004 within which it is proposed to locate the wind turbine generators (WTGs) and Offshore Substation Platform (OSP)
Demersal species	Demersal fish are species that live and feed on or near the seabed. Includes species such as haddock, cod, whiting and flatfish
Environmental impact assessment	Assessment of the likely significant effects of a proposed project on the environment. The EIA will be carried out by An Bord Pleanála in this instance.
Fisheries Management and Mitigation Strategy	The FMMS details and demonstrates how Dublin Array will deliver mitigation for each commercial fishery operating within the vicinity of Dublin Array
Offshore Export cable corridor (ECC)	The Offshore Export Cable Corridor (north and south route) (one corridor and two routes)
Maritime Area Consent (MAC)	State consent which grants the holder a right to occupy a specific part of the maritime area for the purposes of a proposed maritime usage as set out in the MAC and subject to such conditions (if any) as may be attached.
Pelagic	Pelagic fish are species which live and feed within the water column. Includes species such as herring, sprat and mackerel.
VMS	A vessel monitoring system is a form of satellite tracking system using transmitters on board fishing vessels.

Acronyms

Term	Definition
AIS	Automatic Identification System
BIM	Bord Iascaigh Mhara
DCCAE	Department of Communications, Climate Action and Environment
DCF	Data Collection Framework
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EPA	Environmental Protection Agency

Term	Definition
EU	European Union
FLO	Fisheries Liaison Officer
GIS	Geographic Information System
ICES	International Council for the Exploration of the Sea
MDO	Maximum Design Option
MMO	Marine Management Organisation
NMP	National Marine Planning
SFPA	Sea Fisheries Protection Agency
STECF	Scientific, Technical and Economic Committee for Fisheries
TAC	Total Allowable Catch
UK	United Kingdom
VMS	Vessel Monitoring System
WTG	Wind Turbine Generator

9 Commercial Fisheries

9.1 Introduction

9.1.1 This chapter presents the results of the Environmental Impact Assessment (EIA) for the potential impacts of the construction, operation and maintenance (O&M), and decommissioning phases in the array area and offshore Export Cable Corridor (the latter referred to as the Offshore ECC) on commercial fisheries resources and receptors.

9.1.2 For the purpose of this report, 'commercial fisheries' is defined as any form of fishing activity legally undertaken with catch sold for taxable profit.

9.1.3 This chapter should be read in conjunction with the following chapters due to the interactions between the technical aspects:

- Volume 3, Chapter 4: Fish and Shellfish Ecology (hereafter referred to the Fish and Shellfish Ecology chapter), which considers the ecology of fish and shellfish species, including species of commercial interest;
- Volume 3, Chapter 10: Shipping and Navigation (hereafter referred to the Shipping and Navigation chapter), which considers navigational aspects related to fishing vessels while in transit;
- Volume 3, Chapter 11: Marine Infrastructure and Other Users (hereafter referred to the Infrastructure and Other Users chapter), which considers aquaculture and charter angling (defined as fishing for marine species where the purpose is recreation and not sale or trade; and
- Volume 3, Chapter 17: Socio-economics (hereafter referred to the Socio-economics chapter), which includes consideration of impacts on people engaging in recreational fishing/angling and other businesses including processors.

9.1.4 The following appendices support this chapter by providing comprehensive descriptions of the commercial fisheries receiving environment:

- Volume 4, Appendix 4.3.9-1: Commercial Fisheries Technical Baseline (hereafter referred to the Commercial Fisheries Technical Baseline); and
- Volume 4, Appendix 4.3.4-2: A Fisheries survey of the Kish and Bray Banks (hereafter referred to Fisheries Study).

9.2 Regulatory background

9.2.1 The legislation, policy and guidance relevant to the whole Planning Application is set out in Volume 2, Chapter 2: Consents, Legislation, Policy & Guidance (hereafter referred to as the Policy Chapter). The principal legislation, policy and guidance relevant to this chapter is set out in Annex A.

9.2.2 This section outlines guidance specific to fisheries resources and management:

- Irish Guidance
  - Non-statutory Seafood / Offshore renewable Energy Engagement in Ireland: A summary guide (Seafood / ORE Working Group, 2023) (hereafter referred to as Seafood / ORE Guidelines, 2023);
- UK and International Guidance
  - Sea Fish Industry Authority and UK Fisheries Economic Network (UKFEN) (2012) Best practice guidance for fishing industry financial and economic impact assessments;
  - FLOWW Best Practice Guidance for Offshore Renewables Developments. Recommendations for Fisheries Liaison. FLOWW (Fishing Liaison with Offshore Wind and Wet Renewables Group) (2014);
  - FLOWW Best Practice Guidance for Offshore Renewables Developments: Recommendations for Fisheries Disruption Settlements and Community Funds. FLOWW (Fishing Liaison with Offshore Wind and Wet Renewables Group) (2015);
  - Blyth-Skyrme, R.E. (2010) Options and opportunities for marine fisheries mitigation associated with wind farms. Final report for Collaborative Offshore Wind Research into the Environment contract FISHMITIG09. COWRIE Ltd, London; and
  - Blyth-Skyrme (2010) Developing guidance on fisheries Cumulative Impact Assessment for wind farm developers.

9.2.3 Of particular relevance is the National Marine Planning Framework (NMPF) (Department of Housing, Local Government and Heritage, 2021) which provides specific policies for fisheries in the context of marine developments. Where significant adverse impact on access for existing fishing activities occurs, it must be demonstrated that proposals will (in order of preference) avoid, minimise or mitigate such impacts (Fisheries Policy 1), and where significant impacts are identified, a Fisheries Management and Mitigation Strategy (FMMS) should be prepared (Fisheries Policy 2). In addition, it should be demonstrated that optimised use of marine space has been considered, including through opportunities for co-existence and co-operation with other activities and enhancing other activities where appropriate (Co-existence Policy 1).

9.2.4 The relevance of specific policies or guidance including those captured within the Policy Chapter and their key provisions with regard to commercial fisheries and how these have been addressed within this assessment are presented in Annex A.

9.3 Consultation

9.3.1 The Seafood/ORE Engagement in Ireland– A Summary Guide (Department of Housing, Local Government and Heritage, 2023) provides key principles for engagement with the fisheries sector in Ireland. These principles include:

- Finding a balance between protecting seafood interests, responding to the global climate emergency, and meeting the State's legal obligations for reductions in carbon emissions as set out in the Climate Action Plan 2024;
- Encouraging the principle of co-existence, where the seafood and offshore renewable energy industries can work side-by-side in a manner that respectfully shares the marine space;
- Cooperating to determine the impact, effect, and opportunities that ORE proposals may have on seafood activity and working together to avoid, minimise, or mitigate any adverse impacts;
- Early and ongoing engagement between the sectors, including open sharing of information, honest and transparent communication, and cooperation to achieve sustainable outcomes that benefit both industries and Ireland's economy, society, and coastal communities;
- Mutual respect, best endeavours to reach agreement, and recognition of the importance of both sectors, which is critical to effective engagement; and
- Overall encouragement for mutual respect, cooperation, and proactive engagement between the sectors.

9.3.2 The Applicant has extensively engaged with the fishing industry since the Maritime Area Consent was awarded in 2019. Engagement and liaison efforts are in line with recommendations within the Seafood/ORE Guide.

9.3.3 Full details of liaison and engagement between the Applicant and the fishing industry can be found in Appendix 2 of Volume 7, Appendix 3: Fisheries Mitigation and Management Strategy (FMMS) of the EIAR. Selected points of this engagement include:

- In May 2019 the project appointed Mr. Mike Fitzpatrick as Fisheries Liaison Officer (FLO);
- The first public meetings with fishermen were held in October 2019 in Wicklow and Dún Laoghaire;
- In early 2020 there were meetings with and calls to processors regarding accessing overall landings data to improve on the SFPA data;
- Between July 2020 and February 2021 negotiations between RWE, solicitors representing fishermen and individual fishermen were held to develop co-operation agreements for planned surveys;
- The first meeting of a Dublin Array Commercial Fisheries Working Group (CFWG) was held in August 2022;
- A second CFWG meeting was held in February 2023;

- In January 2024 Seafood Representative Organisations were contacted to invite attendance at a project update meeting to discuss new information available about the project, intentions to carry out site investigation surveys in 2024 and to provide an opportunity for feedback on the FMMS approach; and
- In March 2024 local fishers were contacted as a part of the CFWG to invite attendance at a project update meeting to discuss new information available about the project, intentions to carry out site investigation surveys in 2024 and to provide an opportunity for feedback on the FMMS approach.

9.3.4 The Applicant submitted a Dublin Array EIA Scoping Report (RWE, 2020) in September 2020, which was disseminated to statutory and non-statutory consultees and generally made publicly available. The Dublin Array EIA Scoping Report (RWE, 2020) 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 1 sets out the comments received and how these have been addressed in this EIAR.

9.3.5 . In addition to direct contact with fishers and their representatives since 2019, the applicant has had consultations with statutory consultees in the fishing sector. A summary of the informal engagement undertaken is outlined in this section. Informal engagement is ongoing at the time of EIAR preparation and will continue throughout the development of Dublin Array.

Table 1 Summary of consultation relating to commercial fisheries

Date	Consultation type	Consultation and key issues raised	Response and Section where addressed
30 October 2019	Meeting with Bord Iscagh Maragh (BIM)	Details of the fisheries present in the district were provided. Opportunities for fisheries community funding were suggested.	Additional mitigation and the Applicant's approach to community funding related to fisheries is provided in the FMMS.
30 October 2019	Meeting with Sea Fisheries Protection Agency (SFPA) and Marine Institute	The SFPA representative joined the fishery survey concluding that the survey met its objectives and highlighted the areas importance as nursery grounds for several species. The key commercial species fished in the area is whelk. It is noted that mussel seed is harvested from the Kish and Bray Banks.	The receiving environment characterization of fish ecology, including spawning and nursery grounds, is provided in the Fish and Shellfish Ecology Chapter. The commercial fisheries impact assessment, including the whelk fishery and mussel seed harvesting is presented in Section 9.13 to 9.15.
October 2020	Marine Institute response to Dublin Array EIA Scoping Report (RWE, 2020)	International Council for the Exploration of the Sea (ICES) have established a number of expert groups whose sole function is to assist with planning of marine wet renewables and to assess the interactions between wet renewables and marine features (e.g., benthos and fisheries). Outputs and reports from these groups will be a useful source of information.	ICES stock assessment and relevant working group papers have been reviewed to inform the Commercial Fisheries Technical Baseline (Volume 4 ,Appendix 4.3.9-1)
		It was recommended that reference is made to the Shellfish Review 2019 for razor clams and whelk; and in addition the Marine Atlas for information on distribution of fisheries by vessels under 12 m in length.	The latest Marine Institute Stock Book, Shellfish Review and Marine Atlas have been reviewed and considered within the Commercial Fisheries Technical Baseline (Volume 4, Appendix 4.3.9-1) and receiving environment characterization (Section 9.6).
		Greater clarity was sought in relation to consultation related to undertaking the 2019 trawl survey on the Kish Bank.	The Fisheries Study (Appendix 4.3.4-2) was advised during a joint meeting with the Sea Fisheries Protection Authority (SFPA) and Marine Institute.
		Concern was raised in relation to the sufficiency of data on distribution of species with suggestion of additional surveys using a variety of fishing or sampling gears to improve spatial data on these species. It was noted that highly resolved	A comprehensive desk-based study has identified all relevant data sources that are available pertaining fish and shellfish ecology (see the Fish and Shellfish Ecology Chapter) and to commercial fishery effort and distribution (see the Commercial Fisheries Technical Baseline). Consultation with fishing industry

Date	Consultation type	Consultation and key issues raised	Response and Section where addressed
		hydrodynamic modelling and predictions of sediment transport and plumes have been obtained, while the resolution of the fish and shellfish data is much coarser yet, relatively easy to obtain in comparison. Furthermore, it was queried whether contaminants sampling of sediments prior to works particularly close to and in Dublin Bay would be undertaken.	has been ongoing facilitated by the appointment of a Fishery Liaison Officer. Where possible, data has been assessed in context of the wider Irish Sea. Contaminant sampling has been undertaken to validate the assumptions of types and levels of contaminants present based on historical data analysis and literature reviews within the proposed development (see Volume 3, Chapter 2: Marine Water and Sediment Quality).

9.4 Methodology

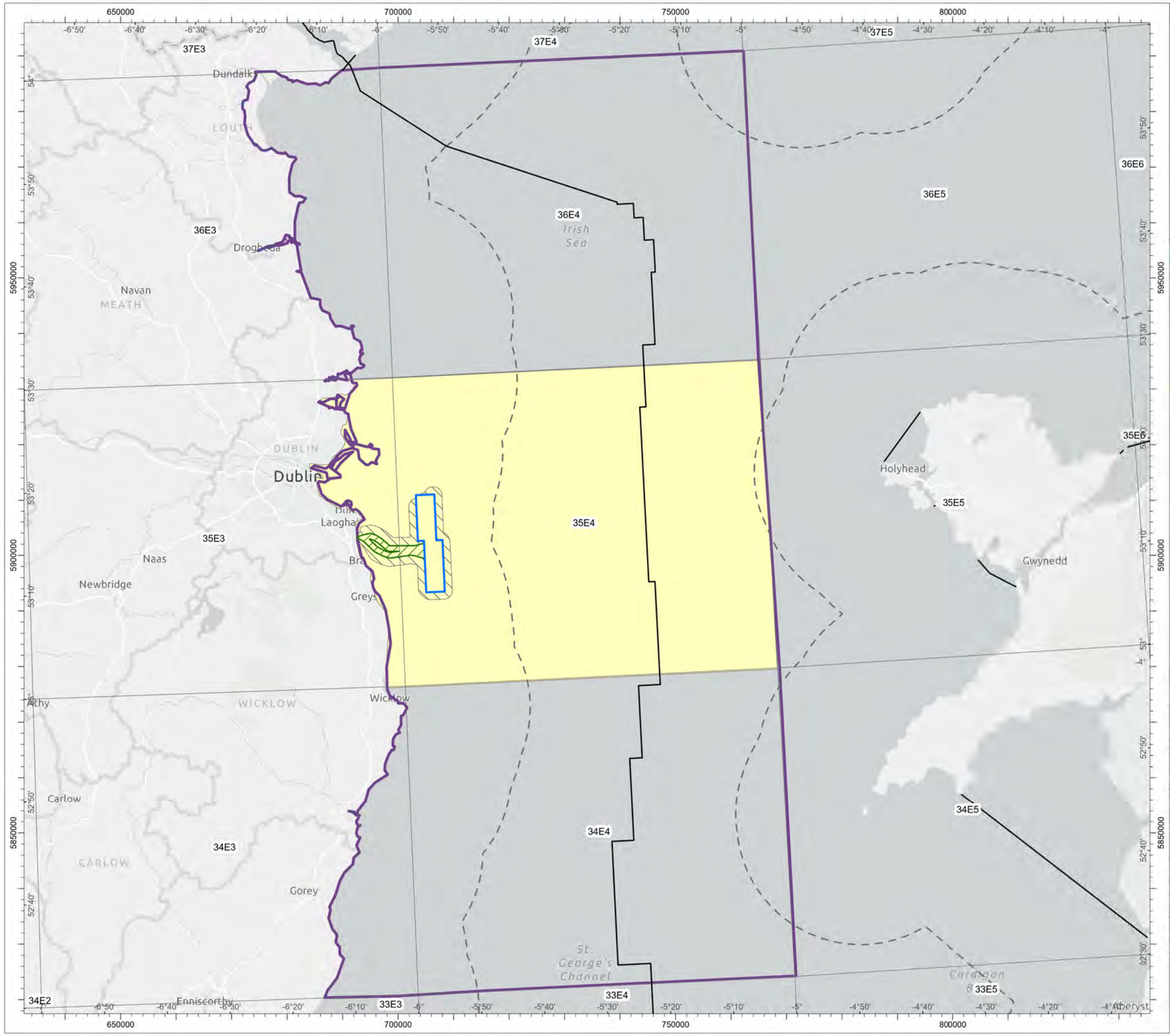
9.4.1 For a full description of the methodology as to how this EIAR was prepared, see Volume 2, Chapter 3: EIA Methodology Chapter (hereafter referred to as the EIA Methodology Chapter). The methodology that follows below is specific to this chapter.

Study area

9.4.2 Dublin Array is located within the southern portion of the ICES Division 7a (Irish Sea) statistical area; within Ireland Exclusive Economic Zone (EEZ) waters. Dublin Array is fully located inside of 12 NM territorial seas limit. For the purpose of recording fisheries landings, ICES Division 7a is divided into statistical rectangles which are used as bounding areas for the calculation of fish statistics by all Member States operating in the Irish Sea.

9.4.3 The array area is located within ICES rectangle 35E4 and the Offshore ECC (including two routes) is located within ICES rectangles 35E4 and 35E3, which together represent the commercial fisheries local study area, as shown in Figure 1. Note that the array area and the Offshore ECC occupy only a portion of these ICES rectangles.

9.4.4 The receiving environment for commercial fisheries is described in relation to this commercial fisheries local study area (ICES rectangles 35E4 and 35E3). In order to understand fishing activity in the wider area and to inform potential displacement impacts, baseline data has also been gathered and analysed for a commercial fisheries regional study area (ICES rectangles 34-36E4 and 34-36E3). In addition, the cumulative effects study area is defined as the Irish Sea (ICES Division 7a) (see Section Environmental assessment: cumulative effects).



DRAWING STATUS

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PROJECT TITLE

Dublin Array

DRAWING TITLE

Commercial Fisheries Study Areas

DRAWING NUMBER: 1

PAGE NUMBER: 1 of 1

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DATUM WGS 1984 VERTICAL REF LAT
PRJ WGS 1984 UTM Zone 29N

nima CONSULTANTS

Dublin Array Generation for generations

Kish Offshore Wind Limited - Bray Offshore Wind Limited

Baseline data

9.4.5 Baseline data collection has been undertaken to obtain information over the study areas described above.

9.4.6 The data sources that have been collected and used to inform this commercial fisheries assessment are summarised in Table 2. As well as Irish data sources, data has been sourced from other European fisheries bodies, including the UK. Relevant literature from a number of additional sources has also been reviewed and is appropriately referenced throughout this chapter. Of particular note is the Marine Institute (2024) Atlas of Commercial Fisheries around Ireland, the Marine Institute and BIM (2023) Shellfish Stocks and Fisheries Review and the Marine Institute (2023) Stock Book.

9.4.7 Landings statistics for Irish registered vessels were obtained from the SFPA with the following parameters: year; gear type; ICES rectangle; species; live weight (kg) and first sales value (€) across a seven-year period (2015 to 2022).

9.4.8 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 has been collated for all EU Member States for the ICES statistical rectangle that overlap the Dublin Array commercial fisheries study area. Landing statistics were collated across five years (2012 to 2016), noting that data post 2016 has not been available by ICES rectangle from this source and that the 2012 to 2016 dataset informs pre-Brexit baseline. Nevertheless, Irish data was sourced from the SFPA. 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).

9.4.9 Vessel Monitoring System (VMS) is a form of satellite tracking using transmitters on board fishing vessels. Annual VMS data are available through ICES for all vessels 12 m and over in length registered to EU Member States, including all mobile gear types. VMS data for EU vessels (including UK) have been analysed for 2016 to 2020, which represents the most-up-to-date VMS data available at the time of writing.

9.4.10 In addition to fisheries dependant data, a targeted fisheries survey was undertaken of the Kish and Bray Banks in July 2019, in order to survey fish and shellfish assemblages, including those that may not be represented within landing statistics. This survey was undertaken by Aquafact (2019), further details are provided in Commercial Fisheries Technical Baseline (Appendix 4.3.9-1) and Fisheries Study (Appendix 4.3.4-2).

9.4.11 Data limitations and uncertainties are comprehensively detailed in Section 5 of Commercial Fisheries Technical Baseline.

Table 2 Data sources considered in the development of commercial fisheries receiving environment

Data source	Type of data	Temporal and spatial coverage
Landing statistics		
Sea Fisheries Protection Agency (SFPA)	Landings statistics data for Irish-registered vessels, with data query attributes for: species, weight of landing (kg) and first sales value (€) at the following geographic scales: ▪ All ICES divisions ▪ Irish Sea (7a) indicating port of landing ▪ Irish Sea (7a) indicating ICES rectangle of catches.	2015-2022 Irish vessels All sea areas
Bord Iascaigh Mhara (BIM)	Business of Seafood reports including import and export data for whelk.	2015-2022 Irish vessels Irish imports and exports
Marine Institute and BIM	Estimates of annual landings (tonnes) and value (€) of crustacean and bivalve shellfish (excl. prawns and mussels) into Ireland 2004-2019 (source: Logbook declarations and sales notes for vessels under 10 m, gatherer dockets, co-op data).	2004-2023 Irish vessels All sea areas
Scientific, Technical and Economic Committee for Fisheries (STECF)	Landings statistics data for Irish-registered vessels landing whelk, with data query attributes for: year, vessel length category, landed weight (kg), first sales value (€), ICES division, gear type and species (whelk only).	2013-2022 Irish vessels All sea areas
European Union (EU) Data Collection Framework (DCF) database	Landings statistics for Irish, Belgian, Danish, Dutch, French, German and UK registered vessels with data query attributes for: landing year; landing quarter; ICES rectangle; vessel length; gear type; species; and, landed weight (tonnes)	2012-2016 All EU vessels Irish Sea
Marine Management Organisation (MMO)	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.	2015-2022 UK vessels Irish Sea

Data source	Type of data	Temporal and spatial coverage
Spatial data and Vessel Monitoring System (VMS) data		
Marine Institute	Polygon data showing the outer extent of fishing activity for potting vessels <15 m in length targeting inshore fishing grounds for various gear types and target species.	Irish vessels Irish Sea and wider Irish coast
Marine Institute	Fishing vessel effort data indicating high and low fishing effort. The data are available for all EU vessels of 12 m and larger, operating inside the Irish EEZ; outside this zone only Irish VMS data are routinely available within the data sets.	2014-2018 Irish vessels All sea areas
International Council for the Exploration of the Sea (ICES)	VMS data for EU vessels indicating time and value of fishing at a resolution of 1/200th of an ICES rectangle amalgamated for all mobile vessels for specific mobile gear.	2017 All EU vessels All sea areas
ICES	VMS data for EU registered vessels ≥12 m length. VMS data sourced from ICES displays the surface Swept Area Ratio (SAR) of catches by different gear types and covers EU (including UK) registered vessels 12 m and over in length. Surface SAR indicates the number of times in an annual period that a demersal fishing gear makes contact with (or sweeps) the seabed surface. Surface SAR provides a proxy for fishing intensity.	2017-2020 All EU vessels All sea areas
ICES	VMS polygon data showing the outer extent of historical king scallop fishing activity in the Irish Sea with individual jurisdiction for British, Northern Irish and Irish vessels.	UK and Isle of Man: 2009-2017; Northern Ireland: 2012-2016; and Ireland: 2012-2019 UK and Irish vessels Irish Sea
European Maritime Safety Agency (EMSA)	Fishing vessel route density, based on vessel Automatic Information System (AIS) positional data. AIS is required to be fitted on fishing vessels ≥15 m length.	2019-2023 EU vessels All sea areas
Marine Management Organisation (MMO)	VMS data for UK registered vessels ≥15 m length. Note that UK vessels ≥12 m in length have VMS on board, however, to date, the MMO provide amalgamated VMS datasets for ≥15 m vessels only. VMS data sourced from MMO displays the first sales value (£) of catches.	2016-2020 UK vessels All sea areas

Assessment methodology

9.4.12 The methodology follows statutory legislative requirements, including the National Marine Planning Framework (2021) Section 16: Fisheries. Specifically, the EIA for commercial fisheries assesses the occurrence of significant adverse impacts on access for existing fishing activities, and in doing so demonstrates possible avoidance, minimisation and mitigation, including through the use of project design, avoidance and preventative measures and the development of a FMMS.

9.5 Assessment criteria

9.5.1 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.

Sensitivity of receptor criteria

9.5.2 The definitions employed in assigning receptor sensitivity are provided in Table 3 and consider the following:

- Context – The degree to which the receptor will conform or contrast with the established (baseline) conditions. To define the context the following sub-factors will be considered:
  - Adaptability - The degree to which a receptor can avoid or adapt to an impact;
  - Tolerance -The ability of a receptor to accommodate temporary or permanent change without a significant adverse impact; and
  - Recoverability - The temporal scale over and extent to which a receptor will recover following an impact.
- Value - A measure of the receptor's importance, rarity and worth.

Table 3 Sensitivity/ importance of the environment

Receptor sensitivity	Definition
High	**Adaptability:** No alternative fishing grounds are available and/or the fishing fleet has very low operational range outside the project area. **Tolerance:** Receptor is highly vulnerable to impacts that may arise from Dublin Array. **Recoverability:** Recoverability is long term or not possible. **Value:** The receptor is of very high socio-economic value.
Medium	**Adaptability:** Low levels of alternative fishing grounds are available and/or the fishing fleet has low operational range. **Tolerance:** Receptor is generally vulnerable to impacts that may arise from Dublin Array. **Recoverability:** Recoverability is slow and/or costly.

Receptor sensitivity	Definition
	Value: The receptor is of high socio-economic value.
Low	**Adaptability:** Moderate levels of alternative fishing grounds are available and/or fishing fleet has moderate operational range. **Tolerance:** Receptor is somewhat vulnerable to impacts that may arise from Dublin Array. **Recoverability:** Moderate to high levels of recoverability. **Value:** The receptor is of medium socio-economic value.
Negligible	**Adaptability:** High levels of alternative fishing grounds are available and/or fishing fleet has large to extensive operational range. **Tolerance:** Receptor is not generally vulnerable to impacts that may arise from Dublin Array and the fishing fleet is resilient to change. **Recoverability:** High or very high levels of recoverability. **Value:** The receptor is of low socio-economic value.

Magnitude of impact criteria

9.5.3 The definitions for magnitude consider the following, in line with the EPA Guidelines (2022):

- Extent - The area, the number of sites and/ or the proportion of a population affected over which an impact occurs;
- Duration - The time for which the impact occurs;
- Frequency - How often the impact occurs;
- Probability - How likely the impact is to occur; and
- Consequences - The degree of change relative to the baseline level and the change in character.

9.5.4 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 the level of consequence within the categories of high, medium or low. Instead, these classifications were based on judgement informed by the receiving environment characterisation and consultation with the industry. The definitions for each category of magnitude are defined in Table 4.

Table 4 Magnitude of the impact

Magnitude	Definition
High	**Extent:** Impact is of extended physical extent. **Duration:** Impact is permanent (i.e. over 60 years), or of long-term (i.e., 15 to 60 years) or medium-term (i.e., seven to fifteen years) duration. **Frequency:** The impact will occur continuously and constantly throughout the relevant project phase. **Probability:** The impact is highly likely to occur. **Consequences (adverse):** Impact is expected to result in one or more of the following:

Magnitude	Definition
	▪ Substantial loss of target fish or shellfish biological resource (e.g., loss of substantial proportion of resource within project area); and ▪ Substantial loss of ability to carry on fishing activities (e.g., substantial proportion of effort within project area). **Consequences (positive):** 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; and ▪ Extensive restoration or enhancement of habitats supporting commercial fisheries resources.
Medium	**Extent:** Impact is of moderate physical extent. **Duration:** Impact is of short-term duration (i.e., one to seven years). **Frequency:** The impact will occur regularly throughout the relevant project phase. **Probability:** The impact is likely to occur. **Consequences (adverse):** 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); and ▪ Partial loss of ability to carry on fishing activities (e.g., moderate reduction of fishing effort within project area). **Consequences (positive):** Impact is expected to result in one or more of the following: ▪ Moderate improvement of resource quality; and ▪ Moderate restoration or enhancement of habitats supporting commercial fisheries resources.
Low	**Extent:** Impact is of limited physical extent. **Duration:** Impact is temporary (e.g., less than one year). **Frequency:** The impact will occur intermittently throughout the relevant project phase. **Probability:** The impact may occur. **Consequences (adverse):** 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); and ▪ Minor loss of ability to carry on fishing activities (e.g., minor reduction of fishing effort within project area). **Consequences (positive):** Impact is expected to result in one or more of the following: ▪ Minor benefit to or minor improvement of resource quality; and ▪ Minor restoration or enhancement of habitats supporting commercial fisheries resources.
Negligible (neutral)	**Extent:** Impact is of negligible physical extent. **Duration:** Impact is brief (i.e., less than one day) or momentary (i.e., lasting seconds to minutes). **Frequency:** The impact will occur infrequently throughout the relevant project phase. **Probability:** The impact is unlikely to occur. **Consequences:** Impact is expected to result in one or more of the following: ▪ No discernable loss of target fish or shellfish biological resource (e.g., No discernable loss of resource within project area); and

Magnitude	Definition
	▪ No discernable loss of ability to carry on fishing activities (e.g., No discernable loss of fishing effort within project area).

Defining the significance of effect

9.5.5 The significance of the effect upon commercial fisheries is determined by correlating the magnitude of the impact and the sensitivity of the receptor, using the matrix presented in Table 5.

9.5.6 For this assessment, any effects with a significance level of Slight or less have been concluded to be not significant in EIA terms. Any effects assessed as Significant or Very Significant are concluded to be significant in EIA terms. For effects assessed as being of Moderate significance expert judgment has been applied to determine whether the effect is considered significant in EIA terms.

Table 5 Significance of potential effects

			Existing Environment - Sensitivity			
			High	Medium	Low	Negligible
Description of Impact - Magnitude	Adverse impact	High	Profound or Very Significant (significant)	Significant	Moderate	Imperceptible
		Medium	Significant	Moderate*	Slight	Imperceptible
		Low	Moderate	Slight	Slight	Imperceptible
	Neutral impact	Negligible	Not significant	Not significant	Not significant	Imperceptible
	Positive impact	Low	Moderate	Slight	Slight	Imperceptible
		Medium	Significant	Moderate	Slight	Imperceptible
		High	Profound or Very Significant (significant)	Significant	Moderate	Imperceptible

* Effects deemed to be of Moderate significance have the potential to be significant in EIA terms, subject to the assessor's professional judgement. Moderate effects are determined to be significant or not significant in EIA terms, depending on the sensitivity and potential magnitude of change. These evaluations are explained as part of the assessment, where they occur.

9.6 Receiving environment

9.6.1 This section presents the existing receiving environment for commercial fisheries, using the most recent datasets available at the time of writing (2015-2022 for SFPA data, 2015-2022 for BIM data, 2004-2023 for Marine Institute and BIM data, 2012-2016 for EU DCF data; 2015-2022 for MMO data; and 2016-2020 for ICES VMS data).

9.6.2 This section provides an overview of all landings from the commercial fisheries local study area (i.e., ICES rectangles 35E3 and 35E4), followed by analysis of the array area and export cable corridors on a fishery-by-fishery basis, where details on the nationality of vessels, species caught, and location of fishing activity is provided.

9.6.3 A technical report has been prepared to provide a detailed characterisation of the receiving baseline for commercial fisheries, including for the commercial fisheries local and regional study areas. A review of the key findings from that study has been incorporated into the description of the receiving environment. The Commercial Fisheries Technical Baseline Report (Volume 4, Appendix 4.3.9-1) provides further details on target species and fishing vessel and gear characteristics, as well as comprehensively profiling the fisheries activity in the local and regional study areas and wider region of the Irish Sea. Full details of the data sources analysed, including the sourcing process and data limitations, are provided in Commercial Fisheries Technical Baseline Report. The Commercial Fisheries Technical Baseline Report also describes other pressures which may impact the future receiving environment including market demand, market price fluctuations, changes in stock abundance, fisheries management measures, gear technology, climate change and environmental management measures.

Commercial fisheries landings by port

9.6.4 Landings by Irish vessels from the Irish Sea are presented by species and port of landing in Figure 2 by weight and by first sales value in Figure 3.

9.6.5 The key fishing ports/harbours located in the vicinity of Dublin Array are (from north to south): Howth, Dún Laoghaire, Greystones, Wicklow, Arklow and Kilmore Quay. Landings by Irish vessels into these ports in 2022 are presented by species weight in Figure 2 and by first sales value in Figure 3. The key species landed into these ports are as follows:

- Howth; nephrops, whelk, king scallop, queen scallop and velvet crab;
- Dún Laoghaire: whelk, brown crab, velvet crab and lobster;
- Greystones: whelk, brown crab, velvet crab and lobster;
- Wicklow: whelk;
- Arklow: whelk; and
- Kilmore Quay: brown crab, lobster and king scallop.

9.6.6 Whelk landed from the Irish Sea by Irish registered vessels are not landed at any other ports in significant quantities. This demonstrates the high importance of the whelk fishery to vessels landing at Howth, Dún Laoghaire, Greystones, Wicklow and Arklow. Commercial fisheries landings into Dún Laoghaire, Wicklow and Arklow are almost entirely of whelk indicating the high dependence of vessels operating from these ports on the whelk fishery.

9.6.7 In 2022 landings of whelk by Irish vessels fishing in the Irish Sea had a total first sales value of €8.3 million (4,483 tonnes), with €4.5 million (2,583 tonnes) of this landed into Howth, Dún Laoghaire, Wicklow, Arklow and Kilmore Quay.

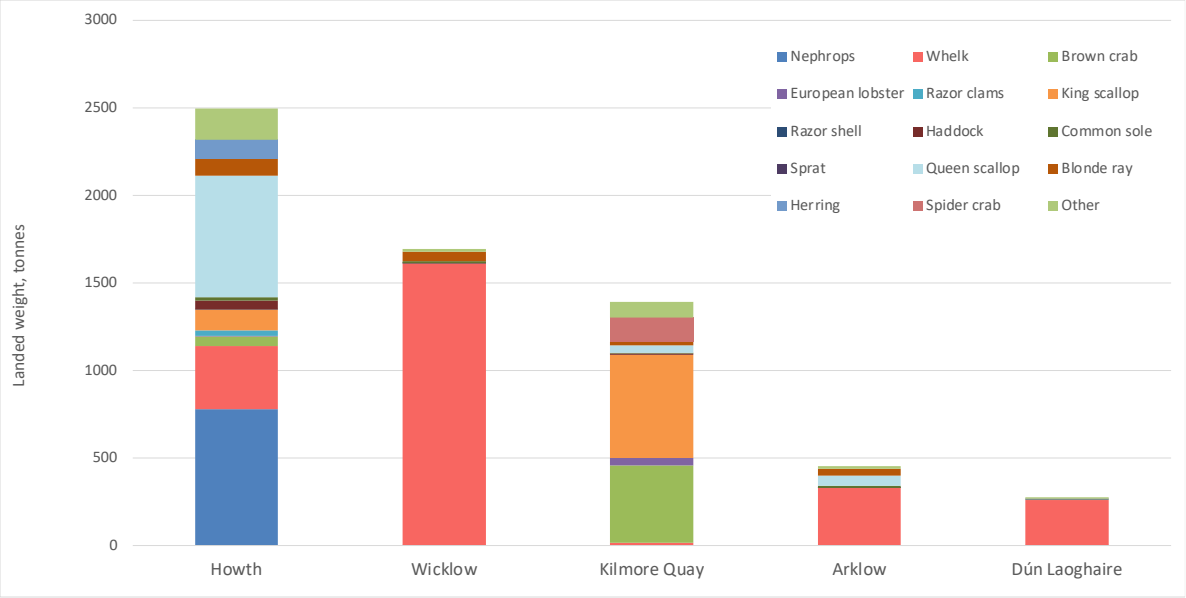


Figure 2 Irish vessel landings from the Irish Sea by port of landing and species in 2022 by weight[1]

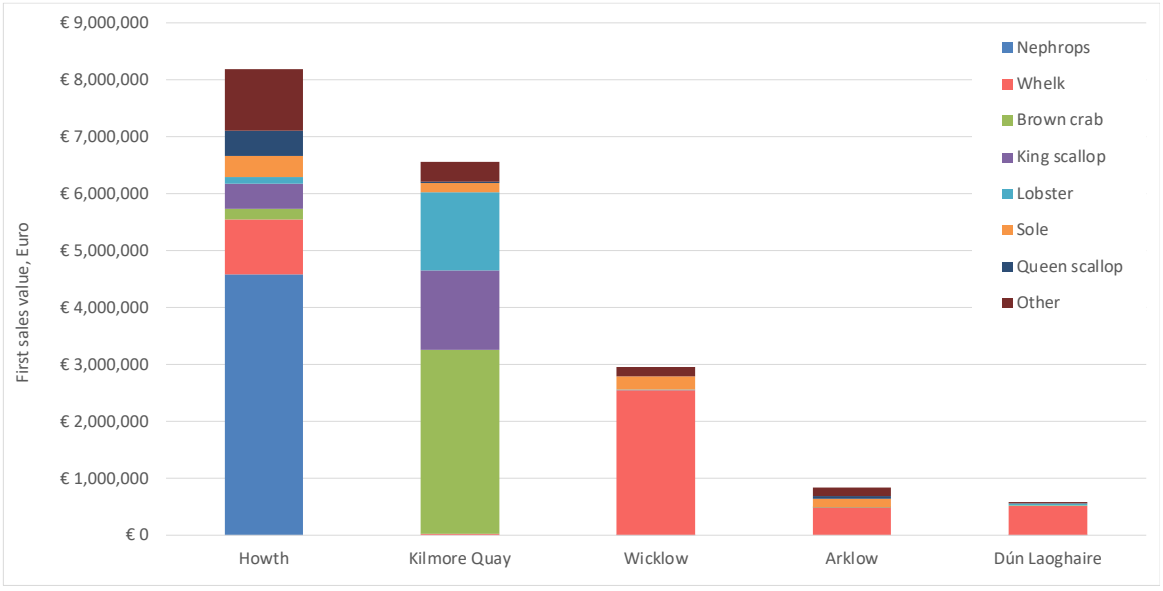


Figure 3 Irish vessel landings from the Irish Sea by port of landing and species in 2022 by first sales value[2]

[1] Source: SFPA, 2023
[2] Source: SFPA, 2023

Commercial fisheries local study area

Landings by Irish registered vessels

9.6.8 Landings by Irish vessels from the commercial fisheries local study area (ICES rectangles 35E3 and 35E4, as depicted in Figure 1) are presented for first sales value in Figure 4 and by landed weight in Figure 5 for the time period 2015 to 2019. Landings data by ICES rectangle are not available for 2020 onwards due to data availability.

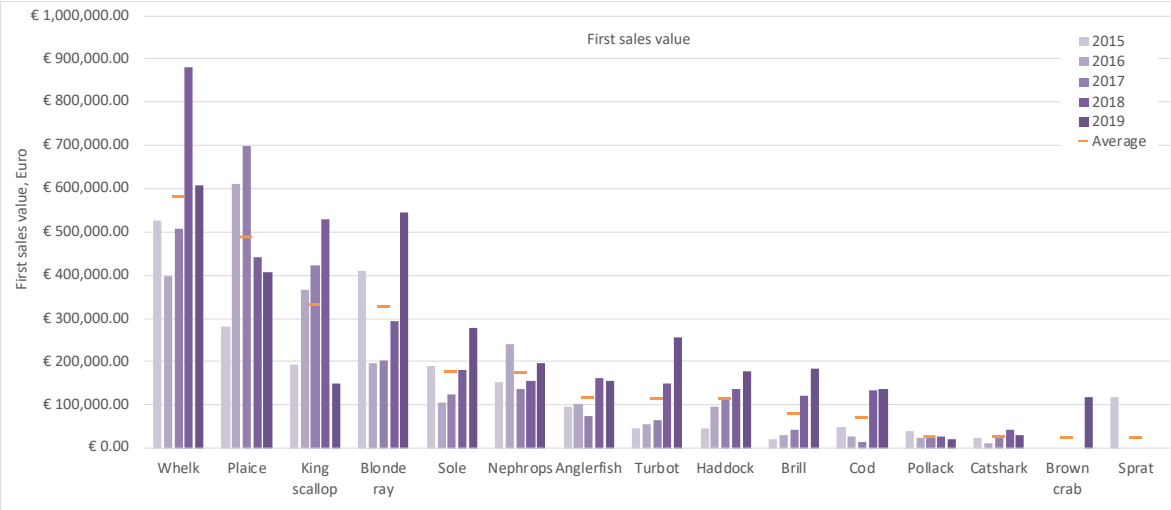


Figure 4 First sales value of landings (€) by Irish vessels taken from the commercial fisheries study area (35E3 and 35E4) from 2015 to 2019 by species[3]

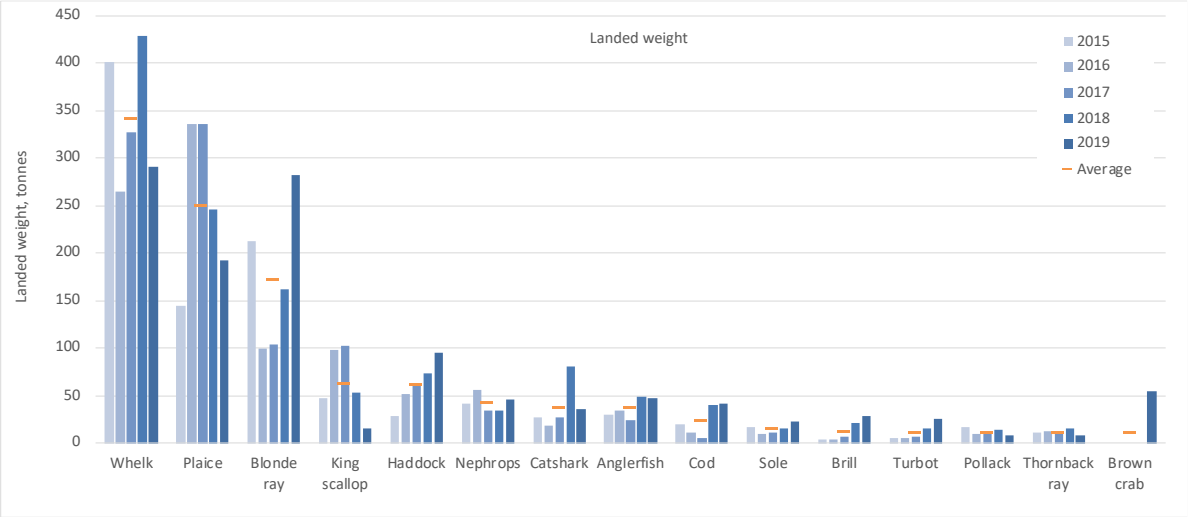


Figure 5 Weight of landings (tonnes) taken from the commercial fisheries study area (35E3 and 35E4) from 2015 to 2019 by species [note that 656 tonnes of sprat landed in 2015 has been removed due to the scale of the graph][4]

[3] SFPA, 2020
[4] Data source: SFPA, 2020

9.6.9 The statistics indicate that on average 350 tonnes of whelk, worth € 600,000 in first sales value is landed by Irish vessels from 35E3 and 35E4. Based on industry consultation (see Table 1), this is understood to underestimate true levels of whelk landings. This is corroborated by the landings data by port which indicates a value of €4.5 million landed into Howth, Dún Laoghaire, Wicklow, Arklow and Kilmore Quay (Figure 3).

9.6.10 Notable landings of plaice and sole are recorded in terms of value (€ 700,000) and weight (275 tonnes) from the local study area. This is expected to be mainly outside the 12 NM boundary in a beam trawl targeted fishery.

9.6.11 Other species of note include blonde ray (860 tonnes; € 330,000 value) and king scallops (63 tonnes, € 333,000 value), as well as mixed demersal species including nephrops, haddock, brill and cod.

Landings by EU Member State vessels

9.6.12 Landings by EU Member States from the commercial fisheries study area (35E3 and 35E4) is available from 2012-2016 as part of the Data Collection Framework (DCF, 2019). Figure 6 presents landings by species and nationality and Figure 7 presents landings by gear type and nationality. Uncertainties and data availability are described in the Commercial Fisheries Technical Baseline. It is noted that more up-to-date information on the spatial footprint of EU Member State vessels is available up to 2020 and presented in the Commercial Fisheries Technical Baseline. In addition data up to 2022 is presented for UK vessels, including Scottish, Northern Irish and English registered vessels.

9.6.13 Landings of queen scallop and king scallop by dredge and haddock by demersal trawl are reported for Northern Irish registered vessels. Landings of queen scallop by dredge are reported for Scottish vessels. Landings of plaice and blonde ray are reported for Belgium vessels. Negligible quantities are reported for all other nationalities.

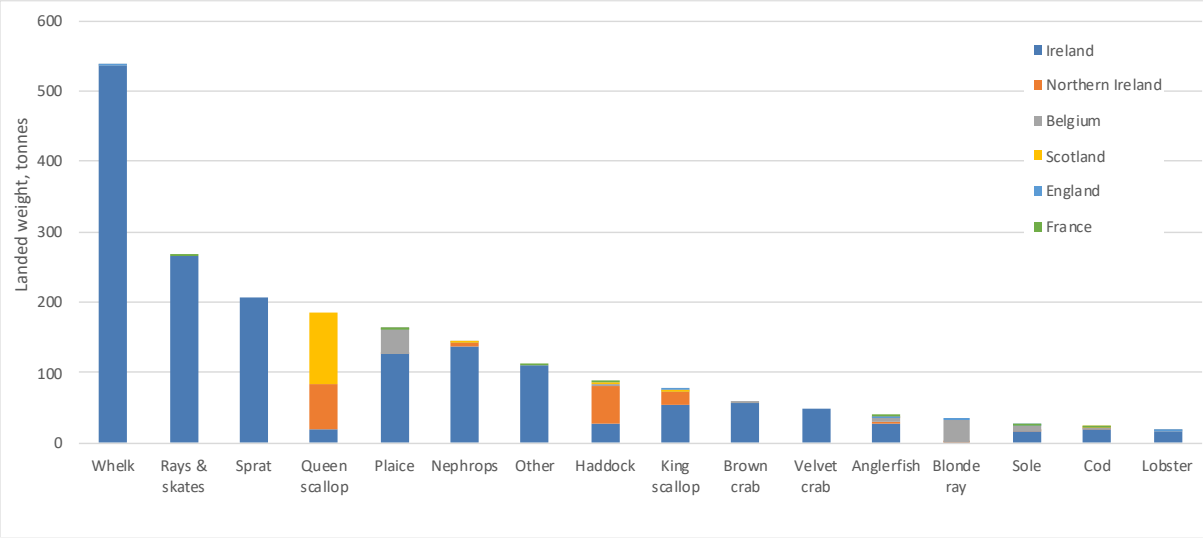


Figure 6 Average annual weight (tonnes) of landings by EU vessels (including UK) from 35E3 and 35E4, indicating species and nationality, based on five-year period from 2012-2016[5]

[5] Data source: EU DCF, 2019

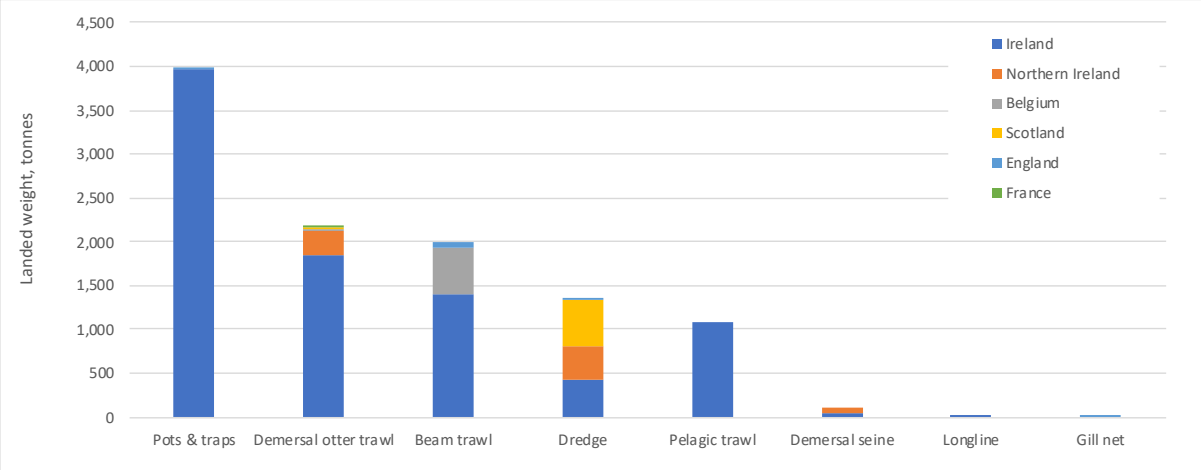


Figure 7 Average annual weight (tonnes) of landings by EU vessels (including UK) from 35E3 and 35E4, indicating gear type and nationality, based on five-year period from 2012-2016[5]

9.6.14 More recent data on landings by UK vessels is available for the period 2018 to 2022 for the commercial fisheries local study area (35E3 and 35E4) as presented in Figure 8, indicating landings of queen scallop, king scallop and haddock.

9.6.15 Landings of queen scallop peaked in 2020 with 1,800 tonnes relating to a first sales value of just under £800,000. Statistics indicate that 2019 and 2020 queen scallop landings were taken from ICES rectangle 35E4 by UK Scottish registered vessels, over 10 m in length, using dredge. The landings of queen scallop fluctuate greatly over the five-year period analysed, which corroborates knowledge on the operating patterns of vessels targeting this species.

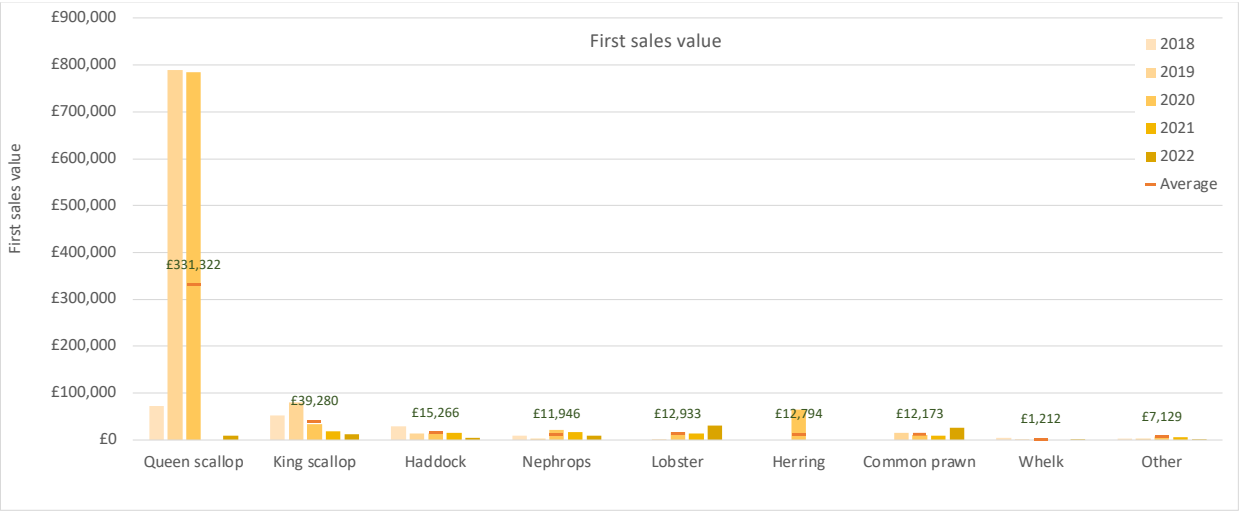


Figure 8 First sales value (£) of landings by UK vessel from 35E3 and 35E4 from 2018 to 2022[6]

[6] Data source: MMO, 2023

The array area

Potting fishery

9.6.16 The Applicant has been advised through consultation with the local fishing community that up to 25 whelk potting vessels fish within the array area and Offshore ECC as part of their typical fishing grounds, with an additional five potting vessels that target a mixture of whelk, brown crab and lobster. The extent of this fishing within the array area and Offshore ECC varies on a vessel by vessel basis. Potting vessels targeting whelk are typically 12 m and under, and based at home ports of Dún Laoghaire, Greystones, Wicklow and Arklow. Vessels targeting a mixture of whelk, crab and lobster are based at Dún Laoghaire and Howth.

9.6.17 Potting vessels targeting brown crab and lobster tend to be more prominent across the Offshore ECC, and less prominent across the array area, which is dominated by whelk pots. The distribution of whelk fishing grounds is presented in Figure 9.

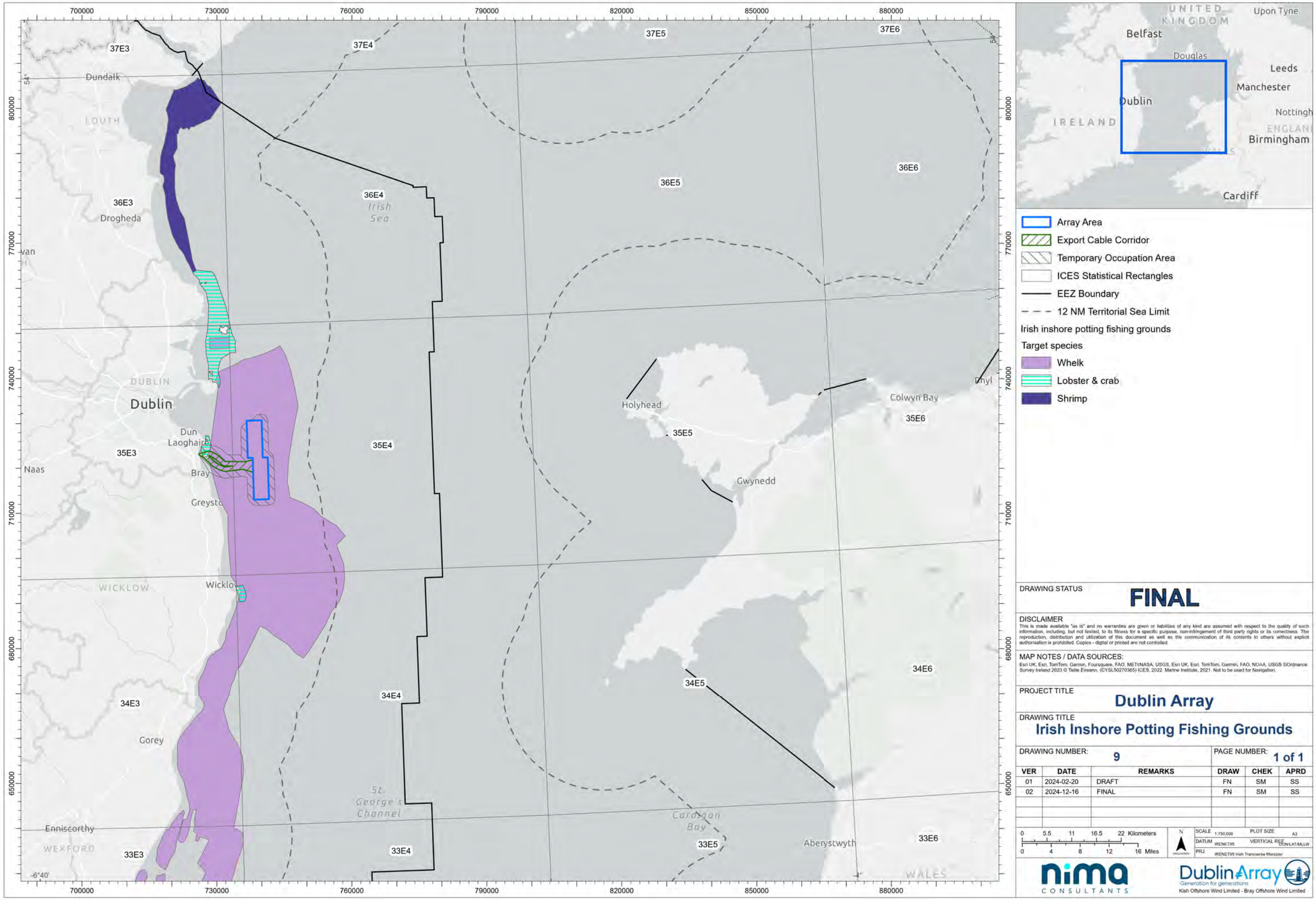
9.6.18 Whelk are fished in water depths between 0 and 30 m and areas where trawlers are active are generally avoided. Soak time for pots varies from daily to three to five days, or longer depending on weather conditions.

9.6.19 There is not a clearly defined whelk season as fishing occurs year-round but feedback from skippers indicates that catch rates are higher from December to June compared to July to November. The season for brown crab and lobster is approximately from March to October.

9.6.20 The distribution of potting grounds for Irish vessels under 15 m in length has been mapped by Marine Institute (2017) for different target species of whelk, lobster, crab and shrimp (Figure 9). Based on stakeholder consultation (see Section 9.3), the mapped areas are understood to be largely representative of the fishing grounds targeted, although they may extend further south for whelk.

9.6.21 Based on the fishing grounds mapped by the Marine Institute (2017) (Figure 9), the array area overlaps with 3.2% of the whelk fishing grounds that extend along the eastern Irish coast out to 12 NM.

9.6.22 A range of sources were analysed to inform the commercial fisheries activity across the region, which are summarised in Table 6 for whelk.



- Array Area
- Export Cable Corridor
- Temporary Occupation Area
- ICES Statistical Rectangles
- EEZ Boundary
- 12 NM Territorial Sea Limit

Irish inshore potting fishing grounds

Target species

- Whelk
- Lobster & crab
- Shrimp

DRAWING STATUS

FINAL

DISCLAIMER

MAP NOTES / DATA SOURCES:

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PROJECT TITLE

Dublin Array

DRAWING TITLE

Irish Inshore Potting Fishing Grounds

DRAWING NUMBER: **9**

PAGE NUMBER: **1 of 1**

VER	DATE	REMARKS	DRAW	CHEK	APRD
01	2024-02-20	DRAFT	FN	SM	SS
02	2024-12-16	FINAL	FN	SM	SS

0 5.5 11 16.5 22 Kilometers

0 4 8 12 16 Miles

SCALE 1:750,000 PLOT SIZE A3

DATUM IRENET95 VERTICAL REF CDN:LAT:MLLW

PRJ IRENET95 Irish Transverse Mercator

nima CONSULTANTS

Dublin Array — Generation for generations

Kish Offshore Wind Limited - Bray Offshore Wind Limited

Table 6 Range of estimated values of the whelk fishery overlapping the array area, based on landings by Irish vessels informed by specified data sources.

Data source	Overall annual value (for specified area/region)	Assumptions and justification	Estimated annual value of whelk landed from array area
SFPA landings by ICES rectangle (2015 to 2019)	An annual average of 316 tonnes landed from 35E4; with a first sales value of approximately € 631,000 (based on € 2,000 per tonne)	The array area overlaps with 3.2% of the whelk grounds mapped in Figure 9 [array area = 163.5 km^2; whelk ground = 5,180 km^2; %overlap = 163.5/5,180=3.2%]. The estimated value is based on 3.2% of €8,868,000; and on 5% of €8,868,000. 5% has been included to provide a precautionary range of value upwards from 3.2%.	€283,776 to €443,400
STECF data on Irish vessel landings of whelk from Irish Sea (7a) (2022)	An annual landing of 5,610 tonnes from 7a in 2022; with a first sales value of approximately €11,220,000 (based on €2/kg)	The estimated value is based on 3.2% of €11,220,000; and to provide a precautionary range, on 5% of €11,220,000.	€359,040 to €561,000
SFPA data on Irish vessel landings of whelk from Irish Sea (7a) (2017 to 2022)	An annual average of 4,296 tonnes landed from 7a; with a first sales value of approximately €8,592,000 (based on €2/kg)	The estimated value is based on 3.2% of €8,592,000; and to provide a precautionary range, on 5% of €8,592,000.	€274,944 to €429,600
Port based landings from SFPA combined with highest estimate which was from STECF data from the year 2022	An annual landing of 5,610 tonnes from 7a in 2022; with a first sales value of approximately €11,220,000 (based on €2/kg)	Port based landings data from SFPA for 2017 to 2022 show that 72% of 7a landings are from grounds North of Wicklow In 2022, 5,610 tonnes of whelk were landings from the Irish Sea (7a); 72% of this is landed from the grounds north of Wicklow, which equates to 4,039 tonnes with a first sales value of €8,078,400 from an area of 2,900 km^2. This estimation of the value is based on STECF data, combined with this industry information. The array area overlaps with 5.64% [163.5/2900] of these whelk grounds north of Wicklow, equating to 5.64% of €8,078,400; and to provide a precautionary range, on 8% of €8,078,400.	€455,622 to €646,272
Average annual whelk value landed from the array area based on all scenarios and ranges presented above:			€432,000

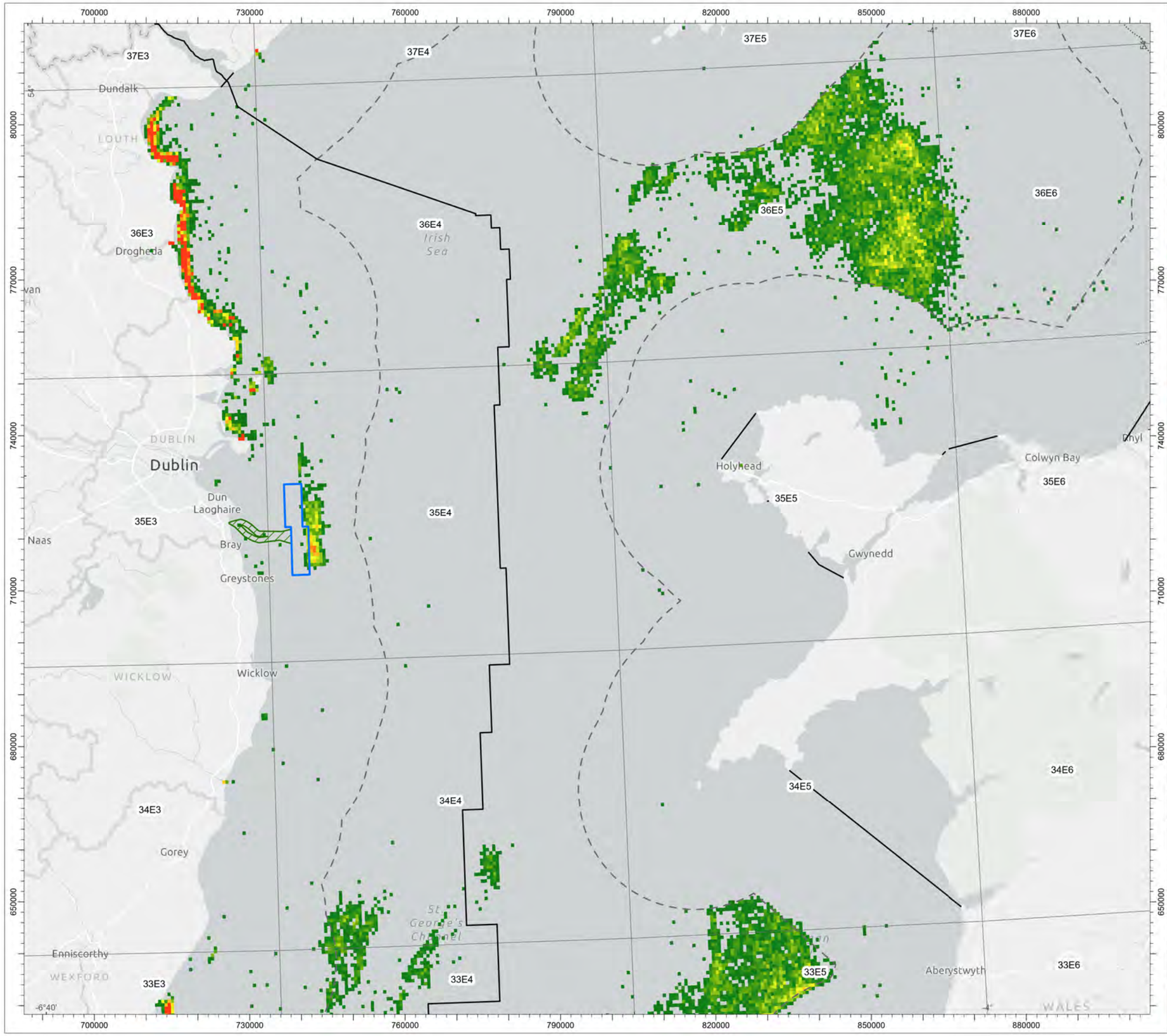
Scallop dredge fishery

9.6.23 A notable scallop dredge ground is recorded along the southeast edge of the array area, including a small portion inside the array area. This is corroborated by a number of sources: Irish vessel VMS data (Figure 10), ICES Working Group mapping of scallop grounds (Figure 17 of the Commercial Fisheries Technical Baseline), ICES VMS data indicating surface swept area ration from 2016-2020 (Figure 19 of the Commercial Fisheries Technical Baseline), and industry consultation.

9.6.24 The scallop ground located along the east edge of the array area is known as the Bray Offshore bed and was surveyed by the Marine Institute in 2023. The presence of scallops was confirmed by the survey and correlates with the areas identified as being targeted by the dredge fishery. The Marine Institute (2023) noted that the survey was limited by static fishing gear overlapping the area resulting in a reduction in the number of tows possible. In addition, the Marine Institute (2023) identified an inshore scallop ground, known as the Bray Inshore bed, located between Bray Head and Dalkey as mapped by the Marine Institute scallop survey (see Figures 4, 5 and 6 of the Commercial Fisheries Technical Baseline).

9.6.25 Industry consultation indicates that there are two scallop fisheries that operate across the study area, as well as wider areas in the Irish Sea:

- 11 scallop dredge vessels target king scallop; and
- Four scallop dredge vessels target queen scallop.



- Array Area
- Export Cable Corridor
- ICES Statistical Rectangles
- EEZ Boundary
- 12 NM Territorial Sea Limit

Irish and EU Dredge Effort 2014-2018

Value

High : 262.76

Low : 0.0033332

DRAWING STATUS

FINAL

DISCLAIMER

MAP NOTES / DATA SOURCES:

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PROJECT TITLE

Dublin Array

DRAWING TITLE

Irish and EU VMS Dredge Effort

DRAWING NUMBER: **10**

PAGE NUMBER: **1 of 1**

VER	DATE	REMARKS	DRAW	CHEK	APRD
01	2024-02-20	DRAFT	FN	SM	SS
02	2024-12-16	FINAL	FN	SM	SS

0 5.5 11 16.5 22 Kilometers

0 4 8 12 16 Miles

SCALE 1:750,000 PLOT SIZE A3

DATUM IRENET95 VERTICAL REF LOWLAT/MLLW

PRJ IRENET95 Irish Transverse Mercator

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9.6.26 The king scallop fishery is primarily operated by vessels from Kilmore Quay in Wexford, targeting areas mainly to the east of the Kish Bank, which is outside and to the east of the array area (as corroborated by VMS data Figure 10) and within the offshore temporary occupation area. The fishing pattern is periodic depending on the abundance of scallops at a given time. There may be years when only a few days are spent in the area, and others when the area is targeted for two to three months.

9.6.27 The statistics indicate that on average 350 tonnes of king scallop, worth € 333,000 in first sales value is landed by Irish vessels from 35E3 and 35E4 (based on five-year data 2015-2019; data source SFPA, 2020).

9.6.28 The queen scallop fleet are mainly fished by Scottish registered vessels, targeting areas east of the Bray Bank. Industry consultation indicates increased landings in recent years, which is supported by landing statistics. UK vessel landings of queen scallop from the study area peaked in 2019 with 1,000 tonnes relating to a first sales value of just under £800,000. Statistics indicate that these 1,000 tonnes of queen scallop landed in 2019 were taken from ICES rectangle 35E4 by UK Scottish registered vessels, over 10 m in length, using dredge (see Figure 57 of the Commercial Fisheries Technical Baseline).

Demersal trawl fishery

9.6.29 Nephrops *Nephrops norvegicus* (also known as Dublin Bay prawn, prawn, langoustine or Norway lobster, hereon referred to as nephrops) is the main species landed within the Irish Sea mixed fisheries targeted using demersal otter trawls. Other species in the Nephrops fishery constitute a low proportion of the overall landings and include cod *Gadus morhua*, haddock *Melanogrammus aeglefinus*, and anglerfish *Lophius* spp. A highly significant nephrops fishery is located ~25 km north and north-west of the array area, within ICES rectangle 36E4.

9.6.30 Some demersal trawl activity is recorded within the study area, although this predominately takes place outside 12 NM and along the Irish EEZ, located east and outside the array area.

9.6.31 Within the study area (35E3 and 35E4) statistics indicate an average value of € 510,000 of nephrops, cod, haddock and anglerfish landed annually (based on five-year data 2015-2019; data source SFPA, 2020).

9.6.32 A beam trawl directed fishery targets flatfish (sole *Solea solea*, plaice *Pleuronectes platessa*, brill *Scophthalmus rhombus* and turbot *Psetta maxima*) and ray species (thornback ray *Raja clavata* and blonde ray *R. brachyura*). Activity is recorded within the study area, although outside the 12 NM, east and outside of the array area.

9.6.33 One specialised vessel based out of Howth is understood from informal consultation with the FLO to have historically targeted rays across areas outside and offshore from the Kish and Bray banks.

9.6.34 Landing statistics indicate plaice, sole, turbot and brill are caught by Irish vessels in the study area with an average annual first sales value of € 860,000 and weight of 300 tonnes (based on five-year data 2015-2019; data source SFPA, 2020). Notable landings of blonde ray (860 tonnes; € 330,000 value) are also recorded. As described, this is expected to be taken outside the 12 NM boundary in a beam trawl targeted fishery.

Mussel seed fishery

9.6.35 The mussel fishery targets seed, which are re-laid for on growing of bottom cultured mussel in aquaculture licence areas. The mussel beds targeted by Irish vessels are considered ephemeral, and therefore harvest rates can be up to 100% of a mussel bed, as seed is not required to be maintained for reproductive capacity (Marine Institute, 2017).

9.6.36 Mussel seed may be found in small patches at the edge of sand banks and on coarse sediments and rock which are scoured by strong currents. VMS data for mussel seed dredge activity shows no activity across Dublin Array from 2015 to 2017 (Marine Institute, 2018).

Razor shell fishery

9.6.37 Activity is well understood as razor clam vessels are required to use GPS trackers to demonstrate that their catch is from classified shellfish waters for food hygiene purposes. No fishing activity for razor clams occurs within the Dublin Array area. This is supported with landings statistics, which indicate considerable value of razor shell and landed by Irish vessels from the Irish Sea, but none taken from the study area (35E3 and 35E4) (data source: SFPA, 2020).

Pelagic trawl fishery

9.6.38 Pelagic fisheries typically operate across wide geographic area to catch shoaling fish as they migrate to spawning grounds. The catches of pelagic species varies both spatially and temporally. Typically, in the wider Celtic Seas ecoregion, pelagic fisheries are targeted predominately along the shelf edge, to the West of Ireland. Some pelagic fisheries do occur within the Irish Sea (Division 7a, see Figure 2 in the Commercial Fisheries Technical Baseline), including herring *Clupea harengus* and sprat *Sprattus sprattus*. Landing statistics for the study area (35E3 and 35E4) indicate landings of sprat in 2015, but no other landings in the years 2016-2019.

9.6.39 Consultation with fishers indicates that an inshore sprat fishery is occasionally targeted close inshore from within bays from Dún Laoghaire to Rosslare. The fishery is highly seasonal, targeted in the winter months from December to February and undertaken by one to three vessels using single pelagic trawl. Minimal activity by pelagic vessels is expected across the array area.

The Offshore export cable corridor

9.6.40 The Offshore ECC overlaps with ICES rectangles 35E3 and 35E4.

Potting fishery

9.6.41 Activity for the potting fleet targeting whelk is as described above. Industry consultation indicates that inshore grounds are also targeted by potters using creels for crab and lobster. Due to data limitations this is not corroborated by landing statistics or fisheries mapping for vessels <15 m in length for the region. It is understood based on consultation with fishers that significant crab and lobster fisheries are targeted across the inshore region, and that fishers actively V-notch and return berried lobster. Sales are to market and also directly to shops and restaurants.

Scallop dredge fishery

9.6.42 Activity of the scallop dredge fishery is focused within other areas of the Irish Sea (Figure 16 of the Commercial Fisheries Technical Baseline), with some activity along and within the array area boundary. There are scallop tows in the inshore area between Bray and Shanganagh which are targeted when scallop numbers are high enough to produce good catch rates. Scallop dredging in the area may be restricted by dense pot fishing in the area. Overall, intermittent activity by scallop dredge vessels is expected across the Offshore ECC.

Demersal trawl fishery

9.6.43 As described above, small levels of activity by demersal otter trawling vessels are recorded across the Offshore ECC; no activity is recorded for the beam trawl fleet within the Offshore ECC area.

Mussel seed fishery

9.6.44 As described above and in line with current and historic fishing patterns, minimal activity by the mussel seed fishery is expected across the Offshore ECC.

Razor shell fishery

9.6.45 As described above, no activity by the razor shell fishery currently occurs across the Offshore ECC.

Pelagic trawl fishery

9.6.46 As described above, low levels of activity by pelagic vessels currently occurs across the Offshore ECC.

9.7 Future receiving environment

9.7.1 Potting for whelks is currently the principal fishing activity undertaken in the commercial fisheries local study area by the local fleet and activity is for the most part concentrated within the inshore area out to 12 NM boundary. Landings of this species are not restricted through annual quota, however, management measures are currently implemented through the "Whelk (Conservation of Stocks) Regulations, 2006".

9.7.2 Detailed information on the status of the local common whelk *Buccinum undatum* stock is not currently available. This species has generally been considered to be depleted or locally depleted in the Irish Sea for some time due to high fishing mortality (Tully, 2017).

9.7.3 The 2022 Shellfish Stocks and Fisheries Review (Marine Institute & BIM, 2023) provided an assessment of whelks. The size at maturity for whelk is well above the minimum landing size (MLS) and it is, therefore, feasible that local depletions of stock may occur (i.e., an individual whelk is legally caught before it has reached maturity and therefore has not contributed to stock biomass production). In future it is considered not feasible to solely manage the whelk fishery using MLS; however, increasing the MLS to the average size at maturity would severely limit landings. Overall, it is considered that area-based management within the Irish Sea may be necessary for the whelk fishery (Marine Institute & BIM, 2023).

9.7.4 Where local inshore whelk stocks decline or are depleted in the future, there may be potential for fishing activity to move further offshore. From information gathered during consultation with local fisheries stakeholders, it is understood that some local fishermen are already investing in larger vessels to allow them to target offshore grounds. Although the majority of vessels that have entered the fleet in the past 4-5 years are still in the 8 to 12m range.

9.7.5 With regards to the mussel seed fishery, potential fishing grounds would be expected to remain relatively consistent with the locations of mapped seed mussel dredge areas (Figure 16 of the Commercial Fisheries Technical Baseline). Known seed mussel beds do not overlap with Dublin Array and presence would not be expected in the future.

9.7.6 The baseline assessment has demonstrated that commercial fisheries landings and activity varies from year-to-year, and that changing trends are normal and expected in future fisheries receiving environment. Patterns in commercial fisheries change and fluctuate based on a range of natural and management-controlled factors. This includes the following:

- Brexit: there have been two schemes to support the Irish fishing industry due to the reduction in the Total Allowable catches (TACs) and quotas as a result of Brexit:
  - Tie up scheme: for one month in 2021 and for two months in 2022;
  - Decommissioning scheme: in 2023 primarily affecting the offshore fleet;
- Market demand: commercial fishing fleets respond to market demand, which is impacted by a range of factors, including the COVID pandemic affecting landings in 2020 and 2021;
- 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.) or 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;
- Climate change: increased sea temperatures leading to changes in distribution and abundance of certain species and thereby impacting catch rates; and/or higher rate of occurrence of extreme weather events disturbing or preventing normal fishing operations;
- 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.

9.7.7 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. The key species targeted in the commercial fisheries local study area are non-quota shellfish species which therefore do not have negotiated TACs. The effect of the withdrawal of the UK from the EU and subsequent reallocation of TACs is not of relevance to these fisheries and therefore has minimal effect on these fisheries. It is therefore considered, with sufficient certainty, that the current receiving environment is reflective of the future scenarios over the lifetime of Dublin Array.

9.7.8 Overall, given the time periods assessed, the anticipated evolution of the receiving environment without Dublin Array is expected to be reflected within the current receiving environment assessment undertaken.

9.8 Do nothing environment

9.8.1 In the event that the development of the Dublin Array did not proceed, no alterations to the receiving environment are anticipated in addition to those presented in the future receiving environment section above.

9.9 Uncertainties and technical difficulties encountered

9.9.1 Limitations associated with the data used to inform the description of the existing environment are described in Section 5 of the Commercial Fisheries Technical Baseline. Limitations include lack of AIS and VMS data for inshore vessels (i.e., no AIS for vessels under 15 m and no VMS for vessels under 12 m in length); together with limited landings data for vessels under 10 m in length and suppression of landing statistics related to confidentiality (i.e., to ensure individual vessels cannot be identified).

9.9.2 Lack of recent landings statistics for EU (non-Irish) 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 (35E3 and 35E4). Data at a scale of ICES division (i.e. the whole of the Irish Sea) is less useful to understand fishing activity specific to the area overlapping the Dublin Array.

9.9.3 Extensive attempts were made to source data directly from processors and commercial fishing businesses directly, with the intention of assessing amalgamated sales notes for a representative sample of the industry. Such data was not possible to obtain for EIA purposes.

9.9.4 Despite the data limitations and uncertainties, a good range of fisheries data has been available from a range of sources including:

- Fisheries dependant data from SFPA, EU DCF, Eurostat and MMO;
- Scientific stock assessments from Marine Institute and BIM and ICES;
- Officially amalgamated datasets covering logbook declarations, sales notes for vessels under 10 m, gatherer dockets and co-op data as assessed by Marine Institute and BIM; and
- Fisheries independent survey data undertaken by Aquafact.

9.9.5 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 Sections 9.13 to 9.16.

9.10 Scope of the assessment

9.10.1 The impacts that will be assessed for commercial fisheries receptors are detailed in Table 7.

Table 7 Potential impacts considered within the commercial fisheries assessment

Potential impact / change	Impact
Construction	
Array area construction activities and physical presence of constructed wind farm infrastructure leading to reduction in access to, or exclusion from established fishing grounds within advisory safe passing distances.	Impact 1
Offshore export cable construction activities and physical presence of constructed infrastructure leading to reduction in access to, or exclusion from established fishing grounds	Impact 2
Displacement from Dublin Array leading to gear conflict and increased fishing pressure on adjacent grounds	Impact 3
Dublin Array construction activities leading to disturbance of commercially important fish and shellfish resources leading to displacement or disruption of fishing activity	Impact 4
Increased vessel traffic associated with Dublin Array within fishing grounds leading to interference with fishing activity	Impact 5
Operation and Maintenance (O&M)	

Potential impact / change	Impact
Physical presence of array area infrastructure leading to reduction in access to, or exclusion from established fishing grounds	Impact 6
Physical presence of Offshore ECC leading to reduction in access to, or exclusion from established fishing grounds	Impact 7
Displacement from Dublin Array leading to gear conflict and increased fishing pressure on adjacent grounds	Impact 8
Dublin Array operation and maintenance activities leading to disturbance of commercially important fish and shellfish resources leading to displacement or disruption of fishing activity	Impact 9
Increased vessel traffic within fishing grounds as a result of changes to shipping routes and maintenance vessel traffic from Dublin Array leading to interference with fishing activity	Impact 10
Physical presence of Dublin Array infrastructure leading to gear snagging	Impact 11
Decommissioning	
Array area decommissioning activities leading to reduction in access to, or exclusion from, potential and/or established fishing grounds	Impact 12
Offshore ECC decommissioning activities leading to reduction in access to, or exclusion from established fishing grounds	Impact 13
Displacement from the array area leading to gear conflict and increased fishing pressure on adjacent grounds	Impact 14
Displacement from the Offshore ECC leading to gear conflict and increased fishing pressure on adjacent grounds	Impact 15
Decommissioning activities leading to disturbance of commercially important fish and shellfish resources leading to displacement or disruption of fishing activity	Impact 16
Increased vessel traffic within fishing grounds as a result of changes to shipping routes and transiting decommissioning vessel traffic from Dublin Array leading to interference with fishing activity	Impact 17
Physical presence of any infrastructure left in situ leading to gear snagging	Impact 18
Cumulative	
Reduction in access to, or exclusion from established fishing grounds	Effect 19
Displacement leading to gear conflict and increased fishing pressure on established fishing grounds	Effect 20

9.11 Key parameters for assessment

9.11.1 As set out in the Application for Opinion under Section 287B of the Planning and Development Act 2000, flexibility is being sought where details or groups of details may not be confirmed at the time of the application. In summary, and as subsequently set out in the ABP Opinion on Flexibility (detailed within the EIA Methodology Chapter) the flexibility being sought relates to those details or groups of details associated with the following components (in summary - see further detail in see Volume 2, Chapter 6: Project Description [hereafter referred to as the Project Description Chapter]):

- WTG (model – dimensions and number);
- OSP (dimensions);

- Array layout;
- Foundation type (WTG and OSP; types and dimensions and scour protection techniques); and
- Offshore cables (IAC and ECC; length and layout).

9.11.2 To ensure a robust, coherent, and transparent assessment of the proposed Dublin Array project for which development consent is being sought under section 291 of the Planning Act, the Applicant has identified and defined a Maximum Design Option (MDO) and Alternative Design Option(s) (ADO) for each environmental topic/receptor. The MDO and ADO have been assessed in the EIAR to determine the full range and magnitude of effects, providing certainty that any option within the specified parameters will not give rise to environmental effects more significant than that which could occur from those associated with the MDO. The extent of significant effects is therefore defined and certain, notwithstanding that not all details of the proposed development are confirmed in the application.

9.11.3 The range of parameters relating to the infrastructure and technology design allow for a range of options in terms of construction methods and practices, which are fully assessed in the EIAR. These options are described in the project description and are detailed in the MDO and ADO tables within each offshore chapter of the EIAR. This ensures that all aspects of the proposed Dublin Array project are appropriately identified, described and comprehensively environmentally assessed.

9.11.4 In addition to the details or groups of details associated with the components listed above (where flexibility is being sought), the confirmed design details and the range of normal construction practises are also assessed within the EIAR (see the Project Description Chapter). Whilst flexibility is not being sought for these elements (for which plans and particulars are not required under the Planning Regulations), the relevant parameters are also incorporated into the MDO and alternative option(s) table herein (Table 8) to ensure that all elements of the project details are fully considered and assessed.

9.11.5 With respect to project design features where flexibility is not being sought, such as trenchless cable installation methodology at the landfall, the MDO and alternative design option(s) are the same (as there is no alternative). With respect to the range of normal construction practises that are intrinsic to installation of the development, such as the nature and extent of protection for offshore cables and the design of cable crossings, but which cannot be finally determined until after consent has been secured and detailed design is completed, the parameters relevant to the receptor being assessed are quantified, assigned and assessed as a maximum and alternative, as informed by the potential for impact upon that receptor. In the event of a favourable decision on the application they will be agreed prior to the commencement of the relevant part of the development by way of compliance with a standard 'matters of detail' planning condition (see the Policy Chapter). Throughout, an explanation and justification is provided for the MDO and alternative(s) within the relevant tables, as it relates the details or groups of details where statutory design flexibility is being sought, and wider construction practises where flexibility is provided by way of planning compliance condition.

Table 8 Maximum and Alternative Design Options assessed

Maximum design option	Alternative design options	Justification
Construction		
Impact 1: Array area construction activities and physical presence of constructed wind farm infrastructure leading to reduction in access to, or exclusion from established fishing grounds		
Construction period: Maximum of **30 months**.	**Construction period:** Minimum of **18 months** or a mid-case of **24 months**.	The MDO represents the maximum duration and the maximum 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 array area due to the presence of a buoyed construction area plus the temporary footprint of preparatory works within the temporary occupation area. It is important to note that the temporal aspect of temporary works will not apply in full throughout the 30 month offshore construction phase, as activities will be completed sequentially. The minimum burial depth represents the MDO due to risk of interaction with penetrative fishing gear. The alternative design options (or any other option within the range of parameters set out in the project description) will not give rise to an effect which is more significant than the maximum design option.
Total project area: Full build out of the array area (total array project area: **59 km2**). Temporary occupation area: 88 km2	**Total project area:** As per MDO.	
Advisory safe passing distances: Advisory safe passing distances of 500 m around all active construction works = 0.79 km2 per structure under construction at any one time. Advisory safe passing distances of 50 m around incomplete structures = 7,854 m2 per partially constructed structure at any one time.	**Advisory safe passing distances:** As per MDO.	
Buoyed construction area: Buoyed construction area around array area.	**Buoyed construction area:** As per MDO.	
Structures: Option A: 50 Wind Turbine Generators (WTG); Foundation: multileg foundations; Minimum spacing between turbines of 944 m; Offshore substation platform (OSP): one OSP on multileg foundations; Permanent vessel moorings: two with drag embedment anchors and maximum impact footprint of all buoys on sea floor during construction of 0.006 km2.	**Structures:** Option B: 45 WTGs or Option C: 39 WTGs; Foundation: monopile; Minimum spacing between turbines of 1,000 m (Option B: 45 WTGs) or 1,112 m (Option C: 39 WTGs); Offshore substation platform (OSP): As per MDO	
Inter-array cables: Maximum total length of 120 km of buried inter-array cables, with protection along up to 20% of route length (including rock or gravel, concrete mattress, Flow energy dissipation devices, dredged sandy material, protective aprons, coverings, cladding or pipe, bagged solutions), and two cable crossings (including rock dumping, concrete mattress, steel bridging, concrete bridging)	**Inter-array cables:** As per MDO.	
IAC Crossing: Allowance for up to two potential crossings of Export cable and IACs within array; Assumed to be constructed of both concrete mattresses (six per crossing) and rock berm.	IAC crossing: As for MDO	
Minimum burial depth in standard conditions: 0.6m or cable protection required	Maximum burial depth in standard conditions: 3 m.	
Impact 2: Offshore export cable construction activities and physical presence of constructed infrastructure leading to reduction in access to, or exclusion from established fishing grounds		
Construction period: 154 days of installation activities within a maximum construction period of 7 months across the ECC.	**Construction period:** As per MDO.	The MDO represents the maximum duration and the maximum extent of fishing exclusion throughout the construction phase and hence the greatest potential to restrict access to fishing grounds. The minimum burial depth represents the MDO due to risk of interaction with penetrative fishing gear.
Total project area: Export cable corridor area: 23.91 km2; Temporary occupation area: 88 km2.	**Total project area:** As per MDO	

Maximum design option	Alternative design options	Justification
Export cable: - Two offshore export cable routes; - Maximum length of one export cable = 18.35 km - Max spacing between parallel cables if two cables (in single corridor): 1,000 m; **Cable protection:** - Export cable: up to 70% requiring protection - Maximum footprint of cable protection = 12 km (up to 6km per cable) - Total footprint of all export cable crossings includes footprint of the berm and mattresses x six crossings	**Export cable:** As per MDO. **Cable protection:** The alternative option involves no cable protection required; Cable protection measures may not be required at any location, if the desired depth of cover is achieved at all points. This approach would represent the design option with the minimum scale of effect. Alternative options include the potential for varying percentages of the cable routes to require cable protection, ranging from 0% up to that assessed as the maximum design option"	The alternative design options (or any other option within the range of parameters set out in the project description) will not give rise to an effect which is more significant than the maximum design option.
Minimum burial depth in standard conditions: 0.6m or cable protection required	Minimum burial depth in standard conditions: as per MDO.	
Landfall methodology: Trenchless techniques will be used beneath the beach, cliffs and intertidal area to be undertaken at Shanganagh. - Drilling punch-out location: Subtidal; - Up to one per cable; - drilling punch out: Up to one per cable; - Maximum punch out dimensions: 25 m (long) x 5 m (wide)	**Landfall methodology:** No alternative options have been considered for this operation, as trenchless techniques are considered the most appropriate option.	
Use of drilling fluid (landfall): Trenchless installation The drilling fluid is anticipated to be a low concentration bentonite/water mixture. Drill exit head to will stop short of punch out, flush bentonite, and complete the final 10 m in order to mitigate bentonite release on punch out. For the purposes of the assessment this is assumed to be an instantaneous release as this is the most conservative assumption for the purposes of the study/assessment model.	No alternative options have been considered for this operation, as the methodology described as the maximum design option is considered the most appropriate option.	
Impact 3: Displacement from array area and Offshore ECC leading to gear conflict and increased fishing pressure on adjacent grounds		
As above. See Impact 1: Array area construction activities and physical presence of constructed wind farm infrastructure leading to reduction in access to, or exclusion from established fishing grounds and Impact 2: Offshore export cable construction activities and physical presence of constructed infrastructure leading to reduction in access to, or exclusion from established fishing grounds		The MDO represents the maximum duration and the maximum extent of fishing exclusion throughout the construction phase and hence the greatest potential to displace fishing activity.
Impact 4: Array area and Offshore ECC construction activities leading to disturbance of commercially important fish and shellfish resources leading to displacement or disruption of fishing activity		
See MDO presented in the Fish and Shellfish Ecology Chapter.	See ADO presented in the Fish and Shellfish Ecology Chapter.	The scenarios presented in the Fish and Shellfish Ecology Chapter 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 option for the Fish and Shellfish Ecology chapter, rather than any one impact in particular.

Maximum design option	Alternative design options	Justification
Impact 5: Increased vessel traffic associated with Dublin Array within fishing grounds leading to interference with fishing activity		
Project vessels Construction vessels will comprise of installation vessels and smaller support vessels. Installation vessels include those for foundation, WTG and OSP installation and cable lay vessels. The foundation, WTG and OSP installation vessels will include cranes, which when fully extended will be 220 m in height. Up to three large installation vessels and associated support craft operating simultaneously with a total of **66** vessels on site at any time; and Up to **813** round trips to port from construction vessels and an additional **1,825** round trips from small vessels such as CTVs during construction period.	**Project vessels** Construction vessels will comprise of installation vessels and smaller support vessels. Installation vessels include those for foundation, WTG and OSP installation and cable lay vessels. The foundation, WTG and OSP installation vessels will include cranes, which when fully extended will be 220 m in height. Up to three large installation vessels and associated support craft operating simultaneously with a total of **51** vessels on site at any time; and Up to **774** round trips to port from construction vessels and an additional **538** round trips from small vessels such as CTVs during construction period.	The maximum number of turbines and associated infrastructure will lead to the highest level of construction activities and therefore highest level of construction vessel round trips. The maximum number of vessels transits and the maximum duration of the construction would result in the greatest potential for interference. The alternative design options (or any other option within the range of parameters set out in the project description) will not give rise to an effect which is more significant than the maximum design option.
Operation and Maintenance		
Impact 6: Physical presence of array area infrastructure leading to reduction in access to, or exclusion from established fishing grounds		
Operational period: 35 years. **Total project area:** Full build out of the array area: 59 km2. **Advisory safe passing distances:** Advisory safe passing distances of 500 m around all active maintenance works = 0.79 km2 per vessel or structure. **Structures:** Option A: 50 WTGs; Foundation: Multileg foundations; Minimum spacing between turbines of 944 m; Offshore substation platform (OSP): one OSP on multileg foundations; Permanent vessel moorings: two with drag embedment anchor and maximum impact footprint of all buoys chains on sea floor of 0.094 km2. **Inter-array cables:** Maximum total length of 120 km of buried inter-array cables, with protection along up to 20% of route length (including rock or gravel, concrete mattress, Flow energy dissipation devices, dredged sandy material, protective aprons, coverings, cladding or pipe, bagged solutions), and two cable crossings (including rock dumping, concrete mattress, steel bridging, concrete bridging) Minimum burial depth in standard conditions: 0.6m or cable protection required	**Operational period:** 35 years **Total project area:** As per MDO. **Advisory safe passing distances:** No advisory safe passing distances used. **Structures:** Option B: 45 WTGs or Option C: 39 WTGs; Foundation: monopile; Minimum spacing between turbines of 1,000 m (Option B: 45 WTGs) or 1,112 m (Option C: 39 WTGs); Offshore substation platform (OSP): As per MDO **Inter-array cables:** As per MDO. Maximum burial depth in standard conditions: 3 m.	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 advisory safe passing distances. The smaller the spacing between turbines the greater the potential for vessels to have restricted access to the site. The minimum burial depth represents the MDO due to risk of interaction with penetrative fishing gear. The assessment assumes that fishing will be restricted within advisory safe passing distances 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 Dublin Array. Inclement weather will be a significant contributor to this risk perception. The alternative design options (or any other option within the range of parameters set out in the project description) will not give rise to an effect which is more significant than the maximum design option.
Impact 7: Physical presence of Offshore ECC leading to reduction in access to, or exclusion from established fishing grounds		
Operational period: 35 years. **Advisory safe passing distances:** Advisory safe passing distances of 500 m around all active maintenance works = 0.79 km2 per vessel or structure.	**Operational period:** 35 years. **Advisory safe passing distances:** No advisory safe passing distances used.	The MDO represents the maximum duration and the maximum extent of fishing exclusion throughout the operational and maintenance phase and hence the greatest potential to restrict access to fishing grounds. It is assumed that fishing will resume across the Offshore ECC are during operation, with the exception of across areas of remedial protection.

Maximum design option	Alternative design options	Justification
Export cable: Two offshore export cable routes; Two export cable circuits, with maximum length of 18.35 km per cable circuit Max spacing between parallel cables if two cables (in single corridor): 1,000 m; Minimum burial depth in standard conditions: 0.6m or cable protection required	**Export cable:** As per MDO. Maximum burial depth in standard conditions: 3 m.	The minimum burial depth represents the MDO due to risk of interaction with penetrative fishing gear. The alternative design options (or any other option within the range of parameters set out in the project description) will not give rise to an effect which is more significant than the maximum design option.
Export cable protection: - Maximum footprint of cable protection = 12 km (up to 6km per cable) - Total footprint of all export cable crossings includes footprint of the berm and mattresses x six crossings	**Export cable protection:** The alternative option involve no cable protection required; Cable protection measures may not be required at any location, if the desired depth of cover is achieved at all points. This approach would represent the design option with the minimum scale of effect. Alternative options include the potential for varying percentages of the cable routes to require cable protection, ranging from 0% up to that assessed as the maximum design option	
Cable crossings - Assumes a maximum of two cable crossings of Dublin Array cables; - Assumed to be constructed of both concrete mattresses (six per crossing) and rock berm	**Cable crossings:** Alternative options for cable crossings include the use of concrete mattresses placed in isolation, rather than in addition to rock berms as in the maximum design option.	
Impact 8: Displacement from Dublin Array leading to gear conflict and increased fishing pressure on adjacent grounds		
As above: See Impact 6: Physical presence of array area infrastructure leading to reduction in access to, or exclusion from established fishing grounds and Impact 7: Physical presence of Offshore ECC leading to reduction in access to, or exclusion from established fishing grounds		
Impact 9: Dublin Array operation and maintenance activities leading to displacement or disruption of commercially important fish and shellfish resources		
See MDO presented in the Fish and Shellfish Ecology Chapter.	See ADO presented in the Fish and Shellfish Ecology Chapter.	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. The alternative design options (or any other option within the range of parameters set out in the project description) will not give rise to an effect which is more significant than the maximum design option.
Impact 10: Increased vessel traffic within fishing grounds as a result of changes to shipping routes and maintenance vessel traffic from Dublin Array leading to interference with fishing activity		
Project vessels Three daily CTV trips with the addition of up to **100** vessels trips to support scheduled routine and non-routine maintenance per year.	**Project vessels** Two daily CTV trips with the addition of up to **75** vessels trips to support scheduled routine and non-routine maintenance.	The maximum number of turbines and associated infrastructure will lead to the highest level of operation and maintenance activities and therefore highest level of operation and maintenance vessel round trips. The alternative design options (or any other option within the range of parameters set out in the project description) will not give rise to an effect which is more significant than the maximum design option.
Impact 11: Physical presence of Dublin Array infrastructure leading to gear snagging		
As above: See Impact 6: Physical presence of array area infrastructure leading to reduction in access to, or exclusion from established fishing grounds and Impact 7: Physical presence of Offshore ECC leading to reduction in access to, or exclusion from established fishing grounds		

Maximum design option	Alternative design options	Justification
Decommissioning		
Impact 12: Array area decommissioning activities leading to reduction in access to, or exclusion from, potential and/or established fishing grounds		
Removal of structures is expected to be undertaken as an approximate reverse of the installation process; - It is anticipated that piled foundations will be cut at a level just below the seabed; - Buried cables to be cut and left in situ (but to be determined in consultation with key stakeholders as part of the decommissioning plan and following best practice at the time of decommissioning); - Scour and cable protection left in situ; and - Decommissioning activities lasting approximately three years for both onshore and offshore works. **Removal of foundations:** - Option A: 50 WTGs; and - One OSP. - Landfall infrastructure will be left in situ where considered appropriate. Any requirements for decommissioning at the landfall will be agreed with statutory consultees; and - It is likely judged that cable removal will bring about further environmental impacts. At present it is therefore proposed that the cables will be left in situ, but this will be reviewed over the design life of the project.	Decommissioning activities are expected to be the same for all design options. Alternative design options are represented by varying numbers of total structures within the array area (represented by different WTG options), as shown below. **Removal of foundations:** - Option C: 39 WTGs and Option B: 45 WTGs; and - One OSP. As for the MDO Landfall infrastructure will be left in situ where considered appropriate. Any requirements for decommissioning at the landfall will be agreed with statutory consultees; and - It is likely judged that cable removal will bring about further environmental impacts. At present it is therefore proposed that the cables will be left in situ, but this will be reviewed over the design life of the project.	The MDO is the option with the greatest number of WTGs (Option A: 50 WTGs). All alternatives have lower potential for damage to assets and infrastructure during decommissioning.
Impact 13: Offshore ECC decommissioning activities leading to reduction in access to, or exclusion from established fishing grounds		
As above: See Impact 12: Array area decommissioning activities leading to reduction in access to, or exclusion from, potential and/or established fishing grounds		
Impact 14: Displacement from the array area and Offshore ECC leading to gear conflict and increased fishing pressure on adjacent grounds		
As above: See Impact 12: Array area decommissioning activities leading to reduction in access to, or exclusion from, potential and/or established fishing grounds		
Impact 15: Decommissioning activities leading to displacement or disruption of commercially important fish and shellfish resources		
As above: See Impact 12: Array area decommissioning activities leading to reduction in access to, or exclusion from, potential and/or established fishing grounds		
Impact 16: Increased vessel traffic within fishing grounds as a result of changes to shipping routes and transiting decommissioning vessel traffic from Dublin Array leading to interference with fishing activity		
As above: See Impact 12: Array area decommissioning activities leading to reduction in access to, or exclusion from, potential and/or established fishing grounds		
Impact 17: Physical presence of any infrastructure left in situ leading to gear snagging		
As above: See Impact 12: Array area decommissioning activities leading to reduction in access to, or exclusion from, potential and/or established fishing grounds		

9.12 Project Design Features and Avoidance and Preventative Measures

9.12.0 As outlined within the EIA Methodology Chapter and in accordance with the EPA Guidelines (2022), this EIAR describes the following:

- Project Design Features: These are features of the Dublin Array project that were selected as part of the iterative design process, which are demonstrated to avoid and prevent significant adverse effects on the environment in relation to commercial fisheries. These are presented within Table 9.
- Other Avoidance and Preventative Measures: These are measures that were identified throughout the early development phase of the Dublin Array project, also to avoid and prevent likely significant effects, which go beyond design features. These measures were incorporated in as constituent elements of the project, they are referenced in the Project Description Chapter of this EIAR and they form part of the project for which development consent is being sought. These measures are distinct from design features and are found within our suite of management plans. These are also presented within Table 9.
- Additional Mitigation: These are measures that were introduced to the Dublin Array project after a likely significant effect was identified during the EIA assessment process. These measures either mitigate against the identified significant adverse effect or reduce the significance of the residual effect on the environment. The assessment of impacts is presented in Sections 1.14 and 1.17 of this EIAR chapter.

9.12.1 It is noted that current Irish legislation does not allow for statutory safety zones, and as such the use of advisory safe passing distances as opposed to "prohibiting" vessel access is proposed as a preventative measure.

9.12.2 Where additional mitigation is identified as being required to reduce the significance of the residual effect in EIA terms, this is presented in Sections 9.13 and 9.16.

9.12.3 All measures are secured within Volume 8, Chapter 2, Schedule of Commitments.

Table 9 Project Design and avoidance and preventative measures relating to commercial fisheries

Project Design Features / other avoidance and preventative measures	Where secured
Applicant will implement the following, in line with the Sea Pollution Act 1991 and MARPOL convention and other similar binding rules and obligations imposed on ship owners and operators by inter alia the International Maritime Organisation as relevant: ▪ Marine Pollution Contingency Plan to cover accidental spills, potential contaminant release and include key emergency contact details (e.g., the Irish Coast Guard (IRCG) and will comply with the National Maritime Oil/ HNS Spill Contingency Plan (IRCG, 2020) .	The PEMP includes measures outlined within the Marine Pollution Contingency Plan compliant with relevant legal obligations and frameworks

Project Design Features / other avoidance and preventative measures	Where secured
▪ Measures include Storage of all chemicals in secure designated areas with impermeable bunding (up to 110% of the volume); and double skinning of pipes and tanks containing hazardous materials to avoid contamination.	
Measures to facilitate co-existence and co-location with the commercial fishing sector through effective consultation and liaison including: ▪ Use of a Fisheries Liaison Officer; ▪ Fisheries support vessels; ▪ Marine coordination team; ▪ Marine notices	Measures captured within a Fisheries Mitigation and Management Strategy (Planning stage) with subsequent updates to reflect project stage.
Marking and lighting offshore infrastructure in accordance with relevant industry guidance and as advised by relevant stakeholders including in accordance with IALA G-1162 (IALA, 2021) and Irish lights requirements . In particular, the use of marine lighting to mark selected peripheral structures. All structures associated with Dublin Array will be adequately marked on nautical and electronic charts	Measures captured within the Lighting and Marking Plan
Navigational safety measures including: ▪ Compliance with COLREGs ▪ Marine coordination; ▪ Temporary lighting and marking; ▪ Operational lighting and marking; ▪ Use of guard vessels; ▪ Advisory safe passing distances; ▪ Charting; ▪ Emergency Response Cooperation Planning.	Measures contained within the Vessel Management Plan designed to prevent any risks of collision or disruption to other craft, all measures will ensure compliance with the Convention on the International Regulations for Preventing Collisions at Sea (COLREGS) (International Maritime Organization (IMO), 1972/77)
Project design in line with MGN 654 Compliance	In the absence of relevant Irish guidance, the Offshore infrastructure will ensure compliance with MGN 654 (MCA, 2021) for the construction, operation and decommissioning phases of the offshore infrastructure. Includes the need to consult with MSO and Irish Lights water depths are reduced by more than 5% as a result of cable protection or other infrastructure.
Installation of cables to an optimum cable burial depth - offshore cables will, where possible, be buried in the seabed to the optimal performance burial depth for the specific ground conditions. Where optimum burial depth cannot be achieved secondary protection measure will be deployed e.g. concrete mattress, rock berm, grout bags or an equivalent in key areas	The Project Description Chapter details the requirement for a Cable Installation Plan (CIP) and Cable Burial Risk Assessment (CBRA) which will be developed upon award of consent and in advance of construction. The CIP and CBRA will provide information on the

Project Design Features / other avoidance and preventative measures	Where secured
	installation plan for subsea cables. The CBRA, will provide a risk assessment and evaluation for cable protection, unburied or shallow buried cables. The CIP will detail pertinent mitigation measures to be used during cable installation and will be applied throughout the construction phase. The CIP and CBRA will be submitted to the consenting authority in advance of construction phase.

9.13 Environmental Assessment: Construction phase

9.13.1 This section assesses the impacts to commercial fishing fleets that may arise as a result of the construction of the offshore infrastructure.

Impact 1: Array area construction activities and physical presence of constructed wind farm infrastructure leading to reduction in access to, or exclusion from established fishing grounds.

9.13.2 During construction of the array area, it is assumed that commercial fishing will not take place within advisory safe passing distances of 500 m diameter around significant infrastructure under construction, and 50 m diameter around partially completed or pre-commissioned structure. In addition, a buoyed construction area will be deployed surrounding the entirety of the array area to alert fishers of the ongoing construction. It is assumed fishers may choose to enter the buoyed construction area to fish in locations that are not under active construction. The total offshore construction duration will be 30 months, with a number/range of construction activities being undertaken simultaneously across the site.

9.13.3 As per Table 8, the MDO for this impact has been identified as the maximum number of structures built out over the entire array area, with a buoyed construction area surrounding the entirety of the array area together with temporary activities within the temporary occupation area, given that this will create the maximum duration and extent of fishing exclusion throughout the construction phase and hence the greatest potential to restrict access to fishing grounds. As per Table 9, avoidance and preventative measures for this impact includes the measures with the PEMP, advisory safe passing distances, guard vessels, and regular fisheries liaison as defined in the FMMS. This impact will lead to a localised loss of access to fishing grounds and the fish and shellfish resources within the array area for a range of fishing opportunities during the period of construction, which will directly affect fleets over a short-term duration (i.e., 30 months).

Magnitude of impact

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

9.13.5 The MDO and ADOs include deployment of a buoyed construction area around the entirety of the array area during the construction phase, and it is therefore assumed that fishing will not resume within the array area during the construction phase. The assessment for all other design options is therefore consistent with the assessment made for the MDO for all fishing fleets.

9.13.6 *Whelk potting fishery*: the Irish potting fleet targets whelk across a defined area from inshore grounds extending out into and beyond the array area (Figure 9). This distinct area of fishing ground specifically targeted for whelk runs along the south-east coast of Ireland and extends in places out to the 12 NM territorial seas limit. Landing statistics, fisheries mapping for vessels under 15 m length, and consultation with a range of stakeholders (SFPA, Marine Institute, BIM and the fishing industry) corroborate that Irish potting vessels actively target whelk in the array area and across grounds represented in Figure 9.

9.13.7 Annual first sales values of whelk from this area vary greatly depending on the data source assessed (see Table 6). Noting that the array area overlaps with approximately 3.2% of the south-east whelk grounds, this equates to a pro-rata value ranging from € 45,000 to € 414,000 per annum from within the array area (based on uniform landings across the entire area). While such a simplistic calculation brings higher level of uncertainty to the resulting figure, it does demonstrate the potential opportunity within the array area. During construction, potting vessels will be required to remove pots from the buoyed construction area 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 it may therefore be unlikely that all pots deployed by a single vessel will be impacted at any one time. That being said, it is feasible that an individual fisher could have all their activity in this area at any given time.

9.13.8 Further to landings statistics, industry consultation has repeatedly raised concern in relation to the construction activities, both through direct EIA consultation and through individual discussions with the project FLO. The east coast whelk grounds across the Kish, Bray and Codling banks, including the array area, are noted as significantly important grounds for the local potting vessels.

9.13.9 The consequence of the impact to the potting fleet targeting whelk is assessed as moderate, based on the potential moderate loss of ability to carry on fishing activities, noting that the vessels within the fleet under assessment have a moderate proportion of effort within the array area. The overall magnitude of impact is assessed as **Medium adverse**.

9.13.10 *Crab and lobster potting fishery*: limited activity is recorded by the Irish potting fleet targeting crab and lobster across the array area, with higher activity in the inshore areas, west of the array area. Available mapping is not representative of the inshore fishing fleet (given that vessel under 12m in length do not have VMS) and SFPA landing statistics are not considered to accurately quantify landings for the under 10m vessels. Vessels targeting whelk (as described above), may also target crab and lobster across the wider study area, including occasional activity within the array area.

9.13.11 The consequence of the impact to the potting fleet targeting crab and lobster is expected to cause minor loss of ability to carry on fishing activities within the array area, based on the limited overlap of current activity within the array area, noting that the vessels within the fleet under assessment predominately target areas elsewhere. The overall magnitude of impact is assessed as **Low adverse**.

9.13.12 *Dredge fishery:* the Irish and UK dredging fleet target scallop across a relatively wide area offshore and throughout the Irish Sea. An average annual first sales value of € 333,000 landings of king scallop is taken specifically within the study area by Irish dredging vessels (data source: SFPA, 2020) and £ 800,000 landings of queen scallop by UK vessels (data source: MMO, 2020). VMS data indicate some dredging within the easternmost extent of the array area and across the temporary occupation area (Figure 10). Activities within the temporary occupation area will be highly localised and temporary in nature and may include construction vessels manoeuvring into position, and anchors spread associated with barge, anchor handling vessels and anchor marking buoys. Data on a wider Irish Sea scale (see Figures 15 and 16 of the Commercial Fisheries Technical Baseline) indicates that scallop grounds to the north-east and south of the array area and temporary occupation area are significantly more important to these dredge fleets. The consequence of the impact to the Irish and UK dredge fleets is expected to cause minor loss of ability to carry on fishing activities, based on the limited overlap with the array area and the temporary nature of any activities within the temporary occupation area. It is noted that currently UK dredge vessels are not permitted to fish within the 6 to 12 NM limits due to the Trade and Cooperation's Agreement between the UK and EU. Northern Irish vessels are permitted from 0 to 6 NM under the Voisinage agreement. A review of the UK-EU Trade and Cooperation Agreement is due to start in May 2026, and dependant on the outcomes of this review, it is possible that reciprocal access may be restored within the time period of construction. The overall magnitude of impact is assessed as **Low adverse**.

9.13.13 *Otter and beam trawl fishery*: the Irish, UK and other EU trawling fleets (including otter trawl and beam trawl) targets a range of demersal species including nephrops, anglerfish, sole, plaice, thornback ray and blonde ray (as well as other round fish and flat fish species). VMS data indicate no otter trawl or beam trawl activity within the array area (Figure 10). The same data indicates highly significant nephrops grounds (targeted by otter trawls) to the north-east of the array area and significant beam trawl grounds targeted to the east of the array area, outside 12 NM. The consequence of the impact to the Irish, UK and other EU trawl fleets is expected to cause minor loss of ability to carry on fishing activities, based on the limited overlap with the array area. The overall magnitude of impact is assessed as **Low adverse**.

9.13.14 *Other fisheries*: the fishing fleets targeting mussel seed, razor shell and pelagic species are considered to have very limited and/or very occasional activity within the array area. The magnitude of these fleets is considered to be **Negligible**.

Table 10 Determination of magnitude for impact 1

Receptor	Extent	Duration	Frequency	Probability	Consequence	Overall magnitude
Irish potting fleet (whelk)	Moderate	Short term	Intermittent	Highly likely	Moderate	Medium adverse
Irish potting fleet (crab & lobster)	Low	Short term	Intermittent	Highly likely	Minor	Low adverse
Scallop dredge fleet (Irish and UK)	Low	Short term	Intermittent	Highly likely	Minor	Low adverse
Otter trawl fleet (Irish and UK)	Low	Short term	Intermittent	Highly likely	Slight	Low adverse
Beam trawl fleet (Irish, UK & Belgian)	Low	Short term	Intermittent	Highly likely	Slight	Low adverse
Mussel seed fishery (Irish)	Negligible	Short term	Intermittent	Highly likely	Negligible	Negligible
Razor shell fishery (Irish)	Negligible	Short term	Intermittent	Highly likely	Negligible	Negligible
Pelagic trawl fishery (Irish & UK)	Negligible	Short term	Intermittent	Highly likely	Negligible	Negligible

Sensitivity of receptors

9.13.15 *Whelk potting fishery*: the Irish potting fleet operate across distinct areas of ground, from the coastline out to beyond 12 NM. The whelk fishery that overlaps with the array area is targeted by approximately 24 vessels, that are considered to have a range of low-moderate levels of alternative fishing grounds dependant on the fishing areas targeted by individual vessels; is deemed to have medium vulnerability to this impact, have high value and moderate recoverability based on their ability to operate within areas of the array area that are not under active construction works. The sensitivity of this receptor is therefore, considered to be **Medium**.

9.13.16 *Crab and lobster potting fishery*: the Irish potting fleet operate across distinct areas of ground, from the coastline out to beyond 12 NM. The crab and lobster fishery is comprised of several vessels that occasionally operate within the array area and is considered to have moderate-high levels of alternative fishing grounds in comparison to the array area; is deemed to have medium vulnerability to this impact, have moderate recoverability and low-medium value (within the array area). The sensitivity of this receptor is therefore, considered to be **Low**.

9.13.17 *Dredge fishery:* the dredge fishery is comprised of approximately 15 vessels that occasionally operate within the array area and is considered to have moderate-high levels of alternative fishing grounds; is deemed to have low vulnerability to this impact, have moderate recoverability and medium value (within the array area). The sensitivity of this receptor is therefore, considered to be **Medium**.

9.13.18 *Otter and beam trawl fishery*: the otter and beam trawl fisheries are comprised of several vessels that may occasionally operate within the array area and is considered to have moderate-high levels of alternative fishing grounds; is deemed to have low vulnerability to this impact, have moderate recoverability and low value (within the array area). The sensitivity of this receptor is therefore, considered to be **Low**.

9.13.19 *Other fisheries*: the fishing fleets targeting mussel seed, razor shell and pelagic species are considered to have very limited and/or very occasional overlap within the array area. The sensitivity of these fleets is considered to be **Negligible**.

Table 11 Determination of sensitivity for commercial fisheries to impact 1

Receptor	Context			Value	Overall sensitivity
	Adaptability	Tolerance	Recoverability		
Irish potting fleet (whelk)	Low-moderate levels of alternative grounds	Medium vulnerability	Moderate recoverability	High value	Medium
Irish potting fleet (crab & lobster)	Moderate-high levels of alternative grounds	Medium vulnerability	Moderate recoverability	Low-medium value	Low
Scallop dredge fleet (Irish and UK)	Moderate-high levels of alternative grounds	Low vulnerability	Moderate recoverability	Medium value	Medium
Otter trawl fleet (Irish and UK)	Moderate-high levels of alternative grounds	Low vulnerability	Moderate recoverability	Low value	Low
Beam trawl fleet (Irish, UK & Belgian)	Moderate-high levels of alternative grounds	Low vulnerability	Moderate recoverability	Low value	Low
Mussel seed fishery (Irish)	High levels of alternative ground	Low vulnerability	High recoverability	Low value	Negligible
Razor shell fishery (Irish)	High levels of alternative ground	Low vulnerability	Moderate recoverability	Very low	Negligible
Pelagic trawl fishery (Irish & UK)	High levels of alternative areas	Low vulnerability	High recoverability	Very low	Negligible

Significance of effects

9.13.20 *Whelk potting fishery*: Overall, it is predicted that the sensitivity of the receptor is **Medium,** and the magnitude is **Medium adverse**. The effect is **Moderate adverse**, which is considered to be significant in EIA terms due to the high dependence of the local fleet on the whelk grounds that overlap the array area. The Applicant is committed to delivering further mitigation as described below.

9.13.21 *Crab and lobster potting fishery*: Overall, it is predicted that the sensitivity of the receptor is **Low,** and the magnitude is **Low adverse**. The effect is **Slight adverse**, which is not significant in EIA terms.

9.13.22 *Dredge fishery*: Overall, it is predicted that the sensitivity of the receptor is **Medium,** and the magnitude is **Low adverse**. The effect is **Slight adverse**, which is not significant in EIA terms.

9.13.23 *Otter and beam trawl fishery*: Overall, it is predicted that the sensitivity of the receptor is **Low,** and the magnitude is **Low adverse**. The effect is **Slight adverse**, which is not significant in EIA terms.

9.13.24 *All other fisheries*: Overall, it is predicted that the sensitivity of the receptor is **Negligible,** and the magnitude is **Negligible**. The effect is **Imperceptible**, which is not significant in EIA terms.

9.13.25 The alternative design options (any other option within the range of parameters set out in the project description) will not give rise to an effect which is more significant than the maximum design option.

Proposed mitigation

9.13.26 In order to mitigate the potential effects on the whelk fishery during the construction phase, the Applicant has developed a FMMS, which defines options to encourage co-existence and further mitigate the effect, including, where appropriate, cooperation agreements and associated payments where residual impacts remain after mitigations and minimisations are applied. The impact assessment has found a moderate adverse impact for the whelk potting fishery, which is considered significant for this commercial fisheries receptor, and therefore the Applicant has committed to delivering cooperation agreements with individual fishing vessel businesses, as defined in the FMMS.

9.13.27 With respect to any cooperation agreements and associated payments, an evidence based procedure will be followed. This will include provision of evidence and data, examples of which are provided below, with further details in the FMMS:

- Copy of the relevant vessel registry, fishing licences and entitlements;
- Provision of spatial fishing track record data which provides clear historic evidence of potential disruption in the area of the operations;
- Evidence of sales notes and/or fishing accounts where available for an agreed time period; and
- Fishing vessel or and/or fisheries landings data held by fisheries authorities.

9.13.28 With the commitments defined in the FMMS including cooperation agreements and associated payments for the Irish whelk potting fleet, the impact magnitude is reduced to **Low adverse,** and the residual effect is of **Slight adverse** significance, which is not significant in EIA terms.

Residual effect assessment

In relation to both MDO and ADO, with the effective implementation of the measures detailed above, ***no significant adverse residual effects*** *have been predicted in respect of commercial fisheries.*

9.13.29 A summary of the residual effect assessment is provided in Table 12.

Table 12 Summary of residual effect assessment for impact 1

Receptor	Magnitude	Sensitivity	Effect	Additional mitigation	Residual effect
Irish potting fleet (whelk)	Medium adverse	Medium	Moderate adverse	Yes	Slight adverse
Irish potting fleet (crab & lobster)	Low adverse	Low	Slight adverse	N/A	Slight adverse
Scallop dredge fleet (Irish and UK)	Low adverse	Medium	Slight adverse	N/A	Slight adverse
Otter trawl fleet (Irish and UK)	Low adverse	Low	Slight adverse	N/A	Slight adverse
Beam trawl fleet (Irish, UK & Belgian)	Low adverse	Low	Slight adverse	N/A	Slight adverse
Mussel seed fishery (Irish)	Negligible	Negligible	Imperceptible	N/A	Imperceptible
Razor shell fishery (Irish)	Negligible	Negligible	Imperceptible	N/A	Imperceptible
Pelagic trawl fishery (Irish & UK)	Negligible	Negligible	Imperceptible	N/A	Imperceptible

Impact 2: Offshore export cable construction activities and physical presence of constructed infrastructure leading to reduction in access to, or exclusion from established fishing grounds.

9.13.30 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).

9.13.31 As per Table 8, the MDO for this impact has been identified as the maximum duration and extent of fishing exclusion throughout the construction phase and hence the greatest potential to restrict access to fishing grounds. The Offshore ECC will have approximately 154 days of installation activities within a maximum construction period of 30 months; the duration is therefore short-term.

9.13.32 The construction footprint comprises the full Offshore ECC including scour protection, cable crossings and cable protection plus the temporary footprint of seabed preparatory works. The impact area also incorporates exclusion zones around major activities.

9.13.33 As per Table 9, avoidance and preventative measures for this impact includes the measures with the PEMP, advisory safe passing distances, guard vessels, and regular fisheries liaison as defined in the FMMS.

Magnitude of impact

9.13.34 *Whelk potting fishery*: The whelk fishery is known to operate across the Offshore ECC, as indicated by fisheries mapping for <15 m length potting vessels (Figure 9), landing statistics and industry consultation. The information relevant to this impact is as described in paragraphs 9.13.6 to 9.13.15.

9.13.35 The consequence of the impact to the potting fleet targeting whelk is assessed as moderate, based on the potential moderate loss of ability to carry on fishing activities, noting that the vessels within the fleet under assessment have a moderate proportion of effort across the Offshore ECC and an overall moderate-high value. Potting gear would be required to be re-located during the installation process, however this will affect a smaller proportion of gear for less time compared to the array area, and this impact will not be continuous throughout the whole construction period. The overall maximum magnitude of impact is assessed as **Medium adverse**.

9.13.36 *Crab and lobster potting fishery*: while the limited activity is recorded by the Irish potting fleet targeting crab and lobster, based on mapping of vessels <15 m in length (see Figure 12 of the Commercial Fisheries Technical Baseline), consultation indicates that a small number of local vessels routinely operate potting gear across the Offshore ECC while targeting brown crab and lobster. It is noted that the Offshore ECC is not exclusively targeted by any one fisher, and that gear is deployed across a range of grounds not limited to the Offshore ECC. This is not corroborated by landing statistics, although uncertainties are identified with this dataset, specifically related to small vessels that are typical of those targeting inshore grounds.

9.13.37 With due regard to fishing industry consultation, coupled with the typical operational range of smaller inshore vessels, the consequence of the impact to the potting fleet targeting crab and lobster is expected to cause minor-moderate loss of ability to carry on fishing activities, covering a moderate extent of grounds available to this fleet. It is noted that there is higher activity by this fleet across the inshore areas and the Offshore ECC than compared to the array area. The overall magnitude of impact is assessed as **Medium adverse**.

9.13.38 *Dredge fishery:* the Irish and UK dredging fleet target scallop across a relatively wide area offshore and throughout the Irish Sea. Data on landing statistics for the study area is as described in paragraph 9.13.12. VMS data indicate no dredging activity within the Offshore ECC (Figure 10). Consultation with the industry indicate some inshore activity, but that the Offshore ECC is not routinely fished. The consequence of the impact to the Irish and UK dredge fleets is expected to cause minor loss of ability to carry on fishing activities, based on the limited and occasional overlap with the Offshore ECC. The overall magnitude of impact is assessed as **Low adverse**.

9.13.39 *Otter trawl fishery*: information and data on landing statistics for otter trawl activity within the study area is as described in paragraph 9.13.13. VMS data indicate some otter trawl activity within the Offshore ECC (Figure 10), although the same data indicates highly significant nephrops grounds (targeted by otter trawls) to the north-east of the array area. The consequence of the impact to the otter trawl fleet is expected to cause a slight loss of ability to carry on fishing activities, based on the limited overlap with the Offshore ECC. The overall magnitude of impact is assessed as **Low adverse**.

9.13.40 *Beam trawl fishery*: information and data on landing statistics for beam trawl activity within the study area is as described in paragraph 9.13.13. VMS data indicate no beam trawl activity within the Offshore ECC (Figure 10). The consequence of the impact to the beam trawl fleet is expected to cause a negligible loss of ability to carry on fishing activities, based on minimal overlap with the Offshore ECC. The overall magnitude of impact is assessed as **Negligible**.

9.13.41 *Other fisheries*: the fishing fleets targeting mussel seed, razor shell and pelagic species are considered to have very limited and/or very occasional activity within the Offshore ECC. The magnitude and sensitivity of these fleets is considered to be **Negligible**.

Table 13 Determination of magnitude for impact 2

Receptor	Extent	Duration	Frequency	Probability	Consequence	Overall magnitude
Irish potting fleet (whelk)	Moderate	Short term	Intermittent	Highly likely	Moderate	Medium adverse
Irish potting fleet (crab & lobster)	Moderate	Short term	Intermittent	Highly likely	Moderate	Medium adverse
Scallop dredge fleet (Irish and UK)	Low	Short term	Intermittent	Highly likely	Minor	Low adverse
Otter trawl fleet (Irish and UK)	Low	Short term	Intermittent	Highly likely	Slight	Low adverse
Beam trawl fleet (Irish, UK & Belgian)	Negligible	Short term	Intermittent	Highly likely	Negligible	Negligible
Mussel seed fishery (Irish)	Negligible	Short term	Intermittent	Highly likely	Negligible	Negligible
Razor shell fishery (Irish)	Negligible	Short term	Intermittent	Highly likely	Negligible	Negligible
Pelagic trawl fishery (Irish & UK)	Negligible	Short term	Intermittent	Highly likely	Negligible	Negligible

Sensitivity of receptors

9.13.42 *Whelk potting fishery*: The Irish potting fleet operate across distinct areas of ground, from the coastline out to beyond 12 NM. The whelk fishery that overlaps with the Offshore ECC is targeted by approximately 24 vessels, that are considered to have low-moderate levels of alternative fishing grounds dependant on the fishing areas targeted by individual vessels; is deemed to have medium vulnerability to this impact, have high value and moderate recoverability based on their ability to adapt and recover to normal levels of fishing effort. The sensitivity of this receptor is therefore, considered to be **Medium**.

9.13.43 *Crab and lobster potting fishery*: the Irish potting fleet operate across distinct areas of ground, from the coastline out to beyond 12 NM. The crab and lobster fishery is comprised of several vessels that routinely operate within the Offshore ECC and is considered to have low-moderate levels of alternative fishing grounds; is deemed to have medium vulnerability to this impact, have moderate recoverability and medium value. The sensitivity of this receptor is therefore, considered to be **Medium**.

9.13.44 *Dredge fishery:* the dredge fishery is comprised of several vessels that very occasionally operate within the Offshore ECC and is considered to have high levels of alternative fishing grounds; is deemed to have low vulnerability to this impact, have moderate recoverability and low value (within the Offshore ECC). The sensitivity of this receptor is therefore, considered to be **Low**.

9.13.45 *Otter trawl fishery*: The sensitivity of this receptor is as described in paragraph 9.13.18 and is therefore, considered to be **Low**.

9.13.46 *Beam trawl fishery*: The sensitivity of this receptor is as described in paragraph 9.13.18 and is therefore, considered to be **Low**.

9.13.47 *Other fisheries*: the fishing fleets targeting mussel seed, razor shell and pelagic species are considered to have very limited and/or very occasional activity within the Offshore ECC. The sensitivity of these fleets is considered to be **Negligible**.

Table 14 Determination of sensitivity for commercial fisheries to impact 2

Receptor	Context			Value	Overall sensitivity
	Adaptability	Tolerance	Recoverability		
Irish potting fleet (whelk)	Low-moderate levels of alternative grounds	Medium vulnerability	Moderate recoverability	High value	Medium
Irish potting fleet (crab & lobster)	Low-moderate levels of alternative grounds	Medium vulnerability	Moderate recoverability	Medium value	Medium
Scallop dredge fleet (Irish and UK)	High levels of alternative grounds	Low vulnerability	Moderate recoverability	Low value	Low
Otter trawl fleet (Irish and UK)	Moderate-high levels of alternative grounds	Low vulnerability	Moderate recoverability	Low value	Low

Receptor	Context			Value	Overall sensitivity
	Adaptability	Tolerance	Recoverability		
Beam trawl fleet (Irish, UK & Belgian)	Moderate-high levels of alternative grounds	Low vulnerability	Moderate recoverability	Low value	Low
Mussel seed fishery (Irish)	High levels of alternative ground	Low vulnerability	High recoverability	Low	Negligible
Razor shell fishery (Irish)	High levels of alternative ground	Low vulnerability	High recoverability	Very low	Negligible
Pelagic trawl fishery (Irish & UK)	High levels of alternative areas	Low vulnerability	High recoverability	Very low	Negligible

Significance of effects

9.13.48 *Whelk potting fishery*: Overall, it is predicted that the sensitivity of the receptor is **Medium,** and the magnitude is **Medium adverse**. The effect is **Moderate adverse**, which is significant in EIA terms. Further mitigation is therefore proposed below.

9.13.49 *Crab and lobster potting fishery*: Overall, it is predicted that the sensitivity of the receptor is **Medium,** and the magnitude is **Medium adverse**. The effect is **Moderate adverse**, which is significant in EIA terms. Further mitigation is therefore proposed below.

9.13.50 *Dredge fishery*: Overall, it is predicted that the sensitivity of the receptor is **Low,** and the magnitude is **Low adverse**. The effect is **Slight adverse**, which is not significant in EIA terms.

9.13.51 *Otter trawl fishery*: Overall, it is predicted that the sensitivity of the receptor is **Low,** and the magnitude is **Low adverse**. The effect is **Slight adverse**, which is not significant in EIA terms.

9.13.52 *Beam trawl fishery*: Overall, it is predicted that the sensitivity of the receptor is **Low,** and the magnitude is **Negligible**. The effect is **Not significant**, which is not significant in EIA terms.

9.13.53 *All other fisheries*: Overall, it is predicted that the sensitivity of the receptor is **Negligible,** and the magnitude is **Negligible**. The effect is **Imperceptible**, which is not significant in EIA terms.

9.13.54 The alternative design options (any other option within the range of parameters set out in the project description) will not give rise to an effect which is more significant than the maximum design option.

Proposed mitigation

9.13.55 The proposed mitigation is as described in paragraph 9.13.26 and will be implemented for the Irish potting fleet targeting whelk, crab and lobster.

9.13.56 In order to mitigate the potential effects on the whelk, crab and lobster fisheries during the construction phase of the Offshore ECC, the Applicant has developed a FMMS, which defines options to encourage co-existence and further mitigate the effect, including, where appropriate, cooperation agreements and associated payments where residual impacts remain after mitigations and minimisations are applied. The impact assessment has found a moderate adverse impact for the whelk potting fishery and the crab and lobster potting fishery, which is considered significant for these commercial fisheries receptors, and therefore the Applicant has committed to delivering cooperation agreements with individual fishing vessel businesses, as defined in the FMMS.

9.13.57 With respect to any cooperation agreements and associated payments, an evidence based procedure will be followed. This will include provision of evidence and data, examples of which are provided below, with further details in the FMMS:

- Copy of the relevant vessel registry, fishing licences and entitlements;
- Provision of spatial fishing track record data which provides clear historic evidence of potential disruption in the area of the operations;
- Evidence of sales notes and/or fishing accounts where available for an agreed time period; and
- Fishing vessel or and/or fisheries landings data held by fisheries authorities.

9.13.58 With the commitment to development of an FMMS that will explore mitigation options including cooperation agreements and associated payments for the Irish whelk potting fleet and Irish crab and lobster potting fleet, the impact magnitude is reduced to **Low adverse,** and the residual effect is of **Slight adverse** significance, which is not significant in EIA terms.

Residual effect assessment

In relation to both MDO and ADO, with the effective implementation of the measures detailed above, ***no significant adverse residual effects*** *have been predicted in respect of commercial fisheries.*

9.13.59 A summary of the residual effect assessment is provided in Table 15.

Table 15 Summary of residual effect assessment for impact 2

Receptor	Magnitude	Sensitivity	Effect	Additional mitigation	Residual effect
Irish potting fleet (whelk)	Medium adverse	Medium	Moderate adverse	Yes	Slight adverse
Irish potting fleet (crab & lobster)	Medium adverse	Medium	Moderate adverse	Yes	Slight adverse
Scallop dredge fleet (Irish and UK)	Low adverse	Low	Slight adverse	N/A	Slight adverse

Receptor	Magnitude	Sensitivity	Effect	Additional mitigation	Residual effect
Otter trawl fleet (Irish and UK)	Low adverse	Low	Slight adverse	N/A	Slight adverse
Beam trawl fleet (Irish, UK & Belgian)	Negligible	Low	Not significant	N/A	Not significant
Mussel seed fishery (Irish)	Negligible	Negligible	Imperceptible	N/A	Imperceptible
Razor shell fishery (Irish)	Negligible	Negligible	Imperceptible	N/A	Imperceptible
Pelagic trawl fishery (Irish & UK)	Negligible	Negligible	Imperceptible	N/A	Imperceptible

Impact 3: Displacement from array area and Offshore ECC leading to gear conflict and increased fishing pressure on adjacent grounds.

9.13.60 Localised exclusion from fishing grounds during construction of offshore infrastructure within the array area and Offshore ECC, 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.

9.13.61 The impact is predicted to be of regional spatial extent, short-term duration, intermittent and with medium reversibility. It is predicted that the impact will affect the receptor directly. The impact is of relevance to national fishing fleets as described below.

Magnitude of impact

9.13.62 *Potting fishery*: conflict over diminished grounds may occur if displaced potting gear is relocated into actively fished potting grounds. In practice, conflict can lead to the entanglement of potting lines, which is time consuming to separate and can create operational difficulties (for example, the lines have to be cut and re-tied at each pot to disentangle and reassemble the string of pots).

9.13.63 When considering the impact of potters being displaced from the array area and/or 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.

9.13.64 On balance, the displacement effect to potters targeting the array area and/or ECC is considered to have a lower magnitude of impact than the exclusion impact causing the displacement (Impact 1: Array area construction activities and physical presence of constructed wind farm infrastructure leading to reduction in access to, or exclusion from established fishing grounds. and Impact 2: Offshore export cable construction activities and physical presence of constructed infrastructure leading to reduction in access to, or exclusion from established fishing grounds.). The assessment finds that emphasis placed on effective mitigation of the exclusion impacts (set out in paragraphs 9.13.6 to 9.13.16 and 9.13.34 to 9.13.43) will minimise the displacement effect. Taking all these aspects into consideration, the magnitude of the displacement impact is assessed to be **Low adverse** for the potting fleets targeting whelk and crab and lobster.

9.13.65 *Dredge, otter trawl and beam trawl fisheries*: displacement from the array area and/or ECC is not expected to affect the dredge, otter trawl or beam trawl fisheries since key fishing grounds and activity are located outside of the array area and offshore ECC. The magnitude of the displacement impact is assessed to be **Low adverse.**

9.13.66 *All other fisheries*: the fishing fleets targeting mussel seed, razor shell and pelagic species are considered to have very limited and/or very occasional activity within the Offshore ECC. The magnitude and sensitivity of these fleets is considered to be **Negligible**.

Table 16 Determination of magnitude for impact 3

Receptor	Extent	Duration	Frequency	Probability	Consequence	Overall magnitude
Irish potting fleet (whelk)	Low	Short term	Intermittent	Likely	Minor	Low adverse
Irish potting fleet (crab & lobster)	Low	Short term	Intermittent	Likely	Minor	Low adverse
Scallop dredge fleet (Irish and UK)	Low	Short term	Intermittent	Likely	Minor	Low adverse
Otter trawl fleet (Irish and UK)	Low	Short term	Intermittent	Likely	Slight	Low adverse
Beam trawl fleet (Irish, UK & Belgian)	Low	Short term	Intermittent	Likely	Slight	Low adverse
Mussel seed fishery (Irish)	Negligible	Short term	Intermittent	Likely	Negligible	Negligible
Razor shell fishery (Irish)	Negligible	Short term	Intermittent	Likely	Negligible	Negligible
Pelagic trawl fishery (Irish & UK)	Negligible	Short term	Intermittent	Likely	Negligible	Negligible

Sensitivity of receptors

9.13.67 *Potting fishery*: The potting fleet operate across distinct areas of ground, from the coastline out to beyond 12 NM. This form of static fishing gear is considered to have a high vulnerability to gear conflict interactions since it is left unattended on the seabed. Displacement from the array area and/or ECC may lead to exploration of alternative grounds including areas currently targeted by potters and depending upon location, dredgers. The potting fleet is, therefore, deemed to be of moderate adaptability, generally vulnerable, with moderate recoverability and medium value. The sensitivity of the potting fleet is therefore, considered to be **Medium**.

9.13.68 *Dredge, otter trawl and beam trawl fisheries*: The sensitivity of these receptors is as described in paragraphs 9.13.44 to 9.13.46 and is therefore, considered to be **Low**.

9.13.69 *Other fisheries*: the fishing fleets targeting mussel seed, razor shell and pelagic species are considered to have very limited and/or very occasional activity within the array area and Offshore ECC. The sensitivity of these fleets is considered to be **Negligible**.

Table 17 Determination of sensitivity for commercial fisheries to impact 3

Receptor	Context			Value	Overall sensitivity
	Adaptability	Tolerance	Recoverability		
Irish potting fleet (whelk)	Low levels of alternative grounds	Medium vulnerability	High recoverability	Medium-high value	Medium
Irish potting fleet (crab & lobster)	Moderate levels of alternative grounds	Medium vulnerability	High recoverability	Medium value	Medium
Scallop dredge fleet (Irish and UK)	Moderate levels of alternative grounds	Low vulnerability	High recoverability	Low value	Low
Otter trawl fleet (Irish and UK)	Moderate levels of alternative grounds	Low vulnerability	High recoverability	Low value	Low
Beam trawl fleet (Irish, UK & Belgian)	Moderate levels of alternative grounds	Low vulnerability	High recoverability	Low value	Low
Mussel seed fishery (Irish)	High levels of alternative ground	Low vulnerability	High recoverability	Low	Negligible
Razor shell fishery (Irish)	High levels of alternative ground	Low vulnerability	High recoverability	Very low	Negligible
Pelagic trawl fishery (Irish & UK)	High levels of alternative areas	Low vulnerability	High recoverability	Very low	Negligible

Significance of effects

9.13.70 *Potting fisheries*: Overall, it is predicted that the sensitivity of the receptor is **Medium,** and the magnitude is **Low adverse**. The effect is **Slight adverse**, which is not significant in EIA terms.

9.13.71 *Dredge, otter trawl and beam trawl fisheries*: Overall, it is predicted that the sensitivity of the receptor is **Low,** and the magnitude is **Low adverse**. The effect is **Slight adverse**, which is not significant in EIA terms.

9.13.72 *All other fisheries*: Overall, it is predicted that the sensitivity of the receptor is **Negligible,** and the magnitude is **Negligible**. The effect is **Imperceptible**, which is not significant in EIA terms.

9.13.73 The alternative design options (any other option within the range of parameters set out in the project description) will not give rise to an effect which is more significant than the maximum design option.

Residual effect assessment

9.13.74 A summary of the residual effect assessment is provided in Table 18.

The significance of effect is not significant in EIA terms. Therefore, no additional mitigation to that already identified in Table 9 are considered necessary. Therefore, ***no significant adverse residual effects*** *have been predicted in respect of commercial fisheries.*

Table 18 Summary of residual effect assessment for impact 3

Receptor	Magnitude	Sensitivity	Effect	Additional mitigation	Residual effect
Irish potting fleet (whelk)	Low adverse	Medium	Slight adverse	N/A	Slight adverse
Irish potting fleet (crab & lobster)	Low adverse	Medium	Slight adverse	N/A	Slight adverse
Scallop dredge fleet (Irish and UK)	Low adverse	Low	Slight adverse	N/A	Slight adverse
Otter trawl fleet (Irish and UK)	Low adverse	Low	Slight adverse	N/A	Slight adverse
Beam trawl fleet (Irish, UK & Belgian)	Low adverse	Low	Slight adverse	N/A	Slight adverse
Mussel seed fishery (Irish)	Negligible	Negligible	Imperceptible	N/A	Imperceptible
Razor shell fishery (Irish)	Negligible	Negligible	Imperceptible	N/A	Imperceptible
Pelagic trawl fishery (Irish & UK)	Negligible	Negligible	Imperceptible	N/A	Imperceptible

Impact 4: Array area and Offshore ECC construction activities leading to disturbance of commercially important fish and shellfish resources leading to displacement or disruption of fishing activity.

9.13.75 Temporary noise and seabed disturbances during construction activities may 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 would be affected.

9.13.76 Detailed assessments of the following potential construction impacts have been undertaken in the Fish and Shellfish Ecology Chapter:

- Temporary increase in Suspended Sediment Concentrations (SSC) and sediment deposition arising during construction activities;
- Temporary damage and disturbance of the seabed during construction activities;
- Reduction in water and sediment quality through the release of contaminated sediments and/or accidental contamination; and
- Introduction of underwater noise and vibration leading to mortality, injury, TTS and/or behavioural changes, or auditory masking.

Magnitude of impact

9.13.77 With respect to the magnitude of this impact on commercial fisheries, the overall significance of the effect on fish and shellfish species is considered (i.e. both the magnitude and sensitivity of fish and shellfish species are considered to assess the magnitude on commercial fishing fleets). This is because the overall effect on the fish and/or shellfish species relates directly to the availability and amount of exploitable resource. For instance, where an effect of negligible significance is assessed for a species, a negligible magnitude is assessed for commercial fishing; where an effect of minor adverse significance is assessed for a species, a low magnitude is assessed for commercial fishing, and so on.

9.13.78 Details of the fish and shellfish ecology assessment are summarised in Table 19, with Slight adverse significant effect assessed for each impact and fish and shellfish receptors; justifications for this assessment will not be repeated in this chapter. Evidence, modelling and justifications for these assessments are provided in the Fish and Shellfish Ecology Chapter.

Table 19 Significance of effects of construction impacts on fish and shellfish ecology.

Potential impact	Magnitude	Sensitivity	Significance of effect
Temporary increase in suspended sediment concentration (SSC) and sediment deposition as a result of construction activities	Low adverse	Medium	Slight adverse
Temporary damage and disturbance of the seabed during construction activities	Low adverse	Medium	Slight adverse

Potential impact	Magnitude	Sensitivity	Significance of effect
Reduction in water and sediment quality through the release of contaminated sediments and/or accidental contamination	Negligible	Medium	Not significant
Introduction of underwater noise and vibration leading to mortality, injury, behavioral changes, or auditory masking	Low adverse	Medium	Slight adverse

9.13.79 *All commercial fishing fleets:* the impact is predicted to be of regional spatial extent, of relevance to national 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 **Low adverse** for potential impacts to potting, dredge, otter trawl and beam trawl fisheries and **Negligible** to all other fisheries.

Table 20 Determination of magnitude for impact 4

Receptor	Extent	Duration	Frequency	Probability	Consequence	Overall magnitude
Irish potting fleet (whelk)	Low	Short term	Intermittent	Likely	Minor	Low adverse
Irish potting fleet (crab & lobster)	Low	Short term	Intermittent	Likely	Minor	Low adverse
Scallop dredge fleet (Irish and UK)	Low	Short term	Intermittent	Likely	Minor	Low adverse
Otter trawl fleet (Irish and UK)	Low	Short term	Intermittent	Likely	Slight	Low adverse
Beam trawl fleet (Irish, UK & Belgian)	Low	Short term	Intermittent	Likely	Slight	Low adverse
Mussel seed fishery (Irish)	Negligible	Short term	Intermittent	Likely	Negligible	Negligible
Razor shell fishery (Irish)	Negligible	Short term	Intermittent	Likely	Negligible	Negligible
Pelagic trawl fishery (Irish & UK)	Negligible	Short term	Intermittent	Likely	Negligible	Negligible

Sensitivity of receptors

9.13.80 *Potting and dredge fisheries:* 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, specifically potting and dredge fisheries targeting benthic shellfish species (including whelk, crab, lobster and scallop) that have limited ability to move. The sensitivity of the receptor for all potting and dredge fleets is therefore considered to be **Medium**.

9.13.81 *All other fisheries:* due to the range of alternative areas targeted and the distribution of other commercial species throughout the Irish Sea, fleets are deemed to be of low vulnerability, high recoverability and low value. The sensitivity is therefore considered to be **Low** for otter and beam trawl fleets and **Negligible** for all other fleets.

Table 21 Determination of sensitivity for commercial fisheries to impact 4

Receptor	Context			Value	Overall sensitivity
	Adaptability	Tolerance	Recoverability		
Irish potting fleet (whelk)	Low levels of alternative grounds	Medium vulnerability	Recovery is slow or costly	Medium-high value	Medium
Irish potting fleet (crab & lobster)	Moderate levels of alternative grounds	Medium vulnerability	Recovery is slow or costly	Medium value	Medium
Scallop dredge fleet (Irish and UK)	Moderate levels of alternative grounds	Low vulnerability	Moderate recoverability	Medium value	Medium
Otter trawl fleet (Irish and UK)	Moderate levels of alternative grounds	Low vulnerability	Moderate recoverability	Low value	Low
Beam trawl fleet (Irish, UK & Belgian)	Moderate levels of alternative grounds	Low vulnerability	Moderate recoverability	Low value	Low
Mussel seed fishery (Irish)	High levels of alternative ground	Low vulnerability	High recoverability	Very low value	Negligible
Razor shell fishery (Irish)	High levels of alternative ground	Low vulnerability	Moderate recoverability	Very low value	Negligible
Pelagic trawl fishery (Irish & UK)	High levels of alternative areas	Low vulnerability	High recoverability	Very low value	Negligible

Significance of effects

9.13.82 *Potting and dredge fisheries*: Overall, it is predicted that the sensitivity of the receptor is **Medium,** and the magnitude is **Low adverse**. The effect is **Slight adverse**, which is not significant in EIA terms.

9.13.83 *Otter trawl and beam trawl fisheries*: Overall, it is predicted that the sensitivity of the receptor is **Low,** and the magnitude is **Low adverse**. The effect is **Slight adverse**, which is not significant in EIA terms.

9.13.84 *All other fisheries*: Overall, it is predicted that the sensitivity of the receptor is **Negligible,** and the magnitude is **Negligible**. The effect is **Imperceptible**, which is not significant in EIA terms.

9.13.85 The alternative design options (any other option within the range of parameters set out in the project description) will not give rise to an effect which is more significant than the maximum design option.

Residual effect assessment

9.13.86 A summary of the residual effect assessment is provided in Table 22.

The significance of effect is not significant in EIA terms. Therefore, no additional mitigation to that already identified in Table 9 are considered necessary. Therefore, ***no significant adverse residual effects*** *have been predicted in respect of commercial fisheries.*

Table 22 Summary of residual effect assessment for impact 4

Receptor	Magnitude	Sensitivity	Effect	Additional mitigation	Residual effect
Irish potting fleet (whelk)	Low adverse	Medium	Slight adverse	N/A	Slight adverse
Irish potting fleet (crab & lobster)	Low adverse	Medium	Slight adverse	N/A	Slight adverse
Scallop dredge fleet (Irish and UK)	Low adverse	Medium	Slight adverse	N/A	Slight adverse
Otter trawl fleet (Irish and UK)	Low adverse	Low	Slight adverse	N/A	Slight adverse
Beam trawl fleet (Irish, UK & Belgian)	Low adverse	Low	Slight adverse	N/A	Slight adverse
Mussel seed fishery (Irish)	Negligible	Negligible	Imperceptible	N/A	Imperceptible
Razor shell fishery (Irish)	Negligible	Negligible	Imperceptible	N/A	Imperceptible
Pelagic trawl fishery (Irish & UK)	Negligible	Negligible	Imperceptible	N/A	Imperceptible

Impact 5: Increased vessel traffic associated with Dublin Array within fishing grounds leading to interference with fishing activity.

9.13.87 This assessment focuses on the potential impact of Dublin Array- 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.

9.13.88 Vessel movements (i.e. construction vessels transiting to and from areas undergoing construction works) related to the construction of Dublin Array will add to the existing level of shipping activity in the area (see the Shipping and Navigation Chapter for a full assessment of additional vessel movements).

9.13.89 Continuous liaison with the fishing industry will be undertaken including location and duration of construction activities; further details will be provided in an outline FMMS which will be included as part of the Application.

Magnitude of impact

9.13.90 With sufficient notice, all fishing fleets are considered to be able to avoid vessel movements related to Dublin Array construction[7]. 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 potting, dredge, otter trawl and beam trawl fisheries and **Negligible** for all other fisheries.

Table 23 Determination of magnitude for impact 5

Receptor	Extent	Duration	Frequency	Probability	Consequence	Overall magnitude
Irish potting fleet (whelk)	Moderate	Short term	Intermittent	Highly likely	Minor	Low adverse
Irish potting fleet (crab & lobster)	Low	Short term	Intermittent	Highly likely	Minor	Low adverse
Scallop dredge fleet (Irish and UK)	Low	Short term	Intermittent	Highly likely	Minor	Low adverse
Otter trawl fleet (Irish and UK)	Low	Short term	Intermittent	Highly likely	Slight	Low adverse
Beam trawl fleet (Irish, UK & Belgian)	Low	Short term	Intermittent	Highly likely	Slight	Low adverse
Mussel seed fishery (Irish)	Negligible	Short term	Intermittent	Highly likely	Negligible	Negligible
Razor shell fishery (Irish)	Negligible	Short term	Intermittent	Highly likely	Negligible	Negligible
Pelagic trawl fishery (Irish & UK)	Negligible	Short term	Intermittent	Highly likely	Negligible	Negligible

Sensitivity of receptors

9.13.91 Construction traffic is likely to constrain most potting activity across established construction supply routes due to the vulnerability of the marker buoys to the propellers of passing construction vessels. It is noted that shipping routes do currently exist in the vicinity of Dublin Array, and that the construction vessels are likely to follow these existing routes where possible. The potting fisheries are deemed to be of medium vulnerability, moderate recoverability and low-medium value. The sensitivity of these receptors is therefore, considered to be **Medium**.

9.13.92 All other fishery fleets are expected to be in a position to avoid the Dublin Array construction areas. Dredge fisheries are deemed to be of negligible vulnerability, high recoverability and low-medium value. The sensitivity of the receptor is therefore, considered to be **Negligible**.

Table 24 Determination of sensitivity for commercial fisheries to impact 5

[7] The FMMS states that during all project life stages, Dublin Array will endeavour to circulate local notices and information no less than 14 days in advance of commencement of works where practicable and earlier if possible.

Receptor	Context			Value	Overall sensitivity
	Adaptability	Tolerance	Recoverability		
Irish potting fleet (whelk)	Low levels of alternative grounds	Medium vulnerability	Recovery is slow or costly	Medium-high value	Medium
Irish potting fleet (crab & lobster)	Moderate levels of alternative grounds	Medium vulnerability	Recovery is slow or costly	Medium value	Medium
Scallop dredge fleet (Irish and UK)	Moderate levels of alternative grounds	Low vulnerability	Moderate recoverability	Low value	Negligible
Otter trawl fleet (Irish and UK)	Moderate levels of alternative grounds	Low vulnerability	Moderate recoverability	Low value	Negligible
Beam trawl fleet (Irish, UK & Belgian)	Moderate levels of alternative grounds	Low vulnerability	Moderate recoverability	Low value	Negligible
Mussel seed fishery (Irish)	High levels of alternative ground	Low vulnerability	High recoverability	Low	Negligible
Razor shell fishery (Irish)	High levels of alternative ground	Low vulnerability	Moderate recoverability	Very low	Negligible
Pelagic trawl fishery (Irish & UK)	High levels of alternative areas	Low vulnerability	High recoverability	Very low	Negligible

Significance of effects

9.13.93 *Potting fisheries*: Overall, it is predicted that the sensitivity of the receptor is **Medium,** and the magnitude is **Low adverse**. The effect is **Slight adverse**, which is not significant in EIA terms.

9.13.94 *Scallop dredge, otter trawl and beam trawl fisheries*: Overall, it is predicted that the sensitivity of the receptor is **Negligible,** and the magnitude is **Low**. The effect is **Imperceptible**, which is not significant in EIA terms.

9.13.95 *All other fisheries*: Overall, it is predicted that the sensitivity of the receptor is **Negligible,** and the magnitude is **Negligible**. The effect is **Imperceptible**, which is not significant in EIA terms.

9.13.96 The alternative design options (any other option within the range of parameters set out in the project description) will not give rise to an effect which is more significant than the maximum design option.

Residual effect assessment

9.13.97 A summary of the residual effect assessment is provided in Table 25.

The significance of effect is not significant in EIA terms. Therefore, no additional mitigation to that already identified in Table 9 are considered necessary. Therefore, ***no significant adverse residual effects*** *have been predicted in respect of commercial fisheries.*

Table 25 Summary of residual effect assessment for impact 5

Receptor	Magnitude	Sensitivity	Effect	Additional mitigation	Residual effect
Irish potting fleet (whelk)	Low adverse	Medium	Slight adverse	N/A	Slight adverse
Irish potting fleet (crab & lobster)	Low adverse	Medium	Slight adverse	N/A	Slight adverse
Scallop dredge fleet (Irish and UK)	Low adverse	Negligible	Imperceptible	N/A	Imperceptible
Otter trawl fleet (Irish and UK)	Low adverse	Negligible	Imperceptible	N/A	Imperceptible
Beam trawl fleet (Irish, UK & Belgian)	Low adverse	Negligible	Imperceptible	N/A	Imperceptible
Mussel seed fishery (Irish)	Negligible	Negligible	Imperceptible	N/A	Imperceptible
Razor shell fishery (Irish)	Negligible	Negligible	Imperceptible	N/A	Imperceptible
Pelagic trawl fishery (Irish & UK)	Negligible	Negligible	Imperceptible	N/A	Imperceptible

9.14 Environmental assessment: operational phase

9.14.1 The environmental impacts arising from the operation and maintenance of Dublin Array are listed in Table 8, alongside the maximum design scenario against which each operation and maintenance phase impact has been assessed.

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

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

9.14.3 The assessment assumes that commercial fisheries will be prevented from actively fishing within the footprint of installed infrastructure within the array area through advisory exclusions via advisory safe passing distances around temporary maintenance activities, as set out in Table 8. The MDO relates to up to 50 turbines with multileg foundations and a minimum spacing of 944 m, including between turbines and all other infrastructure; one OSP; one met mast; two permanent vessel moorings and 120 km of inter-array cables with 20% length requiring additional protection. The greatest number of turbines and smallest value of minimum spacing results in the greatest potential impact based on the highest proportion of access restricted with the array area (compared to the alternative options of up to 45 turbines with 1000 m spacing and 39 turbines with 1,104 m spacing).

9.14.4 Outwith this area, the assessment assumes that fishing will not be prohibited from within the array area where turbine spacing and turbine layout allow productive grounds to be targeted. However, it is recognised that the level of fishing will not resume to full levels pre-construction of Dublin Array, due to the physical and hydrological constraints within the site. Specifically, this relates to the tide strength and operational procedures of the fishing vessels making working within the array area more complex, in particular the distance the vessel will travel while hauling gear in high tidal states. 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, trawl gears typically require a greater distance for safe operation and these gears are unlikely to target grounds in the vicinity of infrastructure.

9.14.5 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. The impact is predicted to be continuous with low reversibility for the lifetime of Dublin Array and is of relevance to national fishing fleets.

Magnitude of impact

9.14.6 Evidence on the value and importance of the array area to commercial fishing fleets is the same as that presented for construction in paragraphs 9.13.6 to 9.13.14.

9.14.7 *Potting fishery:* a potting fishery research study by Roach et al. (2018) investigated the effect of the construction and operation of the Westermost Rough offshore wind farm on established lobster fishing grounds (noting that this site lies approximately 8km off the Holderness coast in England, UK). 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 wind farm 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.

9.14.8 It is expected that potting activity will resume to some extent within the array area during the operation and maintenance phase. However, consultation with the fishing industry has repeatedly raised concern surrounding active fishing within the operational array area due to tidal strengths and drift during hauling of gear. Fishermen generally feel that it would be very difficult to operate within the operational wind farm in certain tidal conditions due to the direction that gear is set (from east to west) and the potential peak tidal strengths of 4.5-5 knots. Vessels may drift up to 1 NM within 15 minutes while hauling pots under these particular circumstances.

9.14.9 Based on the concerns expressed by the industry, and without further modelling of possible hydrodynamic and operational fishing gear scenarios, it is not possible to assume that fishing will resume to an extent close to pre-project conditions. With a minimum turbine spacing of 944 m[8] this is applicable across the entirety of the array area, and therefore has a moderate extent. Based on the value of the whelk fishery, the recognition of the importance of this area to the local fleets under assessment, coupled with considerable stakeholder concern, it is assessed to potentially lead to a substantial loss of ability to carry on fishing activities and access to the whelk resource within the array area. The magnitude of the impact is therefore considered to be **Medium adverse**. This assessment takes into account uncertainty as to the extent to which fishing may resume within the array area and is therefore recognised as precautionary.

9.14.10 *Potting for crab and lobster, dredge, otter trawl and beam trawl fisheries:* while occasional activity is noted, the presence of the array area is not expected to restrict the baseline operation of these fisheries. The magnitude of the impact is therefore considered to be **Low adverse**.

9.14.11 All other fisheries: the mussel seed, razor shell and pelagic fisheries do not target the array area and are not expected to do so during the operational phase. The magnitude of the impact is therefore considered to be **Negligible**.

[8] While spacing between turbines may be irregular across the array, the minimum centre-to-centre distance is 944 m subject to any micro-siting correction for individual turbines as may be required based on specific ground and seabed conditions at any particular location (see the Project Description Chapter).

Table 26 Determination of magnitude for impact 6

Receptor	Extent	Duration	Frequency	Probability	Consequence	Overall magnitude
Irish potting fleet (whelk)	Moderate	Long term	Continuous & constant	Highly likely	Moderate	Medium adverse
Irish potting fleet (crab & lobster)	Low	Long term	Continuous & constant	Highly likely	Minor	Low adverse
Scallop dredge fleet (Irish and UK)	Low	Long term	Continuous & constant	Highly likely	Minor	Low adverse
Otter trawl fleet (Irish and UK)	Low	Long term	Continuous & constant	Highly likely	Slight	Low adverse
Beam trawl fleet (Irish, UK & Belgian)	Low	Long term	Continuous & constant	Highly likely	Slight	Low adverse
Mussel seed fishery (Irish)	Negligible	Long term	Continuous & constant	Highly likely	Negligible	Negligible
Razor shell fishery (Irish)	Negligible	Long term	Continuous & constant	Highly likely	Negligible	Negligible
Pelagic trawl fishery (Irish & UK)	Negligible	Long term	Continuous & constant	Highly likely	Negligible	Negligible

Sensitivity of receptors

9.14.12 The sensitivity of the commercial fisheries receptors is the same as that presented for construction, summarised as **Medium** for whelk potting and dredging fisheries; **Low** for crab and lobster potting, otter trawl and beam trawl fisheries; and **Negligible** for all other fisheries.

Table 27 Determination of sensitivity for commercial fisheries to impact 6

Receptor	Context			Value	Overall sensitivity
	Adaptability	Tolerance	Recoverability		
Irish potting fleet (whelk)	Low levels of alternative grounds	Generally vulnerable	Low recoverability	High value	Medium
Irish potting fleet (crab & lobster)	Moderate levels of alternative grounds	Generally vulnerable	Low recoverability	Low value (within array area)	Low
Scallop dredge fleet (Irish and UK)	Moderate levels of alternative grounds	Generally vulnerable	Low recoverability	Medium value	Medium
Otter trawl fleet (Irish and UK)	Moderate levels of alternative grounds	Generally vulnerable	Low recoverability	Low value (within array area)	Low
Beam trawl fleet (Irish, UK & Belgian)	Moderate levels of alternative grounds	Generally vulnerable	Low recoverability	Low value (within array area)	Low

Receptor	Context			Value	Overall sensitivity
	Adaptability	Tolerance	Recoverability		
Mussel seed fishery (Irish)	High levels of alternative ground	Somewhat vulnerable	Moderate recoverability	Low	Negligible
Razor shell fishery (Irish)	High levels of alternative ground	Somewhat vulnerable	Moderate recoverability	Very low	Negligible
Pelagic trawl fishery (Irish & UK)	High levels of alternative areas	Somewhat vulnerable	Moderate recoverability	Very low	Negligible

Significance of effects

9.14.13 *Whelk potting fishery*: Overall, taking a precautionary approach and reflecting the concerns and uncertainty expressed by the fishing industry, it is predicted that the sensitivity of the receptor is **Medium,** and the magnitude is **Medium adverse**. The effect is **Moderate adverse**, which is significant in EIA terms. Further mitigation is therefore proposed below.

9.14.14 *Crab and lobster potting fishery*: Overall, it is predicted that the sensitivity of the receptor is **Low,** and the magnitude is **Low adverse**. The effect is **Slight adverse**, which is not significant in EIA terms.

9.14.15 *Dredge fishery*: Overall, it is predicted that the sensitivity of the receptor is **Medium,** and the magnitude is **Low adverse**. The effect is **Slight adverse**, which is not significant in EIA terms.

9.14.16 *Otter and beam trawl fishery*: Overall, it is predicted that the sensitivity of the receptor is **Low,** and the magnitude is **Low adverse**. The effect is **Slight adverse**, which is not significant in EIA terms.

9.14.17 *All other fisheries*: Overall, it is predicted that the sensitivity of the receptor is **Negligible,** and the magnitude is **Negligible**. The effect is **Imperceptible**, which is not significant in EIA terms.

9.14.18 The alternative design options (any other option within the range of parameters set out in the project description) will not give rise to an effect which is more significant than the maximum design option.

Proposed mitigation

9.14.19 The Applicant is committed to delivering a FMMS, which includes actions to encourage co-existence and further mitigate the effect, including during the operational phase of Dublin Array.

9.14.20 The level of resumption of the whelk potting fishery within the array area is uncertain, and the assessment takes this uncertainty into account with a precautionarily assessment of magnitude with overall moderate adverse significance. As such the following mitigation is proposed:

- Gear trials to assess practicality of potting activity within the operational array area. This could include alterations to normal gear configurations, such as number of pots per string and/or direction the gear is set with respect to turbine locations;

- Monitoring of catch rates within the array area, including a control site outside the array area; and
- Commitment to review and update the FMMS based on the results and findings of the monitoring and gear trial campaigns. This provides opportunity to offer further mitigation if and where demonstrated necessary through the gear trials and monitoring.

9.14.21 With the above commitments to encourage and facilitate co-existence, the impact magnitude is reduced to **Low adverse,** and the residual effect is of **Slight adverse** significance, which is not significant in EIA terms.

Residual effect assessment

In relation to both MDO and ADO, with the effective implementation of the measures detailed above, ***no significant adverse residual effects*** *have been predicted in respect of commercial fisheries.*

9.14.22 A summary of the residual effect assessment is provided in Table 28.

Table 28 Summary of residual effect assessment for impact 6

Receptor	Magnitude	Sensitivity	Effect	Additional mitigation	Residual effect
Irish potting fleet (whelk)	Medium adverse	Medium	Moderate	Yes	Slight adverse
Irish potting fleet (crab & lobster)	Low adverse	Low	Slight adverse	N/A	Slight adverse
Scallop dredge fleet (Irish and UK)	Low adverse	Medium	Slight adverse	N/A	Slight adverse
Otter trawl fleet (Irish and UK)	Low adverse	Low	Slight adverse	N/A	Slight adverse
Beam trawl fleet (Irish, UK & Belgian)	Low adverse	Low	Slight adverse	N/A	Slight adverse
Mussel seed fishery (Irish)	Negligible	Negligible	Imperceptible	N/A	Imperceptible
Razor shell fishery (Irish)	Negligible	Negligible	Imperceptible	N/A	Imperceptible
Pelagic trawl fishery (Irish & UK)	Negligible	Negligible	Imperceptible	N/A	Imperceptible

Impact 7: Physical presence of Offshore ECC leading to reduction in access to, or exclusion from established fishing grounds

9.14.23 Temporary 500 m advisory safety passing distances recommended around vessels engaged in export cable repair works, could limit fishing opportunities within localised areas. In addition, cable protection across up to 20% length of the Offshore ECC could affect normal operations of fishing gears.

Magnitude of impact

9.14.24 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 NP 100 Mariners Handbook (UK Hydrographic Office, 2020) 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*". In this respect, 'vicinity' is considered to refer to the location of subsea cables as marked on admiralty charts.

9.14.25 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, 2019).

9.14.26 For the purposes of this assessment, the Applicant is committed to ensuring that fishermen will be well informed in a timely manner 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. The liaison principles and routes for promulgation of information are defined in the FMMS. Based on this knowledge, it is assumed that fishers 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.

9.14.27 Notices to Mariners will be issued in advance of any maintenance works. Potting vessels targeting whelk and /or crab and lobster may be required to temporarily relocate pots during maintenance works, although such works are likely to be infrequent. With sufficient notice, otter trawling and scallop dredging vessels are expected to be able to avoid maintenance works. Beam trawling, mussel seed, razor shell and pelagic fisheries are not expected to take place within the Offshore ECC.

9.14.28 The impact is predicted to be of very local spatial extent and of temporary 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 potting and **Negligible** for all other fleets.

Table 29 Determination of magnitude for impact 7

Receptor	Extent	Duration	Frequency	Probability	Consequence	Overall magnitude
Irish potting fleet (whelk)	Very local	Long term	Occasional	Likely	Minor	Low adverse
Irish potting fleet (crab & lobster)	Very local	Long term	Occasional	Likely	Minor	Low adverse
Scallop dredge fleet (Irish and UK)	Very local	Long term	Occasional	Likely	Minor	Negligible
Otter trawl fleet (Irish and UK)	Very local	Long term	Occasional	Likely	Slight	Negligible

Receptor	Extent	Duration	Frequency	Probability	Consequence	Overall magnitude
Beam trawl fleet (Irish, UK & Belgian)	Very local	Long term	Occasional	Likely	Slight	Negligible
Mussel seed fishery (Irish)	Negligible	Long term	Occasional	Likely	Negligible	Negligible
Razor shell fishery (Irish)	Negligible	Long term	Occasional	Likely	Negligible	Negligible
Pelagic trawl fishery (Irish & UK)	Negligible	Long term	Occasional	Likely	Negligible	Negligible

Sensitivity of receptors

9.14.29 All fleets are considered to have an operational range beyond that of the Offshore ECC. All fleets, except potting, are considered to have low levels of dependence on the Offshore ECC, be highly adaptable, with high recoverability and low value; the sensitivity of all other fleets is considered to be **Negligible**. The potting fleet, understood to be more active in inshore waters, are deemed to be of medium vulnerability, high recoverability and low value. The sensitivity of this receptor is considered to be **Low**.

Table 30 Determination of sensitivity for commercial fisheries to impact 7

Receptor	Context			Value	Overall sensitivity
	Adaptability	Tolerance	Recoverability		
Irish potting fleet (whelk)	Moderate levels of alternative grounds	Medium vulnerability	High recoverability	Medium value	Low
Irish potting fleet (crab & lobster)	Moderate levels of alternative grounds	Medium vulnerability	High recoverability	Low value	Low
Scallop dredge fleet (Irish and UK)	High levels of alternative grounds	Low vulnerability	High recoverability	Low value	Negligible
Otter trawl fleet (Irish and UK)	High levels of alternative grounds	Low vulnerability	High recoverability	Low value	Negligible
Beam trawl fleet (Irish, UK & Belgian)	High levels of alternative grounds	Low vulnerability	High recoverability	Low value	Negligible
Mussel seed fishery (Irish)	High levels of alternative ground	Low vulnerability	High recoverability	Low value	Negligible
Razor shell fishery (Irish)	High levels of alternative ground	Low vulnerability	High recoverability	Very low	Negligible
Pelagic trawl fishery (Irish & UK)	High levels of alternative areas	Low vulnerability	High recoverability	Very low	Negligible

Significance of effects

9.14.30 *Potting fishery*: Overall, it is predicted that the sensitivity of the receptor is **Low,** and the magnitude is **Low adverse**. The effect is **Slight adverse**, which is not significant in EIA terms.

Magnitude of impact

9.14.35 Given that potting can resume across the Offshore ECC and within the array area out with the physical presence of the sub-surface infrastructure and temporary safe passing distances during maintenance activities, the magnitude for Irish potters is considered to be **Low adverse**. The magnitude of impact of displacement during the operational and maintenance phase is expected to be the same or similar to that during construction for all other fleets.

9.14.36 The impact is predicted to be of local spatial extent, short term duration, intermittent and with high reversibility. It is predicted that the impact will affect the receptor directly. Based on the justifications above, the magnitude is therefore considered to be **Low adverse** for potting and **Negligible** for all other fleets.

Table 32 Determination of magnitude for impact 8

Receptor	Extent	Duration	Frequency	Probability	Consequence	Overall magnitude
Irish potting fleet (whelk)	Local	Short term	Occasional	Likely	Minor	Low adverse
Irish potting fleet (crab & lobster)	Local	Short term	Occasional	Likely	Minor	Low adverse
Scallop dredge fleet (Irish and UK)	Very local	Short term	Occasional	Likely	Slight	Negligible
Otter trawl fleet (Irish and UK)	Very local	Short term	Occasional	Likely	Slight	Negligible
Beam trawl fleet (Irish, UK & Belgian)	Very local	Short term	Occasional	Likely	Slight	Negligible
Mussel seed fishery (Irish)	Negligible	Short term	Occasional	Likely	Negligible	Negligible
Razor shell fishery (Irish)	Negligible	Short term	Occasional	Likely	Negligible	Negligible
Pelagic trawl fishery (Irish & UK)	Negligible	Short term	Occasional	Likely	Negligible	Negligible

Sensitivity of receptors

9.14.37 The sensitivity of the commercial fisheries receptors is the same as that presented for construction, summarised as **Medium** for the potting fleet, and **Low** to **Negligible** for all other fleets.

Table 33 Determination of sensitivity for commercial fisheries to impact 8

Receptor	Context			Value	Overall sensitivity
	Adaptability	Tolerance	Recoverability		
Irish potting fleet (whelk)	Low levels of alternative grounds	Medium vulnerability	Moderate recoverability	Medium-high value	Medium
Irish potting fleet (crab & lobster)	Moderate levels of alternative grounds	Medium vulnerability	Moderate recoverability	Medium value	Medium
Scallop dredge fleet (Irish and UK)	Moderate levels of alternative grounds	Low vulnerability	Moderate recoverability	Low value	Low
Otter trawl fleet (Irish and UK)	Moderate levels of alternative grounds	Low vulnerability	Moderate recoverability	Low value	Low
Beam trawl fleet (Irish, UK & Belgian)	Moderate levels of alternative grounds	Low vulnerability	Moderate recoverability	Low value	Low
Mussel seed fishery (Irish)	High levels of alternative ground	Low vulnerability	High recoverability	Low	Negligible
Razor shell fishery (Irish)	High levels of alternative ground	Low vulnerability	Moderate recoverability	Very low	Negligible
Pelagic trawl fishery (Irish & UK)	High levels of alternative areas	Low vulnerability	High recoverability	Very low	Negligible

Significance of effects

9.14.38 *Potting fishery*: Overall, it is predicted that the sensitivity of the receptor is **Medium,** and the magnitude is **Low adverse**. The effect is **Slight adverse**, which is not significant in EIA terms.

9.14.39 *All other fisheries*: Overall, it is predicted that the sensitivity of the receptor is **Low** to **Negligible,** and the magnitude is **Negligible**. The effect is **Imperceptible**, which is not significant in EIA terms.

9.14.40 The alternative design options (any other option within the range of parameters set out in the project description) will not give rise to an effect which is more significant than the maximum design option.

Residual effect assessment

9.14.41 A summary of the residual effect assessment is provided in Table 34.

The significance of effect is not significant in EIA terms. Therefore, no additional mitigation to that already identified in Table 9 are considered necessary. Therefore, ***no significant adverse residual effects*** *have been predicted in respect of commercial fisheries.*

Table 34 Summary of residual effect assessment for impact 8

Receptor	Magnitude	Sensitivity	Effect	Additional mitigation	Residual effect
Irish potting fleet (whelk)	Low adverse	Medium	Slight adverse	N/A	Slight adverse
Irish potting fleet (crab & lobster)	Low adverse	Medium	Slight adverse	N/A	Slight adverse
Scallop dredge fleet (Irish and UK)	Negligible	Low	Imperceptible	N/A	Imperceptible
Otter trawl fleet (Irish and UK)	Negligible	Low	Imperceptible	N/A	Imperceptible
Beam trawl fleet (Irish, UK & Belgian)	Negligible	Low	Imperceptible	N/A	Imperceptible
Mussel seed fishery (Irish)	Negligible	Negligible	Imperceptible	N/A	Imperceptible
Razor shell fishery (Irish)	Negligible	Negligible	Imperceptible	N/A	Imperceptible
Pelagic trawl fishery (Irish & UK)	Negligible	Negligible	Imperceptible	N/A	Imperceptible

Impact 9: Dublin Array operation and maintenance activities leading to displacement or disruption of commercially important fish and shellfish resources.

9.14.42 Detailed assessments of the following potential operation and maintenance impacts have been undertaken in the Fish and Shellfish Ecology Chapter:

- Temporary increase in SSC and sediment deposition during maintenance activities;
- Temporary damage and disturbance of the seabed during maintenance activities;
- Long-term and permanent loss of benthic habitat due to placement of subsea infrastructure;
- Reduction in water and sediment quality through the release of contaminated sediments and/or accidental contamination;
- Increase in hard substrate and structural complexity due to the placement of subsea infrastructure;
- Potential barriers to movement through the presence of seabed infrastructure and EMF from cables; and
- Changes to seabed habitats resulting from effects on local hydrodynamic and sediment transport processes.

9.14.43 The approach to this assessment follows that outlined for construction, with details of the fish and shellfish ecology assessment summarised in Table 35.

Table 35 Significance of effects of operational phase impacts on fish and shellfish ecology

Potential impact	Magnitude	Sensitivity	Significance of effect
Temporary increase in SSC and sediment deposition as a result of maintenance activities including repair of foundations and cables	Low adverse	Medium	Not significant
Temporary damage and disturbance of the seabed during maintenance activities including repair of foundations and cables	Low adverse	Medium	Not significant
Long-term and permanent loss of benthic habitat due to placement of subsea infrastructure	Low adverse	Medium	Slight adverse
Reduction in water and sediment quality through the release of contaminated sediments and/or accidental contamination	Negligible*	High	Not significant
Increase in hard substrate and structural complexity due to the placement of subsea infrastructure	Low adverse	Medium	Slight adverse
Potential barriers to movement through the presence of seabed infrastructure and EMF from cables	Low adverse	Low	Slight adverse
Changes to seabed habitats resulting from effects on local hydrodynamic and sediment transport processes	Negligible	Medium	Not significant

* The Fish and Shellfish Ecology Chapter concluded that given the fates of the plumes, the low concentrations of sediment-bound contaminants, and the very low likelihood of increased bio-availability of contaminants in the water column, the impact is not considered to result in any discernible change to fish and shellfish receptors from baseline conditions. Consequently, the magnitude of the impact is deemed to be Negligible.

9.14.44 The impact to commercial fishing fleets is predicted to be of local spatial extent, of relevance to national fishing fleets, and of long-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** to **Negligible** in relation to all potential impacts.

Table 36 Determination of magnitude for impact 9

Receptor	Extent	Duration	Frequency	Probability	Consequence	Overall magnitude
Irish potting fleet (whelk)	Local	Long term	Intermittent	Likely	Minor	Low adverse
Irish potting fleet (crab & lobster)	Local	Long term	Intermittent	Likely	Minor	Low adverse
Scallop dredge fleet (Irish and UK)	Local	Long term	Intermittent	Likely	Minor	Low adverse
Otter trawl fleet (Irish and UK)	Local	Long term	Intermittent	Likely	Slight	Low adverse
Beam trawl fleet (Irish, UK & Belgian)	Local	Long term	Intermittent	Likely	Slight	Low adverse

Receptor	Extent	Duration	Frequency	Probability	Consequence	Overall magnitude
Mussel seed fishery (Irish)	Negligible	Long term	Intermittent	Likely	Negligible	Negligible
Razor shell fishery (Irish)	Negligible	Long term	Intermittent	Likely	Negligible	Negligible
Pelagic trawl fishery (Irish & UK)	Negligible	Long term	Intermittent	Likely	Negligible	Negligible

Sensitivity of receptors

9.14.45 The fleets are deemed to be of low vulnerability, high recoverability and medium-low value. The sensitivity of the receptor for all fleets, except whelk potting, is therefore considered to be **Low** to **Negligible**. Based on the value of the whelk fishery, together with the relative mobility of the target species, coupled with concern raised by fishing industry stakeholder, the sensitivity is considered to be **Medium**.

Table 37 Determination of sensitivity for commercial fisheries to impact 9

Receptor	Context			Value	Overall sensitivity
	Adaptability	Tolerance	Recoverability		
Irish potting fleet (whelk)	Low levels of alternative grounds	Low-medium vulnerability	Moderate recoverability	Medium value	Medium
Irish potting fleet (crab & lobster)	Moderate levels of alternative grounds	Low vulnerability	Moderate recoverability	Low value	Low
Scallop dredge fleet (Irish and UK)	Moderate levels of alternative grounds	Low vulnerability	Moderate recoverability	Low value	Low
Otter trawl fleet (Irish and UK)	Moderate levels of alternative grounds	Low vulnerability	Moderate recoverability	Low value	Low
Beam trawl fleet (Irish, UK & Belgian)	Moderate levels of alternative grounds	Low vulnerability	Moderate recoverability	Low value	Low
Mussel seed fishery (Irish)	High levels of alternative ground	Low vulnerability	Moderate recoverability	Low	Negligible
Razor shell fishery (Irish)	High levels of alternative ground	Low vulnerability	Moderate recoverability	Very low	Negligible
Pelagic trawl fishery (Irish & UK)	High levels of alternative areas	Low vulnerability	Moderate recoverability	Very low	Negligible

Significance of effects

9.14.46 *Whelk potting fishery*: Overall, it is predicted that the sensitivity of the receptor is **Medium,** and the magnitude is **Low adverse**. The effect is **Slight adverse**, which is not significant in EIA terms.

9.14.47 *Crab and lobster potting fishery, scallop dredge, otter trawl and beam trawl fisheries*: Overall, it is predicted that the sensitivity of the receptor is **Low,** and the magnitude is **Low adverse**. The effect is **Slight adverse**, which is not significant in EIA terms.

9.14.48 *All other fisheries*: Overall, it is predicted that the sensitivity of the receptor is **Negligible,** and the magnitude is **Negligible**. The effect is **Imperceptible**, which is not significant in EIA terms.

9.14.49 The alternative design options (any other option within the range of parameters set out in the project description) will not give rise to an effect which is more significant than the maximum design option.

Residual effect assessment

9.14.50 A summary of the residual effect assessment is provided in Table 38.

The significance of effect is not significant in EIA terms. Therefore, no additional mitigation to that already identified in Table 9 are considered necessary. Therefore, ***no significant adverse residual effects*** *have been predicted in respect of commercial fisheries.*

Table 38 Summary of residual effect assessment for impact 9

Receptor	Magnitude	Sensitivity	Effect	Additional mitigation	Residual effect
Irish potting fleet (whelk)	Low adverse	Medium	Slight adverse	N/A	Slight adverse
Irish potting fleet (crab & lobster)	Low adverse	Low	Slight adverse	N/A	Slight adverse
Scallop dredge fleet (Irish and UK)	Low adverse	Low	Slight adverse	N/A	Slight adverse
Otter trawl fleet (Irish and UK)	Low adverse	Low	Slight adverse	N/A	Slight adverse
Beam trawl fleet (Irish, UK & Belgian)	Low adverse	Low	Slight adverse	N/A	Slight adverse
Mussel seed fishery (Irish)	Negligible	Negligible	Imperceptible	N/A	Imperceptible
Razor shell fishery (Irish)	Negligible	Negligible	Imperceptible	N/A	Imperceptible
Pelagic trawl fishery (Irish & UK)	Negligible	Negligible	Imperceptible	N/A	Imperceptible

Impact 10: Increased vessel traffic within fishing grounds as a result of changes to shipping routes and maintenance vessel traffic from Dublin Array leading to interference with fishing activity

9.14.51 The effects of the operational and maintenance phase are expected to be the same or similar to the effects from construction. The significance of effect is therefore **Slight adverse** for potting fisheries and **Imperceptible** for all other fleets, which is not significant in EIA terms.

9.14.52 The alternative design options (any other option within the range of parameters set out in the project description) will not give rise to an effect which is more significant than the maximum design option.

Residual effect assessment

9.14.53 A summary of the residual effect assessment is provided in Table 39.

The significance of effect is not significant in EIA terms. Therefore, no additional mitigation to that already identified in Table 9 are considered necessary. Therefore, ***no significant adverse residual effects*** *have been predicted in respect of commercial fisheries.*

Table 39 Summary of residual effect assessment for impact 10

Receptor	Magnitude	Sensitivity	Effect	Additional mitigation	Residual effect
Irish potting fleet (whelk)	Low adverse	Medium	Slight adverse	N/A	Slight adverse
Irish potting fleet (crab & lobster)	Low adverse	Medium	Slight adverse	N/A	Slight adverse
Scallop dredge fleet (Irish and UK)	Low adverse	Negligible	Imperceptible	N/A	Imperceptible
Otter trawl fleet (Irish and UK)	Low adverse	Negligible	Imperceptible	N/A	Imperceptible
Beam trawl fleet (Irish, UK & Belgian)	Low adverse	Negligible	Imperceptible	N/A	Imperceptible
Mussel seed fishery (Irish)	Negligible	Negligible	Imperceptible	N/A	Imperceptible
Razor shell fishery (Irish)	Negligible	Negligible	Imperceptible	N/A	Imperceptible
Pelagic trawl fishery (Irish & UK)	Negligible	Negligible	Imperceptible	N/A	Imperceptible

Impact 11: Physical presence of Dublin Array infrastructure leading to gear snagging.

9.14.54 The inter-array cables and offshore 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 are assessed within the Shipping and Navigation Chapter.

9.14.55 In the instance that snagging does occur, the Applicant will work to the standard industry protocols for dealing with claims for loss or damage of gear as defined in the FMMS. This includes incident claims and a lost or damaged gear procedure.

Magnitude of impact

9.14.56 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. The navigational safety aspects are assessed within the Shipping and Navigation Chapter.

9.14.57 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 array area and ECC.

9.14.58 Evidence exists of fishing resuming within operational wind farms, including potting fisheries targeting lobster within the Westermost Rough Offshore Wind Farm (Roach *et al.,* 2018 and Roach *et al.,* 2022).

9.14.59 The impact is predicted to be of local spatial extent, long term duration, continuous and with low reversibility. It is predicted that the impact will affect the receptor directly. Based on the measures that will be implemented as part of Dublin Array and the commitment to follow standard protocols should snagging occur, the magnitude is considered to be **Low adverse** to **Negligible** for all fleets.

Table 40 Determination of magnitude for impact 11

Receptor	Extent	Duration	Frequency	Probability	Consequence	Overall magnitude
Irish potting fleet (whelk)	Local	Long term	Continuous	Unlikely	Minor	Low adverse
Irish potting fleet (crab & lobster)	Local	Long term	Continuous	Unlikely	Minor	Low adverse
Scallop dredge fleet (Irish and UK)	Local	Long term	Continuous	Unlikely	Minor	Low adverse
Otter trawl fleet (Irish and UK)	Local	Long term	Continuous	Unlikely	Minor	Low adverse
Beam trawl fleet (Irish, UK & Belgian)	Local	Long term	Continuous	Unlikely	Minor	Low adverse
Mussel seed fishery (Irish)	Negligible	Long term	Continuous	Unlikely	Negligible	Negligible
Razor shell fishery (Irish)	Negligible	Long term	Continuous	Unlikely	Negligible	Negligible
Pelagic trawl fishery (Irish & UK)	Negligible	Long term	Continuous	Unlikely	Negligible	Negligible

Sensitivity of receptors

9.14.60 Due to the nature and operation of mobile gear (i.e. actively towed and dredge, otter trawl and beam trawl gear which 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.

9.14.61 Potters show a low vulnerability as the gear is placed, not towed and is less likely to penetrate the seabed. The sensitivity of potters is considered to be **Low**.

Table 41 Determination of sensitivity for commercial fisheries to impact 11

Receptor	Context			Value	Overall sensitivity
	Adaptability	Tolerance	Recoverability		
Irish potting fleet (whelk)	Low levels of alternative grounds	Low vulnerability	Moderate recoverability	High value	Low
Irish potting fleet (crab & lobster)	Moderate levels of alternative grounds	Low vulnerability	Moderate recoverability	Low value	Low
Scallop dredge fleet (Irish and UK)	Moderate levels of alternative grounds	Medium vulnerability	Moderate recoverability	Medium value	Medium
Otter trawl fleet (Irish and UK)	Moderate levels of alternative grounds	Medium vulnerability	Moderate recoverability	Low value	Medium
Beam trawl fleet (Irish, UK & Belgian)	Moderate levels of alternative grounds	Medium vulnerability	Moderate recoverability	Low value	Medium
Mussel seed fishery (Irish)	High levels of alternative ground	Low vulnerability	Moderate recoverability	Low	Negligible
Razor shell fishery (Irish)	High levels of alternative ground	Low vulnerability	Moderate recoverability	Very low	Negligible
Pelagic trawl fishery (Irish & UK)	High levels of alternative areas	Low vulnerability	Moderate recoverability	Very low	Negligible

Significance of effects

9.14.62 *Potting fisheries*: Overall, it is predicted that the sensitivity of the receptor is **Low,** and the magnitude is **Low adverse**. The effect is **Slight adverse**, which is not significant in EIA terms.

9.14.63 *Scallop dredge, otter trawl and beam trawl fisheries*: Overall, it is predicted that the sensitivity of the receptor is **Medium,** and the magnitude is **Low adverse**. The effect is **Slight adverse**, which is not significant in EIA terms.

9.14.64 *All other fisheries*: Overall, it is predicted that the sensitivity of the receptor is **Negligible,** and the magnitude is **Negligible**. The effect is **Imperceptible**, which is not significant in EIA terms.

9.14.65 The alternative design options (any other option within the range of parameters set out in the project description) will not give rise to an effect which is more significant than the maximum design option.

Residual effect assessment

9.14.66 A summary of the residual effect assessment is provided in Table 42.

The significance of effect is not significant in EIA terms. Therefore, no additional mitigation to that already identified in Table 9 are considered necessary. Therefore, ***no significant adverse residual effects*** *have been predicted in respect of commercial fisheries.*

Table 42 Summary of residual effect assessment for impact 11

Receptor	Magnitude	Sensitivity	Effect	Additional mitigation	Residual effect
Irish potting fleet (whelk)	Low adverse	Low	Slight adverse	N/A	Slight adverse
Irish potting fleet (crab & lobster)	Low adverse	Low	Slight adverse	N/A	Slight adverse
Scallop dredge fleet (Irish and UK)	Low adverse	Medium	Slight adverse	N/A	Slight adverse
Otter trawl fleet (Irish and UK)	Low adverse	Medium	Slight adverse	N/A	Slight adverse
Beam trawl fleet (Irish, UK & Belgian)	Low adverse	Medium	Slight adverse	N/A	Slight adverse
Mussel seed fishery (Irish)	Negligible	Negligible	Imperceptible	N/A	Imperceptible
Razor shell fishery (Irish)	Negligible	Negligible	Imperceptible	N/A	Imperceptible
Pelagic trawl fishery (Irish & UK)	Negligible	Negligible	Imperceptible	N/A	Imperceptible

9.15 Environmental assessment: decommissioning phase

9.15.1 As referenced in the Project Description Chapter, the Decommissioning and Restoration Plan (Volume 7, Appendix 2), including the three rehabilitation schedules attached thereto, describes how the Applicant proposes to rehabilitate that part of the maritime area, and any other part of the maritime area, adversely affected by the permitted maritime usages that are the subject of the MACs (Reference Nos. 2022-MAC-003 and 004 / 20230012 and 240020).

9.15.2 It is based on the best scientific and technical knowledge available at the time of submission of this planning application. However, the lengthy passage of time between submission of the planning application and the carrying out of decommissioning works (expected to be in the region of 35 years as defined in the MDO) gives rise to knowledge limitations and technical difficulties. Accordingly, the Decommissioning and Restoration Plan will be kept under review by the Applicant as the project progresses, and an alteration application will be submitted if necessary. In particular, it will be reviewed having regard to the following:

- The baseline environment at the time rehabilitation works are proposed to be carried out;
- What, if any, adverse effects have occurred that require rehabilitation;
- Technological developments relating to the rehabilitation of marine environments;
- Changes in what is accepted as best practice relating to the rehabilitation of marine environments;
- Submissions or recommendations made to the Applicant by interested parties, organisations and other bodies concerned with the rehabilitation of marine environments; and/or
- Any new relevant regulatory requirements.

9.15.3 The Decommissioning and Restoration Plan outlines the process for decommissioning of the WTG, foundations, scour protection, OSP, inter array cables and Offshore ECC. The plan outlines the assumption that the most practicable environmental option is to leave certain structures in situ. All surface structures to be removed and it is assumed that the wind turbine generators (WTG's) will be dismantled and completely removed to shore. Piled foundations will be cut at a level below the seabed, buried cables and scour and cable protection left in situ.

9.15.4 The decommissioning phase includes the following potential impacts to commercial fisheries:

- Impact 12: Array area decommissioning activities leading to reduction in access to, or exclusion from, potential and/or established fishing grounds;
- Impact 13: Offshore ECC decommissioning activities leading to reduction in access to, or exclusion from established fishing grounds;
- Impact 14: Displacement from the array area and Offshore ECC leading to gear conflict and increased fishing pressure on adjacent grounds;
- Impact 15: Decommissioning activities leading to displacement or disruption of commercially important fish and shellfish resources;
- Impact 16: Increased vessel traffic within fishing grounds as a result of changes to shipping routes and transiting decommissioning vessel traffic from Dublin Array leading to interference with fishing activity; and
- Impact 17: Physical presence of any infrastructure left in situ leading to gear snagging.

9.15.5 The environmental impacts arising from the decommissioning of Dublin Array are listed in Table 8, along with the maximum design option against which each decommissioning phase impact has been assessed.

Impact 12: Array area decommissioning activities leading to reduction in access to, or exclusion from, potential and/or established fishing grounds

9.15.6 The magnitude of the impact of array area decommissioning activities leading to reduction in access is expected to be the same, or similar, to that described for construction in paragraphs 9.13.4 to 9.13.14 and summarised as **Medium** for whelk potting; **Low** for crab and lobster potting, scallop dredge, otter trawl and beam trawl fisheries; and **Negligible** for all other fisheries.

9.15.7 The sensitivity of the receptors is as described for construction in paragraphs 9.13.15 to 9.13.19, summarised as **Medium** for whelk potting and scallop dredge; **Low** for crab and lobster potting, otter trawl and beam trawl fisheries; and **Negligible** for all other fisheries.

Significance of effects

9.15.8 *Whelk potting fishery*: Overall, it is predicted that the sensitivity of the receptor is **Medium,** and the magnitude is **Medium adverse**. The effect is **Moderate adverse**, which is considered to be significant in EIA terms due to the high dependence of the local fleet on the whelk grounds that overlap the array area. The Applicant is committed to delivering further mitigation as described below.

9.15.9 *Crab and lobster potting fishery*: Overall, it is predicted that the sensitivity of the receptor is **Low,** and the magnitude is **Low adverse**. The effect is **Slight adverse**, which is not significant in EIA terms.

9.15.10 *Dredge fishery*: Overall, it is predicted that the sensitivity of the receptor is **Medium,** and the magnitude is **Low adverse**. The effect is **Slight adverse**, which is not significant in EIA terms.

9.15.11 *Otter and beam trawl fishery*: Overall, it is predicted that the sensitivity of the receptor is **Low,** and the magnitude is **Low adverse**. The effect is **Slight adverse**, which is not significant in EIA terms.

9.15.12 *All other fisheries*: Overall, it is predicted that the sensitivity of the receptor is **Negligible,** and the magnitude is **Negligible**. The effect is **Imperceptible**, which is not significant in EIA terms.

9.15.13 The alternative design options (any other option within the range of parameters set out in the project description) will not give rise to an effect which is more significant than the maximum design option.

Proposed mitigation

9.15.14 The Applicant is committed to maintaining a FMMS throughout the decommissioning phase. The proposed mitigation is as described for construction in paragraphs 9.13.26 to 9.13.33.

Residual effect assessment

In relation to both MDO and ADO, with the effective implementation of the measures detailed above, ***no significant adverse residual effects*** *have been predicted in respect of commercial fisheries.*

Impact 13: Offshore ECC decommissioning activities leading to reduction in access to, or exclusion from established fishing grounds

9.15.15 The magnitude of the impact of offshore ECC decommissioning activities leading to reduction in access is expected to be the same, or similar, to that described for construction in paragraphs 9.13.34 to 9.13.41 and summarised as **Medium** for whelk potting and crab and lobster potting; and **Low** for scallop dredge and otter trawl; and **Negligible** for all other fisheries.

9.15.16 The sensitivity of the receptors is as described for construction in paragraphs 9.13.42 to 9.13.47, summarised as **Medium** for whelk potting and scallop dredge; **Low** for crab and lobster potting, otter trawl and beam trawl fisheries; and **Negligible** for all other fisheries.

Significance of effects

9.15.17 *Whelk potting fishery*: Overall, it is predicted that the sensitivity of the receptor is **Medium,** and the magnitude is **Medium adverse**. The effect is **Moderate adverse**, which is significant in EIA terms. Further mitigation is therefore proposed below.

9.15.18 *Crab and lobster potting fishery*: Overall, it is predicted that the sensitivity of the receptor is **Medium,** and the magnitude is **Medium adverse**. The effect is **Moderate adverse**, which is significant in EIA terms. Further mitigation is therefore proposed below.

9.15.19 *Dredge fishery*: Overall, it is predicted that the sensitivity of the receptor is **Low,** and the magnitude is **Low adverse**. The effect is **Slight adverse**, which is not significant in EIA terms.

9.15.20 *Otter trawl fishery*: Overall, it is predicted that the sensitivity of the receptor is **Low,** and the magnitude is **Low adverse**. The effect is **Slight adverse**, which is not significant in EIA terms.

9.15.21 *Beam trawl fishery*: Overall, it is predicted that the sensitivity of the receptor is **Low,** and the magnitude is **Negligible**. The effect is **Not significant**, which is not significant in EIA terms.

9.15.22 *All other fisheries*: Overall, it is predicted that the sensitivity of the receptor is **Negligible,** and the magnitude is **Negligible**. The effect is **Imperceptible**, which is not significant in EIA terms.

9.15.23 The alternative design options (any other option within the range of parameters set out in the project description) will not give rise to an effect which is more significant than the maximum design option.

Proposed mitigation

9.15.24 The Applicant is committed to maintaining a FMMS throughout the decommissioning phase. The proposed mitigation is as described for construction in paragraphs 9.13.26 to 9.13.33.

Residual effect assessment

In relation to both MDO and ADO, with the effective implementation of the measures detailed above, ***no significant adverse residual effects*** *have been predicted in respect of commercial fisheries.*

Impact 14: Displacement from the array area and Offshore ECC leading to gear conflict and increased fishing pressure on adjacent grounds

9.15.25 The magnitude of the impact of array area and offshore ECC decommissioning activities leading to displacement of fishing vessels is expected to be the same, or similar, to that described for construction in paragraphs 9.13.62 to 9.13.66 and summarised as **Low** for whelk potting, crab and lobster potting, scallop dredge, otter and beam trawl; and **Negligible** for all other fisheries.

9.15.26 The sensitivity of the receptors is as described for construction in paragraphs 9.13.67 to 9.13.69, summarised as **Medium** for whelk potting and crab and lobster potting; **Low** for scallop dredge otter trawl and beam trawl fisheries; and **Negligible** for all other fisheries.

Significance of effects

9.15.27 *Potting fisheries*: Overall, it is predicted that the sensitivity of the receptor is **Medium,** and the magnitude is **Low adverse**. The effect is **Slight adverse**, which is not significant in EIA terms.

9.15.28 *Dredge, otter trawl and beam trawl fisheries*: Overall, it is predicted that the sensitivity of the receptor is **Low,** and the magnitude is **Low adverse**. The effect is **Slight adverse**, which is not significant in EIA terms.

9.15.29 *All other fisheries*: Overall, it is predicted that the sensitivity of the receptor is **Negligible,** and the magnitude is **Negligible**. The effect is **Imperceptible**, which is not significant in EIA terms.

9.15.30 The alternative design options (any other option within the range of parameters set out in the project description) will not give rise to an effect which is more significant than the maximum design option.

Impact 15: Decommissioning activities leading to displacement or disruption of commercially important fish and shellfish resources

9.15.31 The magnitude of the impact of array area decommissioning activities leading to displacement of commercial resource is expected to be the same, or similar, to that described for construction in paragraphs 9.13.77 to 9.13.79 and summarised as **Low** for whelk potting, crab and lobster potting, scallop dredge, otter and beam trawl; and **Negligible** for all other fisheries.

9.15.32 The sensitivity of the receptors is as described for construction in paragraphs 9.13.80 to 9.13.81 summarised as **Medium** for whelk potting, crab and lobster potting and scallop dredge; **Low** for otter trawl and beam trawl fisheries; and **Negligible** for all other fisheries.

Significance of effects

9.15.33 *Potting and dredge fisheries*: Overall, it is predicted that the sensitivity of the receptor is **Medium,** and the magnitude is **Low adverse**. The effect is **Slight adverse**, which is not significant in EIA terms.

9.15.34 *Otter trawl and beam trawl fisheries*: Overall, it is predicted that the sensitivity of the receptor is **Low,** and the magnitude is **Low adverse**. The effect is **Slight adverse**, which is not significant in EIA terms.

9.15.35 *All other fisheries*: Overall, it is predicted that the sensitivity of the receptor is **Negligible,** and the magnitude is **Negligible**. The effect is **Imperceptible**, which is not significant in EIA terms.

9.15.36 The alternative design options (any other option within the range of parameters set out in the project description) will not give rise to an effect which is more significant than the maximum design option.

Impact 16: Increased vessel traffic within fishing grounds as a result of changes to shipping routes and transiting decommissioning vessel traffic from Dublin Array leading to interference with fishing activity

9.15.37 The magnitude of the impact of increased vessel traffic due to decommissioning activities leading to interference of fishing activity is expected to be the same, or similar, to that described for construction in paragraph 9.13.90 and summarised as **Low** for whelk potting, crab and lobster potting, scallop dredge, otter and beam trawl; and **Negligible** for all other fisheries.

9.15.38 The sensitivity of the receptors is as described for construction in paragraphs 9.13.91 to 9.13.92 summarised as **Medium** for whelk potting and crab and lobster potting; and **Negligible** for all other fisheries.

Significance of effects

9.15.39 *Potting fisheries*: Overall, it is predicted that the sensitivity of the receptor is **Medium,** and the magnitude is **Low adverse**. The effect is **Slight adverse**, which is not significant in EIA terms.

9.15.40 *Scallop dredge, otter trawl and beam trawl fisheries*: Overall, it is predicted that the sensitivity of the receptor is **Negligible,** and the magnitude is **Low**. The effect is **Imperceptible**, which is not significant in EIA terms.

9.15.41 *All other fisheries*: Overall, it is predicted that the sensitivity of the receptor is **Negligible,** and the magnitude is **Negligible**. The effect is **Imperceptible**, which is not significant in EIA terms.

9.15.42 The alternative design options (any other option within the range of parameters set out in the project description) will not give rise to an effect which is more significant than the maximum design option.

Impact 17: Physical presence of any infrastructure left in situ leading to gear snagging

9.15.43 The magnitude of the impact of decommissioning activities leading to gear snagging is expected to be the same, or similar, to that described for operation and maintenance in paragraphs 9.14.56 to 9.14.59 summarised as **Medium** for scallop dredge, otter and beam trawl fisheries; **Low** for whelk potting, crab and lobster potting; and **Negligible** for all other fisheries.

9.15.44 The sensitivity of the receptors is as described for construction in paragraphs 9.14.60 to 9.14.61 summarised as **Medium** for whelk potting and crab and lobster potting; and **Negligible** for all other fisheries.

Significance of effects

9.15.45 *Potting fisheries*: Overall, it is predicted that the sensitivity of the receptor is **Low,** and the magnitude is **Low adverse**. The effect is **Slight adverse**, which is not significant in EIA terms.

9.15.46 *Scallop dredge, otter trawl and beam trawl fisheries*: Overall, it is predicted that the sensitivity of the receptor is **Medium,** and the magnitude is **Low adverse**. The effect is **Slight adverse**, which is not significant in EIA terms.

9.15.47 *All other fisheries*: Overall, it is predicted that the sensitivity of the receptor is **Negligible,** and the magnitude is **Negligible**. The effect is **Imperceptible**, which is not significant in EIA terms.

9.15.48 The alternative design options (any other option within the range of parameters set out in the project description) will not give rise to an effect which is more significant than the maximum design option.

9.16 Environmental assessment: cumulative effects

Overview and guidance

9.16.1 This section outlines the cumulative effect assessment on commercial fisheries and takes in account the impacts of the proposed development alone, together with other plans and projects. As outlined in Volume 2, Chapter 4: Cumulative Effects Assessment Methodology Chapter (hereafter referred to as the Cumulative Effects Assessment Methodology Chapter), the screening process involved determination of appropriate search areas for projects, plans and activities and Zones of Influence (ZoIs) for potential cumulative effects. These were then screened according to the level of detail publicly available and the potential for interactions with regard to the presence of an impact pathway as well as spatial and temporal overlap.

9.16.2 The CEA long list of projects, plans and activities with which Dublin Array's offshore infrastructure has the potential to interact with to produce a cumulative impact is presented within the Cumulative Effects Assessment Methodology Chapter (Volume 2, Chapter 4, Annex A: Offshore Long-list). Each plan and project has been considered on case by case basis with the maximum suite of projects identified from a long list within a search area defined as the ICES Ecoregion subsection Division 7a of the Celtic Sea ICES Ecoregion [9] is considered appropriate for this exercise in relation to commercial fisheries receptors as this is considered to encapsulate the reasonable range of fishing grounds targeted by international fleets that operate within the commercial fisheries local and regional study area.

9.16.3 The specific projects scoped into this cumulative impact assessment on commercial fisheries receptors, and the tiers into which they have been allocated are presented in Table 43.

9.16.4 The full list of plans and projects considered, including those screened out, are presented in Volume 2 Chapter 4 Annex A Offshore long-list. For the purposes of the cumulative impact assessment, a precautionary construction period has been assumed between the years 2029 to 2032, with offshore construction (excluding preparation works) lasting up 30 months as a continuous phase within this period (refer to the Project Description Chapter). After construction, Dublin Array will be operational for 35 years.

[9] Ecoregions are used to provide regional advice, steer regional integrated approaches and are the primary geographical units for ICES to develop science, new techniques and monitoring programmes. They provide the broad-scale spatial framework for the knowledge base to address management challenges and monitor the changing ecology of the North-East Atlantic. Division 7a is part of the Celtic Sea Ecoregion and broadly covers the Irish Sea.

Table 43 Projects for cumulative assessment

Development type	Project name	Current status of development	Data confidence assessment / phase	Planned programme
Tier 1				
Offshore Wind Farm	GE Energy Arklow Bank	Consented	High – Operational. Initial foreshore license granted in 2002.	Construction Pre-2024, currently operational.
Tier 2				
Other Offshore Energy	Minesto UK Limited Holyhead Deep	Consented	High – Consented and EIA Report available at time of writing.	Construction activities scheduled to take place 2026-2029; Tidal energy development scheduled to be in operation from 2030.
Offshore Wind Farm	RWE Renewables Awel y Môr	Consented	High – Consented and EIA Report available at time of writing.	Construction activities scheduled to take place 2026-2030.
Tier 3				
Subsea cables	Mares Connect	Proposed	Low – Proposed.	Power cable; construction 2024-2027.
Offshore Wind Farm	EnBW and BP Mona	Pre-consent; Application submitted	High - Scoping and EIA Report available at time of writing.	Construction activities scheduled to take place 2028-2029.
Offshore Wind Farm	EnBW and BP Morgan	Pre-consent; Application submitted	High - Scoping and EIA Report available at time of writing.	Construction activities scheduled to take place 2028-2029.
Offshore Wind Farm	Ørsted Mooir Vannin, Isle of Man	Pre-consent	Medium - Scoping Report available at the time of writing.	Construction activities scheduled to take place 2024-2029.
Offshore Wind Farm	Cobra & Flotation Energy Morecambe	Pre-consent; Application submitted	High - Scoping and EIA Report available at time of writing.	Construction activities scheduled to take place 2026-2028.

Development type	Project name	Current status of development	Data confidence assessment / phase	Planned programme
Offshore Wind Farm	North Channel Wind 2	Pre-consent	Medium - Scoping Report available at the time of writing.	Construction activities scheduled to take place 2029-2030.
Offshore Wind Farm	North Channel Wind 1	Pre-consent	Medium - Scoping Report available at the time of writing.	Construction activities scheduled to take place 2029-2030.
Future Plans and Programmes	Minister for Housing, Planning and Local Government, Application by Dublin Port Company	Pre-consent	Low – Proposed.	
Future Plans and Programmes	MARA South Coast Renewable Energy DMAP (Ireland)	Pre-consent	Low - Proposed. 700 MW and 900 MW of offshore wind capacity - anticipated to be ONE project.	Delivery by 2030 but construction timescales unknown
Future Plans and Programmes	Planning Inspectorate Celtic Sea (UK Round 5)	Pre-consent	Low - Proposed. 4.5GW made up of 3 Project Development Areas (located within one 'zone').	AfLs to be signed in autumn 2025. Construction timeline unknown.
Offshore Wind Farm	Statkraft North Irish Sea Array (NISA)	Pre-consent; Application submitted	High - Phase 1 (MAC awarded) Pre-consent Scoping report and EIA available (EIA submitted Q2 2024) Initial foreshore licence granted 2021. Site investigations have been undertaken.	Construction 2027-2028; Up to 46 WTGs, two export cables and one OSP are planned.
Offshore Wind Farm	SSE Renewables Arklow Bank Phase 2	Pre-consent; Application submitted	High - Phase 1 (MAC awarded) Pre-consent Scoping report and EIA available (EIA submitted Q2 2024) Foreshore licence granted for site investigations (2022-2027).	Construction 2027-2029; Between 36 and 60 WTGs, two export cables and one or two OSPs identified as the offshore design parameters.

Development type	Project name	Current status of development	Data confidence assessment / phase	Planned programme
			Reference FS007339. Site investigations have been undertaken.	
Offshore Wind Farm	Fred. Olsen Seawind, EDF Energies Codling Wind Park	Pre-consent; Application submitted	High - Phase 1 (MAC awarded) Pre-consent Scoping report and EIA available (EIA submitted Q2 2024) A foreshore licence (reference FS007045) has been granted for site investigation works from 2021-2026.	Commencement in 2027 with construction lasting 2-3 years.
Offshore Wind Farm	Oriel Wind farm Limited, Parkwind	Pre-consent; Application submitted	High - Phase 1 (MAC awarded) Pre-consent Scoping report and EIA available (EIA submitted Q2 2024) Foreshore license application reference FS007383 determined 2023.	Construction activities scheduled to take place 2026-2028.

9.16.5 Certain impacts assessed for Dublin Array 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 boundary only);
- Avoidance and preventative measures in place for Dublin Array (Section 9.12) are proposed on other projects reducing their risk of occurring; and/or
- Where the potential significance of the impact from Dublin Array alone has been assessed as negligible.

9.16.6 The impacts excluded from the CEA for the above reasons are:

- Displacement or disruption of commercially important fish and shellfish resources;
- Increased risk of gear snagging;
- 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 be fished within the Dublin Array area.

9.16.7 Therefore, the impacts that are considered in the CEA 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.

9.16.8 A description of the significance of cumulative effects upon commercial fisheries arising from each identified impact is given below.

Effect 18: Reduction in access to, or exclusion from established fishing grounds

Tier 1

9.16.9 Arklow Phase 1 offshore wind farm was constructed in 2003-2004, is currently operational and consists of seven turbines. Whilst this project is operational, it is identified that potential ongoing impacts could occur to the fishing industry. However, fishers are not prohibited from fishing within the Arklow Phase 1 site and are expected to have adapted to its presence since installation.

9.16.10 Therefore, the significance of effect from the reduced access, or exclusion from established grounds from the installation of Dublin Array cumulatively with the Tier 1 project is no higher than the residual effect of Dublin Array in isolation, i.e., **Slight adverse** for Irish whelk, crab and lobster potters, scallop dredgers, demersal otter trawl and beam trawl fleets and **Imperceptible** for all other fleets, which is not significant in EIA terms.

Tier 2

9.16.11 The Tier 2 assessment includes two additional offshore energy projects: Holyhead Deep and Awel y Môr Offshore Wind Farm (both located off the north Welsh coast approximately 130 km away from Dublin Array).

9.16.12 Based on the location of Tier 2 projects, the magnitude of impact and sensitivity of receptors is considered to be no more than that assessed for Tier 1 impacts for all fishing fleets.

9.16.13 Therefore, the significance of effect from the reduced access, or exclusion from established grounds from the installation of Dublin Array cumulatively with the Tier 2 projects is no higher than the residual effect of Dublin Array in isolation, i.e., **Slight adverse** for Irish whelk, crab and lobster potters, scallop dredgers, demersal otter trawl and beam trawl fleets and **Imperceptible** for all other fleets, which is not significant in EIA terms.

Tier 3

9.16.14 Dublin Array is located within established whelk grounds targeted by Irish potting vessels. Concern has been raised during consultation with the commercial fishing industry related to cumulative effects of the Phase 1 developments, specifically noting the close proximity of Codling Wind Park (approx. 2.5 km from Dublin Array) and therefore feasibly targeted by the same vessels.

9.16.15 For NISA and Arklow Bank Phase 2, significant effects (pre-mitigation) were identified for various commercial fisheries receptors active across these sites; notably demersal otter trawl targeting nephrops within the NISA array area and potters targeting whelk across the Arklow Bank Phase 2 export cable corridor. Mitigation packages have been proposed for both NISA and Arklow Bank Phase 2 in the form a series of measures and commitments within respective project FMMSs, which lower the residual impact to be not significant in EIA terms. Overall, effective implementation of project-level mitigation will minimise the cumulative impact across multiple Tier 1 projects during the construction, operational and decommissioning phases.

9.16.16 The impact assessment results for loss of access to commercial fisheries due to Codling Wind Park, Arklow Phase 2, NISA and Oriel are summarised in Table 44, including proposed additional mitigation where relevant.

9.16.17 Overall, it is assumed that where significant impacts occur, these will be appropriately mitigated at a Project level, and therefore the magnitude of impact and sensitivity of receptors is considered to be no more than that assessed for Tier 1 impacts for all fishing fleets.

9.16.18 Therefore, the significance of effect from the reduced access, or exclusion from established grounds from the installation of Dublin Array cumulatively with the Phase 1 projects is no higher than the residual effect of Dublin Array in isolation, i.e., **Slight adverse** for Irish whelk, crab and lobster potters, scallop dredgers, demersal otter trawl and beam trawl fleets and **Imperceptible** for all other fleets, which is not significant in EIA terms.

9.16.19 There is limited overlap of the receptors active within Dublin Array and other Tier 3 projects identified in Table 43, namely Mona, Morgan and Morecambe Offshore Windfarms. Key fisheries operating within Mona and Morgan are king and queen scallop fisheries, and within Morecambe are whelk potting fisheries. As evidenced by VMS data, there is limited overlap of Irish fisheries with these sites, although there may be occasional dredge and beam trawl activity. Overall, the significance of effect from the reduced access, or exclusion from established grounds from the installation of Dublin Array cumulatively with the remaining Tier 3 projects is no higher than the residual effect of Dublin Array in isolation, i.e., Slight adverse for Irish whelk, crab and lobster potters, scallop dredgers, demersal otter trawl and beam trawl fleets and Imperceptible for all other fleets, which is not significant in EIA terms.

Table 44 Summary of commercial fisheries impact assessment findings for Phase 1 offshore wind farms included in the cumulative assessment.

Project	Capacity	Loss of grounds or restricted access to fishing grounds	
		Array Area	OECC
Codling Wind Park	1,300 MW; 75 or 60 WTGs with fixed foundations; Array site area of 125 km^2	Minor adverse /negligible for all fleets during all phases, except: Moderate adverse for potters targeting whelk during all phases. Additional mitigation: FMMS; justifiable evidence-based disruption agreements; monitoring of catch per unit effort; gear trials	Minor adverse /negligible for all fleets during all phases, except: Moderate adverse for potters targeting whelk and crab and lobster during construction and decommissioning. Additional mitigation: FMMS; justifiable evidence-based disruption agreements.
Arklow Bank Phase 2	800 MW; 56 or 47 WTGs with fixed foundations; Array site area of 63 km^2	Slight adverse / not significant for all fleets during all phases.	Slight adverse / not significant for all fleets during all phases, except: Moderate adverse for potters targeting whelk and crab and lobster during construction and decommissioning. Additional mitigation: Cooperation agreements and associated payments.
North Irish Sea Array	500 MW; 49 or 35 WTGs with fixed foundations; Array site area of 88.5 km^2	Slight adverse for all fleets during all phases, except: Very significant for Irish demersal otter trawlers during construction and decommissioning and significant during operation; and Moderate for UK demersal otter trawlers during all phases. Additional mitigation: FMMS including Sustainable Fisheries Community.	Slight adverse for all fleets during all phases, except: Significant for Irish demersal otter trawlers, potting and razor dredgers during construction; and Moderate for UK demersal otter trawlers during construction. Additional mitigation: FMMS including Sustainable Fisheries Community.
Oriel	375 MW; 25 WTGs with fixed foundations; Array site area of 27.7 km^2	Slight adverse for all fleets during all phases	Slight adverse for all fleets during all phases

Effect 19: Displacement leading to gear conflict and increased fishing pressure on established fishing grounds

Tier 1

9.16.20 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).

9.16.21 The maximum sensitivity of receptors in the area is low and the greatest magnitude of impact has been assessed as medium. Therefore, the significance of effect from the displacement of commercial fisheries leading to gear conflict and increase pressure from the installation of Dublin Array cumulatively with the Tier 1 projects is no higher than the residual effect of Dublin Array in isolation during its operational phase, i.e., **Slight adverse** for Irish potters targeting whelk, crab and lobster, and **Imperceptible** for all other fleets, which is not significant in EIA terms.

Tier 2

9.16.22 The Tier 2 assessment includes two additional offshore energy projects: Holyhead Deep and Awel y Môr Offshore Wind Farm which is approximately 130 km away from Dublin Array. Based on the distances of these projects to Dublin Array, displacement effects at a cumulative scale are not anticipated.

9.16.23 Therefore, the significance of effect from the displacement of commercial fisheries leading to gear conflict and increase pressure from the installation of Dublin Array cumulatively with the Tier 2 projects is no higher than the residual effect of Dublin Array in isolation during its construction phase, i.e., **Slight adverse** for Irish potters targeting whelk, crab and lobster, **Slight adverse** for scallop dredgers, demersal otter trawl and beam trawl fleets and **Imperceptible** for all other fleets, which is not significant in EIA terms.

Tier 3

9.16.24 When assessed cumulatively with the Tier 3 Phase 1 Projects the impact of the magnitude is considered to increase to Medium for the potting fishery. The Phase 1 Projects are considered to have a similar individual, but additive contribution to cumulative magnitude impacts related to displacement, specifically for potting vessels targeting whelk. These vessels will be displaced into areas already targeted for whelk, leading to increased competition for space and increased pressure on the whelk resources. Displacement occurring across multiple projects is difficult to attribute to a specific project. Mitigation at individual project level is recognised as effective for mitigating the impact of loss of fishing grounds, however, these displaced vessels are likely to seek alternative grounds, leading to increased competition. It is noted that the Dublin Array alone impacts were not significant, however notwithstanding this, an overall cumulative Medium impact is assessed due to multiple Phase 1 Projects construction impacts within the defined whelk fishing grounds which could lead to displacement into areas with existing high effort.

9.16.25 For the other fisheries, the impact of the magnitude is considered to be no more than the Dublin Array alone impacts which are Low to Negligible. This is due to the very low contribution of the Project to any potential loss of access to other fishing fleets and thereby displacement is not anticipated at a cumulative level.

9.16.26 Overall, the cumulative magnitude of the impact is deemed **Medium** for the potting fishery, which has a **Medium** sensitivity, and therefore the significance of effect is **Moderate adverse**, which is significant in EIA terms for both MDO and alternative design options.

9.16.27 For the other fisheries, the effect will be no more than the proposed development alone residual effects which are **Not significant** for all other fisheries.

9.16.28 For the other Tier 3 projects identified in Table 43, due to the limited overlap of the receptors active within Dublin Array, the significance of effect of cumulative displacement is no higher than assessed for the Phase 1 Projects.

Proposed Mitigation

9.16.29 Irish potting fleet: In order to mitigate the potential cumulative effects on the whelk fishery during the construction phase, the Developer will continue to liaise with other Phase 1 Project developers and continue to actively participate in the Seafood / ORE Working Group, including commitment to joint development and implementation of approaches to mitigating the cumulative effects of displacement. Further details are provided within the FMMS (Volume 7, Appendix 3).

Residual Effect Assessment

9.16.30 Irish potting fleet: The FMMS provides mitigation including joint development of approaches to mitigate cumulative displacement effects for the Irish whelk potting fleet, the impact magnitude is therefore reduced to **Low**, and the residual effect is of **Slight adverse** significance, which is **Not significant** in EIA terms.

9.17 Interactions of the environmental factors

9.17.1 A matrix illustrating where interactions between effects on different factors have been addressed is provided in Volume 8, Chapter 1: Interactions of the Environmental Factors.

9.17.2 Interactions of the environmental factors are considered to be the effects and associated effects of different aspects of the proposal on the same receptor. These are considered to be:

- Project lifetime effects: Assessment of the scope for effects that occur throughout more than one phase of the project (construction, O&M and decommissioning) to interact and potentially create a more significant effect on a receptor than if just assessed in isolation in these three key project phases; and

- Receptor led effects: Assessment of the scope for all effects to interact, spatially and temporally, to create inter-related effects on a receptor. As an example, all effects on benthic ecology such as direct habitat loss or disturbance, sediment plumes, scour, jack up vessel use etc., may interact to produce a different, or greater effect on this receptor than when the effects are considered in isolation. Receptor-led effects might be short-term, temporary or transient effects.

9.17.3 As indicated in the interactions matrix (Volume 8, Chapter 1) there are linkages between the topic-specific chapters presented within this EIAR, whereby the effects assessed in one chapter have the potential to result in secondary effects on another receptor.

9.17.0 The potential effects on commercial fisheries during construction, operational and maintenance and decommissioning phases of the Project have been assessed in sections 9.13 – 9.15 above.

9.17.1 Effects on commercial fisheries (i.e. from effects to fishing grounds and species availability) also have the potential to have secondary effects on other receptors which have been fully assessed in the topic-specific chapters. These receptors are:

- Volume 3, Chapter 5: Fish and Shellfish. Effects on fish and shellfish receptors also have the potential to have secondary effects on commercial fisheries. Those potential effects are considered within Chapter 5.

- Volume 3, Chapter 11: Shipping and Navigation. Effects on shipping and navigation receptors also have the potential to have secondary effects on commercial fisheries. Those potential effects are considered within Chapter 11: Shipping and Navigation.

9.17.2 For Commercial Fishery receptors, the following potential impacts have been considered within the interactions assessment:

- Loss of grounds or restricted access to fishing grounds;

- Displacement of fishing activity into other areas;

- Interference or disruption of fishing activities; and

- Gear snagging (loss/damage of fishing gear).

Project lifetime effects

9.17.0 Project lifetime effects consider impacts from the construction, operation or decommissioning of Dublin Array on the same receptor (or group). The potential inter-related effects that could arise in relation to commercial fisheries are presented in Table 45.

Table 45 Project lifetime effects assessment for potential inter-related effects on commercial fisheries

Impact Type	Effects (Assessment Alone)			Interaction Assessment
	C	O&M	D	Project lifetime effects
Loss of grounds or restricted access to fishing grounds	Slight Adverse (array area and offshore ECC)	Slight Adverse (array area and offshore ECC)	Slight Adverse (array area and offshore ECC)	During construction and decommissioning phases of the project, advisory safety zones, and therefore the areas from which commercial fishing will be excluded, will be highly localised. During all phases of the project, safety zones, and therefore the areas from which commercial fishing will be excluded, will be highly localised. During construction, for example, fishing will be excluded from temporary 500 m roaming advisory safety zones around cable installation activities. During operation, there will be no formal exclusion of fishing activity except for within temporary 500 m roaming safety zones implemented during major maintenance activities along the Cable Corridor. In addition, disruption to Irish potters along the Cable Corridor and Working Area during construction will reduce during the operational and maintenance phase. Although there will be a small temporary incremental increase in the area in which fishing may be disrupted as the project is built out, as fishing activity is likely to be able to continue during the operational and maintenance phase, effects on commercial fisheries across the phases are not anticipated to interact in such a way as to result in combined effects of greater significance than the assessments presented for each individual phase.

Impact Type	Effects (Assessment Alone)			Interaction Assessment
	C	O&M	D	Project lifetime effects
Displacement of fishing activity into other areas	Slight adverse (Potting fisheries) Slight adverse (Dredge, otter trawl and beam trawl fisheries) Imperceptible (All other fisheries)	Slight adverse (Potting fisheries) Imperceptible (All other fisheries)	Slight adverse (Potting fisheries) Slight adverse (Dredge, otter trawl and beam trawl fisheries) Imperceptible (All other fisheries)	Fishing may be disrupted, and partial exclusion may occur during the construction, operational and maintenance and decommissioning phases of the proposed development. However, it is anticipated that fishing will resume where productive grounds can be targeted, with the exception of advisory safety zones around infrastructure undergoing major maintenance and advisory safe distances around vessels undertaking major maintenance activities. Furthermore, in liaison with commercial fisheries, prior to construction a FMMS will be developed, setting out in detail the planned approach to fisheries liaison with stakeholders and means of delivering any other relevant mitigation measures where identified as necessary. Therefore, effects on commercial fisheries are not anticipated to interact in such a way as to result in combined effects of greater significance than the assessments presented for each individual phase.
Interference or disruption of fishing activities	Slight adverse (Potting and dredge fisheries) Slight adverse (Otter trawl and beam trawl fisheries) Imperceptible (All other fisheries)	Slight adverse (Whelk potting fishery) Slight adverse (Crab and lobster potting fishery, scallop dredge, otter trawl and beam trawl fisheries) Imperceptible (All other fisheries)	Slight adverse (Potting and dredge fisheries) Slight adverse (Otter trawl and beam trawl fisheries) Imperceptible (All other fisheries)	With the successful implementation of measures adopted for this development (i.e. issue of Notices to Mariners (NTMs), preparation of a FMMS (Fisheries Management and Mitigation Strategy), close liaison with the local vessels), no significant effects are predicted for the construction, operation and maintenance, and decommissioning phases of the project. The majority of vessel traffic (resulting in interference with fishing) is predicted to peak during construction and decommissioning with reduced potential for interference during the operation and maintenance phase. Therefore, across the project lifetime, the effects on commercial

Impact Type	Effects (Assessment Alone)			Interaction Assessment
	C	O&M	D	Project lifetime effects
				fisheries are not anticipated to interact in such a way as to result in combined effects of greater significance than the assessments presented for each individual phase.
Gear snagging (loss/damage of fishing gear)	N/A	Slight Adverse (Potting fisheries) Slight Adverse (Scallop dredge, otter trawl and beam trawl fisheries) Imperceptible (All other fisheries)	N/A	Impacts due to gear snagging have the potential to occur during the operational and maintenance phase only due to the presence of cable protection on the seabed and the presence of the export cable and inter-array cables. During decommissioning it is expected that wind turbine infrastructure will be removed although cable and scour protection will be left in situ following decommissioning. As such there will be no interactions between effects across the project phases. In addition, factored-in measures will be implemented to reduce the risk of injury occurring during construction thereby reducing the potential for long-term effects on individuals.

Receptor led effects

9.17.1 Inter-related effects from the combination of the reduction in access to fishing grounds and the subsequent increased pressure on adjacent grounds: During the construction and decommissioning phases, both effects will be temporary and short lived, with access to fishing grounds being prevented where construction and decommissioning activity is taking place. During operation the effects will be different depending on the receptors affected. The Irish potting fleet may access specific grounds within the Array Area or move to other fishing areas in the inshore area, which could put them into conflict with other potting fleet operators. As a result, the static fleets will be subjected to potential increases in pressure on their grounds. While the two effects may act together, it is considered that appropriately mitigated loss of access will limit the impact of displacement and that therefore, overall, any inter-related effect will not be of any greater significance than those already assessed in isolation (i.e. slight adverse significance). All inter-related effects result in a neutral significance of effect, which is not significant in EIA terms.

9.18 Transboundary statement

9.18.1 Transboundary effects arise when impacts from a development within one state affect the environment of other states outside of the Irish EEZ.

9.18.2 The potential transboundary impacts assessed for commercial fisheries are:

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

9.18.3 Effects on biological resources could occur over a range of tens of kilometres from Dublin Array and could therefore interact with the following states: UK and Isle of Man. Based on the slight to negligible significance of disruption to commercial species during all phases of Dublin Array, it is expected that the impact on stocks in UK and Isle of Man waters is negligible. Therefore, the potential transboundary impact of effects on commercial fish stocks in the waters of other states on commercial fisheries is concluded to be **Imperceptible**, and is therefore considered to be not significant in EIA terms.

9.18.4 Effects on commercial fishing fleets could occur over a range of 100s of kilometres from Dublin Array (i.e. affecting fleets from other States that operate in the vicinity of Dublin Array) and could therefore interact with UK and Belgian fishing fleets. Effects on these foreign commercial fishing fleets, in terms of reduction in access to fishing grounds and displacement into alternative grounds including other EEZs, have therefore been intrinsically considered throughout the commercial fisheries impact assessment process and are consistent to those presented in Sections 9.13 to 9.16.

9.19 Summary of effects

9.19.1 Table 46 presents a summary of the assessment of significant impacts, any relevant further mitigation measures and residual effects on commercial fisheries receptors.

Table 46 Summary of effect on Commercial Fisheries

Description of effect	Effect (per fishing fleet)		Additional mitigation measures	Residual effect
Construction				
Impact 1: Array area construction activities and physical presence of constructed wind farm infrastructure leading to reduction in access to, or exclusion from established fishing grounds.	Irish potting fleet (whelk):	Moderate adverse	Implementation of FMMS, including cooperation agreements and associated payments	Slight adverse
	Irish potting fleet (crab & lobster):	Slight adverse	Not Applicable	Slight adverse
	Scallop dredge fleet (Irish and UK):	Slight adverse		
	Otter trawl fleet (Irish and UK):	Slight adverse		
	Beam trawl fleet (Irish, UK & Belgian):	Slight adverse		
	Mussel seed fishery (Irish):	Imperceptible		Imperceptible
	Razor shell fishery (Irish):	Imperceptible		
	Pelagic trawl fishery (Irish & UK):	Imperceptible		
Impact 2: Offshore export cable construction activities and physical presence of constructed infrastructure leading to reduction in access to, or exclusion from established fishing grounds.	Irish potting fleet (whelk):	Moderate adverse	Implementation of FMMS, including cooperation agreements and associated payments	Slight adverse
	Irish potting fleet (crab & lobster):	Moderate adverse		Slight adverse
	Scallop dredge fleet (Irish and UK):	Slight adverse		Slight adverse
	Otter trawl fleet (Irish and UK):	Slight adverse		
	Beam trawl fleet (Irish, UK & Belgian):	Not significant		Not significant
	Mussel seed fishery (Irish):	Imperceptible		Imperceptible

Description of effect	Effect (per fishing fleet)		Additional mitigation measures	Residual effect
	Razor shell fishery (Irish):	Imperceptible		
	Pelagic trawl fishery (Irish & UK):	Imperceptible		
Impact 3: Displacement from Dublin Array leading to gear conflict and increased fishing pressure on adjacent grounds.	Irish potting fleet (whelk):	Slight adverse	Not Applicable	Slight adverse
	Irish potting fleet (crab & lobster):	Slight adverse		
	Scallop dredge fleet (Irish and UK):	Slight adverse		Slight adverse
	Otter trawl fleet (Irish and UK):	Slight adverse		
	Beam trawl fleet (Irish, UK & Belgian):	Slight adverse		
	Mussel seed fishery (Irish):	Imperceptible		Imperceptible
	Razor shell fishery (Irish):	Imperceptible		
	Pelagic trawl fishery (Irish & UK):	Imperceptible		
Impact 4: Array area and Offshore ECC construction activities leading to disturbance of commercially important fish and shellfish resources leading to displacement or disruption of fishing activity	Irish potting fleet (whelk):	Slight adverse	Not Applicable	Slight adverse
	Irish potting fleet (crab & lobster):	Slight adverse		
	Scallop dredge fleet (Irish and UK):	Slight adverse		
	Otter trawl fleet (Irish and UK):	Slight adverse		
	Beam trawl fleet (Irish, UK & Belgian):	Slight adverse		
	Mussel seed fishery (Irish):	Imperceptible		Imperceptible
	Razor shell fishery (Irish):	Imperceptible		
	Pelagic trawl fishery (Irish & UK):	Imperceptible		
Impact 5: Increased vessel traffic associated with Dublin Array within fishing grounds leading to interference with fishing activity.	Irish potting fleet (whelk):	Slight adverse	Not Applicable	Slight adverse
	Irish potting fleet (crab & lobster):	Slight adverse		
	Scallop dredge fleet (Irish and UK):	Imperceptible		Imperceptible
	Otter trawl fleet (Irish and UK):	Imperceptible		

Description of effect	Effect (per fishing fleet)		Additional mitigation measures	Residual effect
	Beam trawl fleet (Irish, UK & Belgian):	Imperceptible		
	Mussel seed fishery (Irish):	Imperceptible		
	Razor shell fishery (Irish):	Imperceptible		
	Pelagic trawl fishery (Irish & UK):	Imperceptible		
Operation and maintenance				
Impact 6: Physical presence of array area infrastructure leading to reduction in access to, or exclusion from established fishing grounds	Irish potting fleet (whelk):	Moderate adverse	Implementation of FMMS; gear trials to access practicality of potting activity resumption; monitoring of catch rates within array area.	Slight adverse
	Irish potting fleet (crab & lobster):	Slight adverse	Not Applicable	Slight adverse
	Scallop dredge fleet (Irish and UK):	Slight adverse		
	Otter trawl fleet (Irish and UK):	Slight adverse		
	Beam trawl fleet (Irish, UK & Belgian):	Slight adverse		
	Mussel seed fishery (Irish):	Imperceptible		Imperceptible
	Razor shell fishery (Irish):	Imperceptible		
	Pelagic trawl fishery (Irish & UK):	Imperceptible		
Impact 7: Physical presence of Offshore ECC leading to reduction in access to, or exclusion from established fishing grounds	Irish potting fleet (whelk):	Slight adverse	Not Applicable	Slight adverse
	Irish potting fleet (crab & lobster):	Slight adverse		
	Scallop dredge fleet (Irish and UK):	Imperceptible		Imperceptible
	Otter trawl fleet (Irish and UK):	Imperceptible		
	Beam trawl fleet (Irish, UK & Belgian):	Imperceptible		

Description of effect	Effect (per fishing fleet)		Additional mitigation measures	Residual effect
	Mussel seed fishery (Irish):	Imperceptible		
	Razor shell fishery (Irish):	Imperceptible		
	Pelagic trawl fishery (Irish & UK):	Imperceptible		
Impact 8: Displacement from Dublin Array leading to gear conflict and increased fishing pressure on adjacent grounds	Irish potting fleet (whelk):	Slight adverse	Not Applicable	Slight adverse
	Irish potting fleet (crab & lobster):	Slight adverse		
	Scallop dredge fleet (Irish and UK):	Imperceptible		Imperceptible
	Otter trawl fleet (Irish and UK):	Imperceptible		
	Beam trawl fleet (Irish, UK & Belgian):	Imperceptible		
	Mussel seed fishery (Irish):	Imperceptible		
	Razor shell fishery (Irish):	Imperceptible		
	Pelagic trawl fishery (Irish & UK):	Imperceptible		
Impact 9: Dublin Array operation and maintenance activities leading to displacement or disruption of commercially important fish and shellfish resources	Irish potting fleet (whelk):	Slight adverse	Not Applicable	Slight adverse
	Irish potting fleet (crab & lobster):	Slight adverse		
	Scallop dredge fleet (Irish and UK):	Slight adverse		
	Otter trawl fleet (Irish and UK):	Slight adverse		
	Beam trawl fleet (Irish, UK & Belgian):	Slight adverse		
	Mussel seed fishery (Irish):	Imperceptible		Imperceptible
	Razor shell fishery (Irish):	Imperceptible		
	Pelagic trawl fishery (Irish & UK):	Imperceptible		
Impact 10: Increased vessel traffic within fishing grounds as a result of changes to shipping routes and	Irish potting fleet (whelk):	Slight adverse	Not Applicable	Slight adverse
	Irish potting fleet (crab & lobster):	Slight adverse		
	Scallop dredge fleet (Irish and UK):	Imperceptible		Imperceptible

Description of effect	Effect (per fishing fleet)		Additional mitigation measures	Residual effect
maintenance vessel traffic from Dublin Array leading to interference with fishing activity	Otter trawl fleet (Irish and UK):	Imperceptible		
	Beam trawl fleet (Irish, UK & Belgian):	Imperceptible		
	Mussel seed fishery (Irish):	Imperceptible		
	Razor shell fishery (Irish):	Imperceptible		
	Pelagic trawl fishery (Irish & UK):	Imperceptible		
Impact 11: Physical presence of Dublin Array infrastructure leading to gear snagging	Irish potting fleet (whelk):	Slight adverse	Not Applicable	Slight adverse
	Irish potting fleet (crab & lobster):	Slight adverse		
	Scallop dredge fleet (Irish and UK):	Slight adverse		
	Otter trawl fleet (Irish and UK):	Slight adverse		
	Beam trawl fleet (Irish, UK & Belgian):	Slight adverse		
	Mussel seed fishery (Irish):	Imperceptible		Imperceptible
	Razor shell fishery (Irish):	Imperceptible		
	Pelagic trawl fishery (Irish & UK):	Imperceptible		
Decommissioning				
Impact 12: Array area decommissioning activities leading to reduction in access to, or exclusion from, potential and/or established fishing grounds	Irish potting fleet (whelk):	Moderate adverse	Implementation of FMMS, including cooperation agreements and associated payments	Slight adverse
	Irish potting fleet (crab & lobster):	Slight adverse	Not Applicable	Slight adverse
	Scallop dredge fleet (Irish and UK):	Slight adverse		
	Otter trawl fleet (Irish and UK):	Slight adverse		

Description of effect	Effect (per fishing fleet)		Additional mitigation measures	Residual effect
	Beam trawl fleet (Irish, UK & Belgian):	Slight adverse		
	Mussel seed fishery (Irish):	Imperceptible		Imperceptible
	Razor shell fishery (Irish):	Imperceptible		
	Pelagic trawl fishery (Irish & UK):	Imperceptible		
Impact 13: Offshore ECC decommissioning activities leading to reduction in access to, or exclusion from established fishing grounds;	Irish potting fleet (whelk):	Moderate adverse	Implementation of FMMS, including cooperation agreements and associated payments	Slight adverse
	Irish potting fleet (crab & lobster):	Moderate adverse		Slight adverse
	Scallop dredge fleet (Irish and UK):	Slight adverse	Not Applicable	Slight adverse
	Otter trawl fleet (Irish and UK):	Slight adverse		
	Beam trawl fleet (Irish, UK & Belgian):	Not significant		Not significant
	Mussel seed fishery (Irish):	Imperceptible		Imperceptible
	Razor shell fishery (Irish):	Imperceptible		
	Pelagic trawl fishery (Irish & UK):	Imperceptible		
Impact 14: Displacement from the array area and offshore ECC leading to gear conflict and increased fishing pressure on adjacent grounds;	Irish potting fleet (whelk):	Moderate adverse	Not Applicable	Slight adverse
	Irish potting fleet (crab & lobster):	Slight adverse		
	Scallop dredge fleet (Irish and UK):	Slight adverse		Slight adverse
	Otter trawl fleet (Irish and UK):	Slight adverse		
	Beam trawl fleet (Irish, UK & Belgian):	Slight adverse		
	Mussel seed fishery (Irish):	Imperceptible		Imperceptible

Description of effect	Effect (per fishing fleet)		Additional mitigation measures	Residual effect
	Razor shell fishery (Irish):	Imperceptible		
	Pelagic trawl fishery (Irish & UK):	Imperceptible		
Impact 15: Decommissioning activities leading to displacement or disruption of commercially important fish and shellfish resources;	Irish potting fleet (whelk):	Slight adverse	Not Applicable	Slight adverse
	Irish potting fleet (crab & lobster):	Slight adverse		
	Scallop dredge fleet (Irish and UK):	Slight adverse		
	Otter trawl fleet (Irish and UK):	Slight adverse		
	Beam trawl fleet (Irish, UK & Belgian):	Slight adverse		
	Mussel seed fishery (Irish):	Imperceptible		Imperceptible
	Razor shell fishery (Irish):	Imperceptible		
	Pelagic trawl fishery (Irish & UK):	Imperceptible		
Impact 16: Increased vessel traffic within fishing grounds as a result of changes to shipping routes and transiting decommissioning vessel traffic from Dublin Array leading to interference with fishing activity;	Irish potting fleet (whelk):	Slight adverse	Not Applicable	Slight adverse
	Irish potting fleet (crab & lobster):	Slight adverse		
	Scallop dredge fleet (Irish and UK):	Imperceptible		Imperceptible
	Otter trawl fleet (Irish and UK):	Imperceptible		
	Beam trawl fleet (Irish, UK & Belgian):	Imperceptible		
	Mussel seed fishery (Irish):	Imperceptible		
	Razor shell fishery (Irish):	Imperceptible		
	Pelagic trawl fishery (Irish & UK):	Imperceptible		
Impact 17: Physical presence of any infrastructure left in situ leading to gear snagging.	Irish potting fleet (whelk):	Slight adverse	Not Applicable	Slight adverse
	Irish potting fleet (crab & lobster):	Slight adverse		
	Scallop dredge fleet (Irish and UK):	Slight adverse		
	Otter trawl fleet (Irish and UK):	Slight adverse		

Description of effect	Effect (per fishing fleet)		Additional mitigation measures	Residual effect
	Beam trawl fleet (Irish, UK & Belgian):	Slight adverse		
	Mussel seed fishery (Irish):	Imperceptible		Imperceptible
	Razor shell fishery (Irish):	Imperceptible		
	Pelagic trawl fishery (Irish & UK):	Imperceptible		
Cumulative				
Effect 18: Reduction in access to, or exclusion from established fishing grounds	Irish potting fleet (whelk):	Slight adverse	Not Applicable	Slight adverse
	Irish potting fleet (crab & lobster):	Slight adverse		Slight adverse
	Scallop dredge fleet (Irish and UK):	Slight adverse		
	Otter trawl fleet (Irish and UK):	Slight adverse		
	Beam trawl fleet (Irish, UK & Belgian):	Slight adverse		
	Mussel seed fishery (Irish):	Imperceptible		Imperceptible
	Razor shell fishery (Irish):	Imperceptible		
	Pelagic trawl fishery (Irish & UK):	Imperceptible		
Effect 19: Displacement leading to gear conflict and increased fishing pressure on established fishing grounds	Irish potting fleet (whelk):	Moderate adverse	Participate in the Seafood / ORE Working Group, including commitment to joint development and implementation of cumulative mitigation approaches	Moderate adverse
	Irish potting fleet (crab & lobster):	Moderate adverse		
	Scallop dredge fleet (Irish and UK):	Slight adverse	Not Applicable	Slight adverse
	Otter trawl fleet (Irish and UK):	Slight adverse		
	Beam trawl fleet (Irish, UK & Belgian):	Slight adverse		

Description of effect	Effect (per fishing fleet)		Additional mitigation measures	Residual effect
	Mussel seed fishery (Irish):	Imperceptible		Imperceptible
	Razor shell fishery (Irish):	Imperceptible		
	Pelagic trawl fishery (Irish & UK):	Imperceptible		
Transboundary				
Effects on commercial fishing fleets as a result of impacts from Dublin Array on commercial fish stocks in the waters of other EEA States	As described in Section 9.18, transboundary effects are not anticipated			
Effects on commercial fishing fleets from all EEA countries as a result of constraints on foreign commercial fishing activities operating in Dublin Array	As described in Section 9.18, transboundary effects are not anticipated			

9.20 References

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Dublin Array Offshore Wind Farm

Environmental Impact Assessment Report

Annex A: Commercial Fisheries Policy

Legislation, Policy and Guidance

Policy/ Legislation	Key provisions	Section where provision is addressed
Legislation		
The EIA Regulations (S.I. No. 296 of 2018) Part 2, Section 8 (b) Section 294(4) of the Planning and Development Act 2000, as amended	"(4) A copy of a decision referred to in subsection (1) shall contain— (a) a summary of— (i) the outcome of any consultation that took place in relation to the application concerned, and (ii) the manner in which the matters (if any) agreed during such consultation were taken account of in the decision or otherwise addressed, (b) a summary of the information collected during the carrying out of an environmental impact assessment in relation to the application, and (c) a summary of any submissions or observations of a Member State of the European Union or a state that is a party to the Transboundary Convention in relation to the application.."	The consultation undertaken with the commercial fishing industry, statutory consultees and stakeholders is provided in Section 9.3.
Planning and Development Regulations, 2001, as amended Schedule 6, Part 2 (d)	"A description of the aspects of the environment likely to be significantly affected by the proposed development, including in particular: … - human beings, fauna and flora" (d) a description of the factors specified in … the definition of 'environmental impact assessment' … likely to be significantly affected by the proposed development: population, human health, biodiversity (for example fauna and flora), land (for example land take), … material assets, cultural heritage…;	This assessment provides a description of the likely significant effects on the commercial fisheries industry and resources in conjunction with the Fish and Shellfish Ecology Chapter, Shipping and Navigation Chapter, and the Socio-economics, Tourism, Recreation Land Use Chapter.

Policy/ Legislation	Key provisions	Section where provision is addressed
Guidelines and technical standards		
Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning and Local Government, 2018) (hereafter referred to as the EIA Guidelines, 2018) Para 4.31.	"The starting point for EIA is an assessment of the current state of the environment and how this is likely to evolve without the proposed project but having regard to existing and approved projects and likely significant cumulative effects – in other words the 'do nothing' scenario."	A full characterisation of the receiving environment is presented in the Commercial Fisheries Technical Baseline. The findings of this characterisation have been summarised in Section 9.6.
EIA Guidelines, 2018 Para 4.33.	"Much relevant data is likely to be publicly available and accessible e.g. through other relevant environmental assessments, databases, relevant websites etc., but other data may require elements of research and surveying to facilitate an understanding of the extent of environmental impacts."	The commercial fisheries receiving environment has been characterised through a detailed and rigorous desk-based assessment of data and literature. Both publicly available data sets and data resultant from specific requests have been analysed. Landings statistics have been analysed using excel and Vessel Monitoring System (VMS) data have been evaluated using ArcMap Geographic Information System (GIS) software. This quantitative data has been augmented by qualitative information gained through direct consultation with the fishing industry, and significant communication and discussion between the onshore Fisheries Liaison Officer (FLO) and the fishing industry.

Policy/ Legislation	Key provisions	Section where provision is addressed
		In addition to fisheries dependant data, a targeted fisheries trawl survey of the Kish and Bray Banks was undertaken focused on finfish and elasmobranchs. A full characterisation of the receiving environment is presented in the Commercial Fisheries Technical Baseline. The findings of this characterisation have been summarised in Section 9.6.
EIA Guidelines, 2018 Para 6.8.	"'Significance' is a core concept of the EIA Directive and is project-specific. Common criteria used to evaluate significance include the magnitude of the predicted effect and the sensitivity of the receiving environment. 'Significance' considers whether or not a project's impact can be determined to be unacceptable in its environmental and social contexts."	Criteria specific to commercial fisheries have been developed for assessing the magnitude and sensitivity and are described in Section 9.1.
EIA Guidelines, 2018 Para 6.12.	"The Directive requires that the EIAR describes the cumulation of effects[10]. Cumulative effects may arise from: ▪ The interaction between the various impacts within a single project; The interaction between all of the different existing and/or approved projects in the same area as the proposed project."	The interactions between various environmental aspects within the proposed developments are presented in Volume 5 of this EIAR. The interactions between Dublin Array and other plans and projects, for commercial fisheries in provided in Section 9.16.
DCCAE Guidance Part 1, 2018	The baseline should identify the commercially important fish assemblages for the area of potential impact so that any changes in the community composition or biomass/yield can be tracked. Fisheries data may be used if available. Otherwise, it may be necessary to conduct acoustic/trawl surveys to collect the required data. Some level of direct baseline investigation is likely to be appropriate, due to concerns that not all	The commercial fisheries receiving environment has been characterized through assessment of fisheries dependent data, including landing statistics (from national, regional and local levels), VMS and import/export data, as

[10] Annex IV, point 5(e) of the Directive. See also Schedule 6(2)(e)(i)(V) to the Regulations.

Policy/ Legislation	Key provisions	Section where provision is addressed
	resources may be identified and documented through the analysis of fishery dependent data alone.	well as fisheries independent data obtained through a site specific trawl survey data. A full characterisation of the receiving environment is presented in the Commercial Fisheries Technical Baseline. The findings of this characterisation have been summarised in Section 9.6.
DCCAE Guidance Part 2, 2018 Section 10.1, 1st paragraph	There is potential for both negative and positive impacts of offshore energy development on commercial fisheries. A survey of fishers undertaken in Ireland found 70% believe that marine energy developments and fishing can co-exist. The greatest potential impact is restriction of access to traditional fishing grounds within the footprint of any development, and the exclusion of fishers from areas of infrastructure related to any development.	The assessment of impacts to commercial fisheries is presented in Sections 9.13 to 9.15, including potential loss of access to fishing grounds at each stage of the development: construction, operation and maintenance and decommissioning. The impact assessment assumes that fishing will resume to the extent practicable within the Dublin Array (i.e., with the exception of the physical presence of infrastructure and any associated advisory safe passing distances).
DCCAE Guidance Part 2, 2018 Section 10.1, 2nd paragraph	Commercial fish stocks may be affected by potential impacts from renewable offshore energy development. Changes to currents, sedimentation rates and other physical processes could be of importance in the Biologically Sensitive Area in the southwest identified as important for larval/juvenile stages of hake, cod, herring and haddock. Studies on effects of electro- magnetic fields (EMF) on fish species suggest they are likely to be short lived, but may be of particular concern for salmonids and eels, and species where juveniles undergo large migrations. There is potential for large-scale ocean energy developments to affect such migrations.	The impact of Dublin Array in relation to any changes to fish and shellfish populations including due to EMF, sedimentation, and other physical processes, is provided in the Fish and Shellfish Ecology Chapter. The subsequent impact on commercial fish and shellfish resources is assessed in Sections 9.13 to 9.15 of this Chapter.

Policy/ Legislation	Key provisions	Section where provision is addressed
DCCAE Guidance Part 2, 2018 Section 10.1.1, Pre-construction baseline- Identification of potential impacts	Devices have the potential to create artificial reef type effects and result in fish aggregation effects. Devices also have the potential to create Electromagnetic Fields (EMF). Pollution may result from spillage of oil or fuel from construction vessels and devices. Such impacts may have the potential to lead to a reduction in biomass/population size and changes to population structure, community assemblage, growth/productivity, and behaviour/catchability leading to potential changes in productivity and yield to the fishery. While there is a lack of current deployments against which potential impacts can be fully assessed, some evidence suggests that changes can occur in fish assemblages and densities at offshore energy sites. This may be due to the introduction of a new habitat type, or due to changes in ecological processes associated with the construction of the development.	(See previous page)
DCCAE Guidance Part 2, 2018 Section 10.1.1, Pre-construction baseline- Survey method	The commercial fisheries, taking place within the footprint of the development and within any exclusion zones, should be identified through consultation with the relevant authority. The baseline should identify the commercially important fish assemblages for the area of potential impact so that any changes in the community composition or biomass/yield can be tracked. Fisheries data may be used if available. Otherwise, it may be necessary to conduct acoustic/trawl surveys to collect the required data. Some level of direct baseline investigation is likely to be appropriate, due to concerns that not all resources may be identified and documented through the analysis of fishery dependent data alone. In this context, it is highly likely that there will be significant temporal differences in fish community assemblages, as well as abundance of individual species. This must be taken into consideration when planning for baseline surveys and monitoring.	The commercial fisheries receiving environment has been characterized through assessment of fisheries dependent data, including landing statistics (from national, regional and local levels), VMS and import/export data, as well as fisheries independent data obtained through a site-specific trawl survey data. A full characterisation of the receiving environment is presented in the Commercial Fisheries Technical Baseline. The findings of this characterisation have been summarised in Section 9.6.
DCCAE Guidance Part 2, 2018 Section 10.2, Shellfish fisheries	Depending on the sea floor type, it is possible that moorings, foundations etc. associated with the development may increase habitat availability to certain target species. It is also possible to enhance this effect through specific design. The addition of holes to sea floor moorings has been	The impact of Dublin Array in relation to any changes to fish and shellfish habitats including introduction of infrastructure, is provided in the Fish and Shellfish Ecology

Policy/ Legislation	Key provisions	Section where provision is addressed
	shown to lead to a five-fold increase in brown crab, *Cancer pagurus*, densities and a reduction in spiny starfish, *Marthasterias glacialis* densities at offshore energy developments.	Chapter. The subsequent impact on commercial fish and shellfish resources is assessed in Sections 9.13 to 9.15 of this Chapter.
DCCAE Guidance Part 2, 2018 Section 10.1.2 and 10.2.2, Post construction monitoring	Underwater survey by diver or ROV to check for changes in fish assemblages at introduced structures associated with moorings, caissons, etc. Divers, ROV or UW video survey can be used to quantify fish aggregation occurring at surface structures associated with the offshore energy development and to monitor shellfish species numbers at these structures.	A commitment to post construction monitoring is outlined in the FMMS.
DCCAE Guidance, 2017	"Cumulative impact assessments only need to take account of existing and/or approved projects and not other projects within the planning process."	A precautionary approach was undertaken to consider and plans or projects which could result in a cumulative effect. The cumulative assessment is presented in Section 9.16. To account for the uncertainty associated with projects and plans which have not yet been consented a tiering system is adopted. Further details of the approach are available in the Cumulative Effect Assessment Methodology Chapter.
DCCAE Guidance, 2017 Section 4.2.2	"Early consultation with stakeholders and other users, particularly mariners and fishers, is essential. Feedback mechanisms should also be established."	The consultation undertaken with the commercial fishing industry, statutory consultees and stakeholders is provided in Section 9.3.
DCCAE Guidance, 2017 Table 4	"developers and competent authorities should have regard to when planning/assessing a project – ▪ Population and human health: Commercial fisheries, shellfish and aquaculture"	An assessment of the potential impact to commercial fisheries is presented in Sections 9.13 to 9.15.

Policy/ Legislation	Key provisions	Section where provision is addressed
DCCAE Guidance, 2017 Section 3.2	"All phases of the development should be considered in the assessment process. Each of these phases will have its own specific effects on the environment and will differ in duration. Considering all phases of the development will address full *lifecycle* effects of a proposed development."	All phases of the development have been considered within this EIA assessment. The assessment of effects in the construction phase are presented in Section Sections 9.13. The assessment of effects in the operational phase (including maintenance) are presented in Section 9.14. The assessment of effects in the decommissioning phase are presented in Section 9.15.

Registered office:
Unit 5,
Desart House,
Lower New Street,
Kilkenny
www.RWE.com