Appendix 12-1: Commercial Fisheries Technical Report

ORIEL WINDFARM
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ORIEL WIND FARM PROJECT

Environmental Impact Assessment Report
Appendix 12-1: Commercial Fisheries Technical Report

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Glossary

Term	Definition
Beam trawlers	A method of bottom trawling with a net that is held open by a beam (a heavy steel tube supported by steel trawl heads at each end). Tickler chains or chain mats, attached between the beam and the ground rope of the net, are used to disturb fish and crustaceans that rise up and fall back into the attached net.
Bord Iascaigh Mhara	Bord Iascaigh Mhara is the agency of the Irish state with responsibility for developing the Irish marine fishing and aquaculture industries.
Department of Agriculture, Food and the Marine	The Department of Agriculture, Food and the Marine is a department of the Government of Ireland.
Demersal	Living on or near the seabed.
Demersal trawl	A fishing net used by towing the trawl along or close to the seabed.
Dredger	These are gears which are dragged along the seabed to catch shellfish. They consist of a mouth frame to which a holding bag, constructed of metal rings or meshes, is attached.
Drift Nets	A net deployed that drifts with the current, in general, near the surface or in mid-water.
European Union Data Collection Framework	An EU framework for the collection and management of fisheries data.
Fishery	A group of vessel voyages which target the same species or use the same gear.
Fishing ground	An area of water or seabed targeted by fishing activity.
Fleet	A physical group of vessels sharing similar characteristics (e.g. nationality, gear type etc.).
Gear type	The method/equipment used for fishing.
Gill net	Fishing net set vertically in the water so that fish swimming into it are entangled in its mesh by their gills.
International Council for the Exploration of the Sea (ICES)	Marine science organisation, meeting societal needs for impartial evidence on the state and sustainable use of our seas and oceans.
ICES statistical rectangles	Defined areas, 1-degree longitude x 0.5 degree latitude equalling approximately 30 x 30 nautical miles (nm) used for fisheries statistics by ICES.
Inland Fisheries Ireland	Inland Fisheries Ireland is a state agency responsible for fisheries management of freshwater fish and coastal fish within 12 nm of the Republic of Ireland.
Landings	Quantitative description of amount of fish returned to port for sale, in terms of value or weight.
Marine Management Organisation (MMO)	A UK government department that license, regulate and plan commercial fisheries activities in the seas around England, with jurisdiction from 0 to 12 nm.
Otter trawl	A net with large rectangular boards (otter boards) which are used to keep the mouth of the trawl net open. Otter boards are made from timber or steel and are positioned in such a way that the hydrodynamic forces, acting on them when the net is towed along the seabed, pushes them outwards and prevents the mouth of the net from closing.
Pelagic	Of or relating to the water column.
Pelagic trawl	A net used to target fish species in the water column.
Pots	A baited trap installed on the seabed.
Scallop dredge	A method to catch scallop using steel dredges with a leading bar fitted with a set of spring loaded, downward pointing teeth. Behind this toothed bar (sword), a matt of steel rings is fitted. A heavy net cover (back) is laced to the frame, sides and after end of the mat to form a bag.
Seines	A very long net, with or without a bag in the centre, which are set either from the shore or from a boat for surrounding a certain area and is operated with two (long) ropes fixed to its ends (for hauling and herding the fish).
Spawning	The act of releasing or depositing eggs (fish).
Vessel Monitoring System	A system used in commercial fishing to allow environmental and fisheries regulatory organisations to monitor, minimally, the position, time at a position, and course and speed of fishing vessels.

Acronyms

Acronym	Description
AIS	Automatic Identification System
ANIFPO	Anglo Northern Ireland Fish Producers Organisation
BIM	Bord Iascaigh Mhara
CFP	Common Fisheries Policy
DAERA	Department of Agriculture, Environment and Rural Affairs
DAFM	Department of Agriculture, Food and the Marine
DCF	Data Collection Framework
EC	European Council
EEZ	Exclusive Economic Zone
EIAR	Environmental Impact Assessment Report
EU	European Union
ICES	International Council for the Exploration of the Sea
IFI	Inland Fisheries Ireland (Iascach Intíre Éireann)
MMO	Marine Management Organisation
NIFPO	Northern Ireland Fish Producers Organisation
RNLI	Royal National Lifeboat Institution
RoI	Republic of Ireland
SAC	Special Area of Conservation
SFPA	Sea-Fisheries Protection Authority
SPA	Special Protection Area
TAC	Total Allowable Catches
UK	United Kingdom
VMS	Vessel Monitoring System

Units

Unit	Description
£	British Pound
€	Euro
kg	kilograms
km	kilometres
m	metres
mm	millimetres
nm	Nautical Mile
T	Tonnes

1 COMMERCIAL FISHERIES TECHNICAL REPORT

1.1 Purpose and Scope

This Commercial Fisheries Technical Report presents baseline information to inform chapter 12: Commercial Fisheries of the Oriel Wind Farm Project (hereafter referred to as "the Project") Environmental Impact Assessment Report (EIAR). The purpose of this Commercial Fisheries Technical Report is to provide a detailed review of the commercial fisheries fleets that operate within and adjacent to the Project on a country basis including the Republic of Ireland (RoI) and the United Kingdom (UK).

1.2 Methodology

1.2.1 Commercial Fisheries Study Area

The Project is located within the northwest portion of the International Council for the Exploration of the Sea (ICES) Division VIIa (Irish Sea). For the purpose of recording fisheries landings, ICES Division VIIa is divided into statistical rectangles. The ICES statistical rectangles are used for the gridding of data to make simplified analysis and visualization.

The Commercial Fisheries Study Area is presented in Figure 1-1 and has been defined as follows:

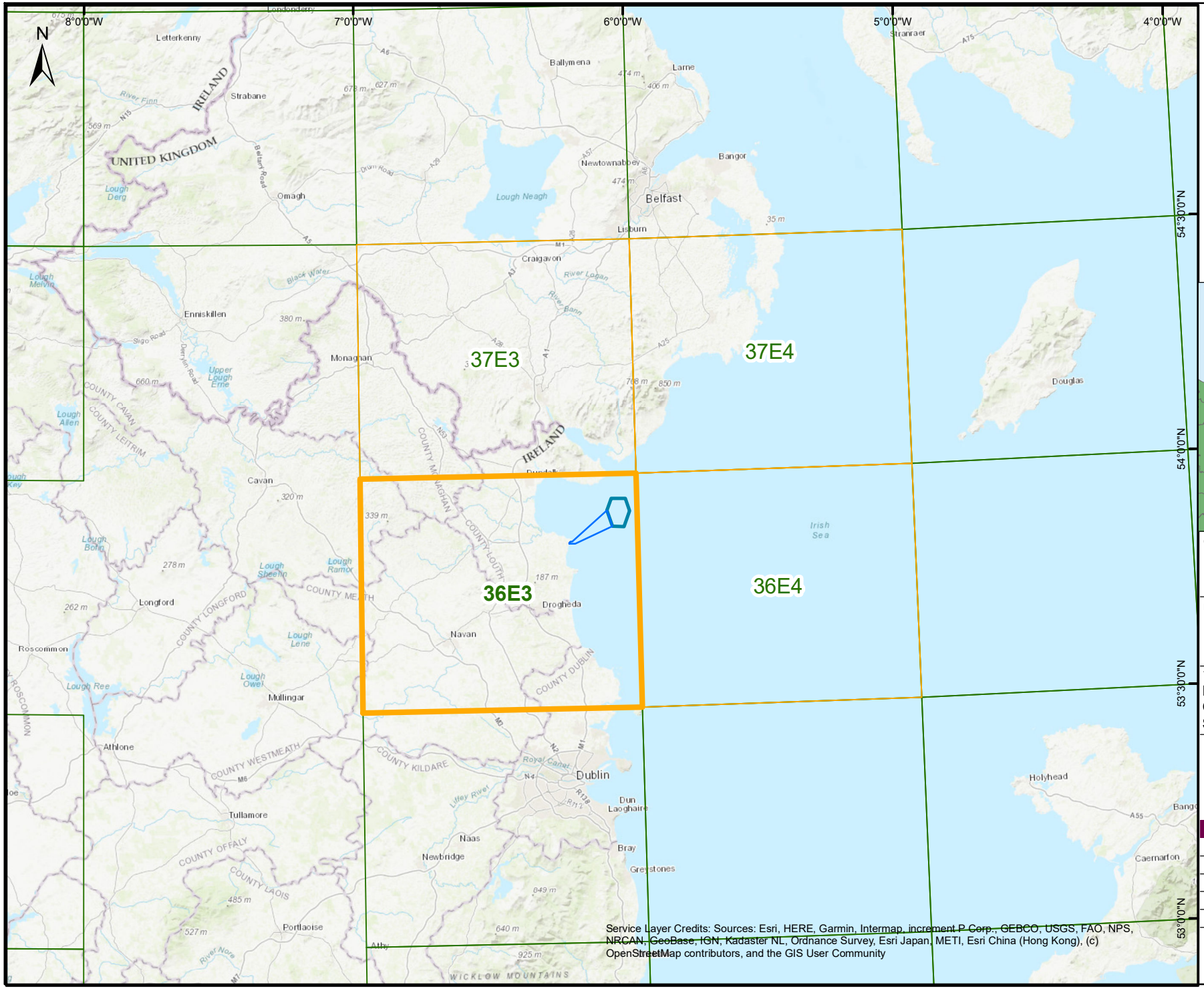
- The Regional Commercial Fisheries Study Area – this is defined as ICES rectangles 36E3, 37E3, 36E4 and 37E4; and
- The Commercial Fisheries Study Area – this is defined as ICES rectangle 36E3.

1.2.2 Consultation

Consultation with identified commercial fisheries stakeholders was undertaken in two phases in late 2019 and early 2021. The purpose of consultation in 2019 was to provide an opportunity for stakeholders to comment on the EIA Scoping Report. In 2021 consultation was undertaken to update stakeholders on proposed changes to the project design and to seek responses from stakeholders that did not respond as part of scoping phase. Stakeholders were consulted individually through direct contact from the Project team following a request for engagement. In addition, regular phone calls, emails and meetings with fisheries organisations and individual fishers on the Project have occurred throughout the period from 2019 to 2024.

A summary of the key issues raised during consultation specific to commercial fisheries is outlined below, together with how these issues have been considered in the production of this Technical Report.

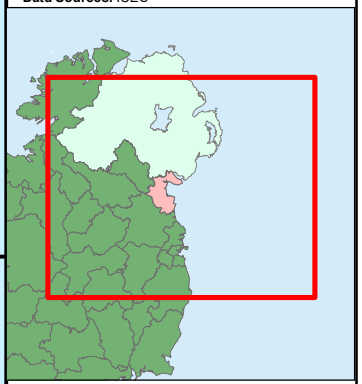
Table 1-1 below summarises the issues raised relevant to commercial fisheries, which have been identified during consultation activities undertaken to date.



Legend

- Offshore Wind Farm Area
- Offshore Cable Corridor
- Commercial Fisheries Study
- Regional Commercial Fisheries Study Area
- ICES Statistical Rectangles

Data Sources: ICES



Client

ORIEL WINDFARM
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Project

Oriel Wind Farm Project

Title

Figure 1-1
Commercial Fisheries Study Area

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Table 1-1: Summary of key data identified during consultation activities undertaken for the project relevant to commercial fisheries.

Date	Consultee and type of response	Data / Information Identified	Where considered in this Technical Report
September 2019	Inland Fisheries Ireland (IFI) – Scoping Response	Identified Coastal and Transitional Waterbodies in the vicinity of the Project including Outer Dundalk Bay and Inner Dundalk Bay which have a status of good and moderate respectively. Provided details of survey carried out by IFI within Inner Dundalk Bay in 2009 which identified 16 species, including sprat, cod, plaice and flounder. Identified that Dundalk Bay is promoted as an angling venue for dogfish, tope, bull huss, mackerel, codling, spurdog, flounder, whiting, coalfish, ling, gurnard, wrasse and pollack. Also identified important fishing rivers (e.g. the rivers Dee, Glyde, Fane, Castletown and Flurry).	Considered within section 1.3.
September 2019	Dundalk Pilot – meeting	Advised that fishing is primarily cockle day boats operating inside port limits. There are 3 x lobster boats operating out towards Imogene navigation buoy. Considered that the Automatic Identification System (AIS) vessel traffic plots (presented in Appendix 13-1: Navigation Risk Assessment) were a fair representation of vessel traffic in Dundalk Bay.	
September 2019	Clogher Head RNLI – meeting	Considered that the AIS fishing boat plots (presented in Appendix 13-1: Navigation Risk Assessment) are a fair representation for commercial fisheries vessels. Advised that fishing activities included: Dublin prawns; razors; lobsters; and crab.	
October 2019	DAERA-NI – email	Landings data from ICES rectangle 36E3 were provided.	
September 2019	Anglo Northern Ireland Fish Producers Organisation (ANIFPO)	Several meetings and telephone calls which highlighted the fishing activity types and number of vessels represented by ANIFPO from Kilkeel fishing in the Outer Dundalk Bay Area.	Considered within section 1.3.
September 2019	Northern Ireland Fish Producers Organisation (NIFPO)	Several meetings and telephone calls which highlighted the fishing activity types and number of vessels represented by NIFPO from Kilkeel fishing in the Outer Dundalk Bay Area.	Considered within section 1.3.
February 2021		Telephone discussion which identified key target species, fishing areas, number and type of vessels and gear types	Considered within section 1.3.
September 2019	Dunany Lobster and Crab	Meetings with representatives to understand the pot fishing being undertaken within the area.	Considered within section 1.3.
March 2021	Dunany Lobster and Crab	Telephone discussion which identified key target species, fishing areas, number and type of vessels and gear types	Considered within section 1.3.
September 2019	Clogherhead Fishing Co-operative - meeting	Meetings with representatives to understand the extent of fishing being undertaken from Port Oriel.	Considered within section 1.3.
September to November 2022	ANIFPO – meetings	Several meetings and telephone calls to provide an update on Project activities and gain a current understanding of the fishing activity types and number of vessels represented by ANIFPO from Kilkeel fishing in the Outer Dundalk Bay Area.	Considered within section 1.3.
November 2022	NIFPO - telephone	Telephone discussion which identified key target species, fishing areas, number and type of vessels and gear types	Considered within section 1.3.
September to December 2022	Dunany Lobster and Crab – meetings	Meetings with representatives to provide an update on the Project site investigation activities and understand the active boats and pot fishing being undertaken within the area.	Considered within section 1.3.

1.2.3 Desktop review

A number of data sources have been used to inform the Commercial Fisheries Technical Report. Data has also been sourced from a number of European fisheries bodies, including Government, research bodies and directly from the fishing industry, such as Inland Fisheries Ireland (Table 1-1).

Other data and information on Commercial Fisheries within the Commercial Fisheries Study Area and Regional Commercial Fisheries Study Area was collected through a detailed desktop review of existing studies and datasets. These are summarised in Table 1-2 below. The data used are the most up to date publicly available information which can be obtained from the applicable data sources as cited.

Table 1-2: Summary of key desktop data and reports.

Title	Source	Year	Author
Future Options for UK Fish Quota Management	Department for the Environment, Food and Rural Affairs	2002	Hatcher *et al.*
A report on fishing in the waters between Carlingford and Clogher Head based on published data, Appendix VIII within Oriel Windfarm Ltd, Offshore Wind Farm, Environmental Impact Statement, Appendices, Volume 3 of 3	Oriel Windfarm Ltd	2003	Roden and Ludgate
Northern Ireland Fleet Futures Analysis (2004 to 2013) – Methodology and Results	University of Portsmouth	2006	Tingley
Offshore Wind Farm, Environmental Impact Statement, Main EIS, Volume 2 of 3, Section 8: Commercial Fisheries	Oriel Windfarm Limited	2007	Aqua-Fact International Services Limited
Atlas of Commercial Fisheries Around Ireland	Marine Institute	2019	Gerritsen and Kelly
Data by quarter-rectangle: Tables and maps of effort and landings by ICES statistical rectangles	https://stecf.jrc.ec.europa.eu/dd/effort	2017	EU DCF
All Landings into Ireland 2017-2020	https://www.sfpa.ie/Statistics/Annual-statistics/Annual-Statistics	2017-2020	Sea-Fisheries Protection Authority (SFPA)
The business of seafood 2017. A snapshot of Ireland's Seafood Sector	http://www.bim.ie/media/bim/content/7097-BIM-Business-of-Seafood-2017.pdf	2017	Bord Iascaigh Mhara (BIM)
UK Sea Fisheries Statistics	Marine Management Organisation	2018	MMO
Data by ICES rectangles; landing statistics data for UK registered vessels for 2015 to 2020.	Marine Management Organisation	2021	MMO
AIS data (January and July 2019, January and July 2022)	Appendix 13-1: Navigation Risk Assessment	2019, 2022	N/A
Ireland's Marine Atlas – Webmap Service • Periwinkle Harvesting Grounds; • Bivalve Mollusc Production Area; • Nets Fishing; • Dredge Fishing; • Pot Fishing; • Mobile Bottom Gear Types; • Mobile Seine Gear Types; • Mobile Other Gear Types; • Passive Gear Type; • Irish and International Beam Trawls Effort 2014 – 2018; • Irish and International Bottom Otter Trawls Effort 2014-18;	Ireland's Marine Atlas	2014-2018 (where shown in the title)	Marine Institute

Title	Source	Year	Author
• Irish and International Dredges Effort 2014-18; • Irish and International Gill Nets Effort 2014-18; • Irish and International Long Lines Effort 2014-18; • Irish and International Pelagic Trawls Effort 2014-18; • Irish and International Pots Effort 2014-18; and • Irish and International Seines Effort 2014-18.			

1.2.4 Data analysis

The key datasets used to characterise the commercial fisheries baseline were landings statistics and fishing effort data (VMS). Landings data were acquired from the European Union Data Collection Framework (EU DCF) and the Marine Management Organisation (MMO). VMS data were accessed via Ireland's Marine Atlas. The methodology used to analyse these data is described below.

Landing statistics

Landings data for the RoI registered vessels and other EU registered vessels are collected via the EU logbooks scheme. These data are recorded by ICES statistical rectangle and stored in the EU DCF database, accessible through the EU Joint Research Committee. Landings data have been collated for ICES rectangle 36E3, 36E4, 37E3 and 37E4. It is important to note that data is only available by ICES rectangles up to 2016, covering a five-year period (2012 to 2016, inclusive). Whilst this data is not contemporary, it is unlikely that market conditions will greatly deviate from data collected over this time period. The following parameters were examined: year; regulated gear; country; ICES rectangle; species; and landed weight (tonnes). In order to derive the value of the EU landed weight, data obtained from the MMO was used as a proxy for species value.

Landing statistics for UK registered vessels were obtained from the MMO with the following parameters: country; year; gear type; ICES rectangle; species; landed weight (tonnes) and value (£). This data has been collated across a six-year period (2015 to 2020, inclusive) to ensure reflection of long-term trends. The following parameters were examined: year; gear type; country; ICES rectangle; species; value (£); and landed weight (tonnes).

Data were analysed using Microsoft Excel and the pivot table function. Once the pivot table was created, data were either sorted or filtered based on the parameters above and the required outcome of the data. Data was then presented using the graph function.

Vessel Monitoring System (VMS) data

All EU fishing vessels (i.e. fishing vessels flying the flag of an EU Member State) and third-party fishing vessels operating in EU waters that are ≥12 m in length, have been required to have a VMS on board since 1 January 2012 (before 1 January 2012 it applied to vessels ≥15 m in length, see Council Regulation European Council (EC) (No 1224/2009). VMS data reports the vessels' position to fisheries management authorities, in the case of EU fishing vessels, every two hours.

A vessel's range varies due to weather conditions and skipper preferences as well as technical aspects such as power, but it is generally the case that vessels <12 m in length fish within 20 nm offshore. Vessels ≥12 m in length can and do fish further afield, but in recent years, many skippers have altered fishing patterns to favour fishing grounds closer to home ports due to increased fuel prices and time at sea restrictions (vessels being permitted a specific number of days at sea). This has particularly affected vessels operating mobile gears with high fuel demands, such as beam trawlers (Curtis *et al.,* 2006).

Although figures mapping VMS data may appear to show inshore areas as having lower (or no) fishing activity compared with offshore areas, it should be noted that VMS data do not include vessels typically operating in inshore areas (i.e. typically vessels <12 m in length). Therefore, VMS data has been supplemented with consultation to determine extent and distribution of activity by the <12 m fleet (Table 1-1).

The Marine Institute collate VMS data for EU registered vessels by aggregating the number of position plots by gear type (mobile bottom gear types, mobile seine gear types, mobile other gear types and passive gear types) in a grid of sub-rectangles approximately 5.3 nm^2 (i.e. at a resolution of 200^{th} of an ICES rectangle). These data are integrated with landings values, thereby providing effort (hours fished) for each sub-rectangle for gear types. These data present an average effort across a five-year period from 2011 to 2016.

1.2.5 Data limitations

The data used are the most up to date publicly available information which can be obtained from the applicable data sources as cited. However, it should be noted that due to the onset of the COVID-19 pandemic and associated restrictions in 2020 and 2021, the most recent data available (from 2020) may not be representative. As such, data has been reviewed and presented across multiple years to ensure an accurate characterisation for the region.

Data has also been provided through consultation, including information on key species targeted and key fishing areas in relation to the proposed offshore wind farm area and cable route. This data was provided in discussion with fisheries consultees. Additional requests were also made during consultation for fishing consultees to provide an indication of key fishing areas on Admiralty charts of the surrounding area. However, no responses were received for this request. As a result, the data provided on vessels <12 m in length has been summarised on a more general fashion based on the discussions held with key fisheries stakeholders.

The data are therefore limited by what is available and by what has been made available, at the time of writing the document.

Limitations of landings data include the potential under-reporting of landings associated with vessels <10 m, which may occur as a result of estimating catches (as opposed to accurate weighing) and not reporting catches that fall below the acceptable limit (i.e. when purchases of first sale fish direct from a fishing vessel are wholly for private consumption, and less than 30 kg is bought per day). This limitation has been managed by supplementing the available data with consultation with fisheries stakeholders and other publicly available sources of evidence.

Limitations of VMS data are primarily focused on the coverage being limited to vessels ≥12 m. It is important to be aware that where mapped VMS data may appear to show inshore areas as having lower (or no) fishing activity compared with offshore areas, VMS data do not include vessels typically operating in inshore areas (i.e. which typically comprise vessels <12 m in length). This is particularly important when identifying the activity across the offshore cable corridor. This limitation has been managed by supplementing the available data with consultation with fisheries stakeholders to determine extent and distribution of activity by the <12 m fleet. However, as noted above this is in the context of the information being provided verbally during consultation rather than as specific data or indications of key fishing grounds.

1.3 Baseline environment

This section describes the baseline environment for Commercial Fisheries. This section firstly describes fisheries management in the EU, before providing information on the type of equipment (gear) used by commercial fisheries, traditional fishing grounds, commercially important species targeted, and fisheries activity around Ireland and within the Regional Commercial Fisheries Study Area and Commercial Fisheries Study Area.

1.3.1 EU fisheries access

Fisheries within the EU are managed under the Common Fisheries Policy (CFP). The purpose of this management system is to safeguard stock reproduction for high long-term yield, ensure a profitable industry and equal fishing opportunities, and to conserve marine resources (EC, 2020). Generally, EU fishing vessels have equal access to waters within the EU, however, there are a few exceptions to this rule of access as described below.

Access to fisheries is normally authorized through a fishing license. Within the RoI Exclusive Economic Zone (EEZ), fishing activity from the shore to 6 nm is only permissible for RoI registered vessels, and Northern

Ireland vessels under the Voisinage Arrangement[1] and the Northern Ireland Protocol introduced after the UK exited the European Union. A number of restrictions are in place based on byelaws set by Inland Fisheries Ireland (IFI) that control fisheries out to 6 nm. From 6 nm to 12 nm, non-RoI vessels may fish if they have acquired historical rights to do so (as noted in section 1.3.5, access to the RoI fishing waters is permitted to vessels from the United Kingdom (England, Wales, Scotland and Northern Ireland), France and Belgium under EU Regulation 1380/2013, from 6 nm to 12 nm). Outside 12 nm, international vessels are permitted to fish subject to quota allocation and other EU level restrictions including technical gear measures and effort restrictions such as days at sea.

There are two temporary exceptions to this rule of equal access, these are:

- In waters up to 12 nm from the coasts of the EU countries, access can be limited by the EU country to vessels and fisheries that traditionally fish in those waters from adjacent ports, to vessels identified under existing neighborhood relations, and to vessels related to fisheries as listed in the CFP (annex I). These restrictions generally give preferred access to vessels that traditionally fish in those waters from the adjacent ports; and

- In waters up to 100 nm from the coasts of Europe's outermost regions access can be restricted to vessels registered in the ports of these territories, and to vessels that traditionally fish in those waters.

Following completion of the Brexit transition period these agreements currently remain in place for Northern Irish vessels while the Northern Ireland Protocol is in effect and Northern Ireland remains part of the Customs Union. However, for vessels from the rest of the UK (e.g. England, Wales and Scotland), further provisions apply in relation to access to RoI waters. The only UK vessels which may continue or begin to fish within RoI waters are those which possess a specific authorisation to do so, issued by the UK Fishery Authorities. UK fishing vessels (other than from Northern Ireland) are, for the purpose of the Protocol, considered third country fishing vessels in Northern Ireland and the Republic of Ireland. Therefore, all landings in Northern Ireland and the RoI of fish by UK or third country fishing vessels must be subject to EU customs rules, where applicable, including EU customs tariffs unless exempted.

1.3.2 Gear types

The Atlas of Commercial Fisheries around Ireland presents fishing gear types used by all nationalities around the RoI (Figure 1-2). The predominant gear types recorded in the vicinity of the Project are bottom trawls (demersal otter trawl) and dredging. However, it should be noted that this data only includes vessels >15 m in length and that the potting and dredging fishery is likely to use a greater number of vessels <15 m in length (see section 1.3.5 for further information on gear types used within the Regional Commercial Fisheries Study Area).

Based on review of the data presented in the Atlas of Commercial Fisheries in Ireland in the vicinity of the Project (Gerritsen and Kelly, 2019), in 2012, bottom trawls accounted for >18 h/km^2 of international fishing effort (predominantly fishing for *Nephrops*), pelagic trawls >0.064 h/km^2 (fishing for herring), dredgers >3.4 h/km^2 (fishing for razor shells), traps >2.2 h/km^2 (whelk, crab and lobster) and nets <0.6 h/km^2 (pollack). No data was available on the fishing effort by seines.

Gear types likely to be used within the Regional Commercial Fisheries Study Area include:

- Bottom Trawls:
  - Demersal otter trawl gear is a net which is held open by otter boards or trawl doors and dragged along the bottom. Mainly used to target demersal fish species and deep-water species.

[1] The Voisinage Arrangement is an informal agreement which allows RoI and Northern Ireland vessels reciprocal access to fish in the 0 to 6 nautical mile zone of each other's territorial waters.

  - Beam trawl gear use tickler chains to startle flatfish into the net. Pulse beam trawls replace tickler chain with drag wires through which electric impulses are sent, which stimulate the fish out of the seabed and into the net. Mainly used to target demersal species.

- Pelagic Trawls:

  - Pelagic pair trawl use funnel-shaped nets that are hauled by either one or two boats (pair trawls). Pelagic boats generally fish for a single species (unlike the demersal trawls). Mainly used to target pelagic species such as herring.

- Dredges

  - The tooth bar of each dredge rakes through the sediment lifting out sessile species and the spring-loaded tooth bar swings back, allowing the dredge to clear obstacles on the seabed. The dredges are held in a series on two beams, which are fished on each side of the vessel.

- Traps:

  - Potting uses a trap, usually baited, to target crab, lobster and whelk and are often laid near or adjacent to rocky outcrops.

- Seines:

  - Seines use a very long net, with or without a bag in the centre, which are set either from the shore or from a boat for surrounding a certain area and is operated with two (long) ropes fixed to its ends (for hauling and herding the fish). Seine nets can be deployed from the shore as a beach seine, or from a boat often targeting demersal species. The type of seine used determines the type of species caught, with most targeting pelagic species but demersal seines targeting species on or close to the seabed.

- Nets:

  - Gill nets are composed of vertical panels of netting that hang from a line with regularly spaced floaters that hold the line on the surface of the water. Mainly used to target small and large pelagic species as well as demersal species.

  - Trammel nets are similar to a gill net but consist of three layers of netting. Generally used to target demersal fish.

  - Drift nets consist of a string of gillnets kept more or less vertical by floats on the upper line (headrope) and weights on the lower line (groundrope) (sometimes the groundrope is without weights), drifting with the current, in general near the surface or in mid-water. Mainly used to target schooling fish such as herring, mackerel and sardines, but can also be used to catch salmon and pelagic squid.

- Hook and line:

  - Hook and line gears are composed of fishing line spooled onto a handheld spool with one or more hooks. Bait is placed onto the hooks to attract fish. The method is primarily used to target mackerel and pollack.

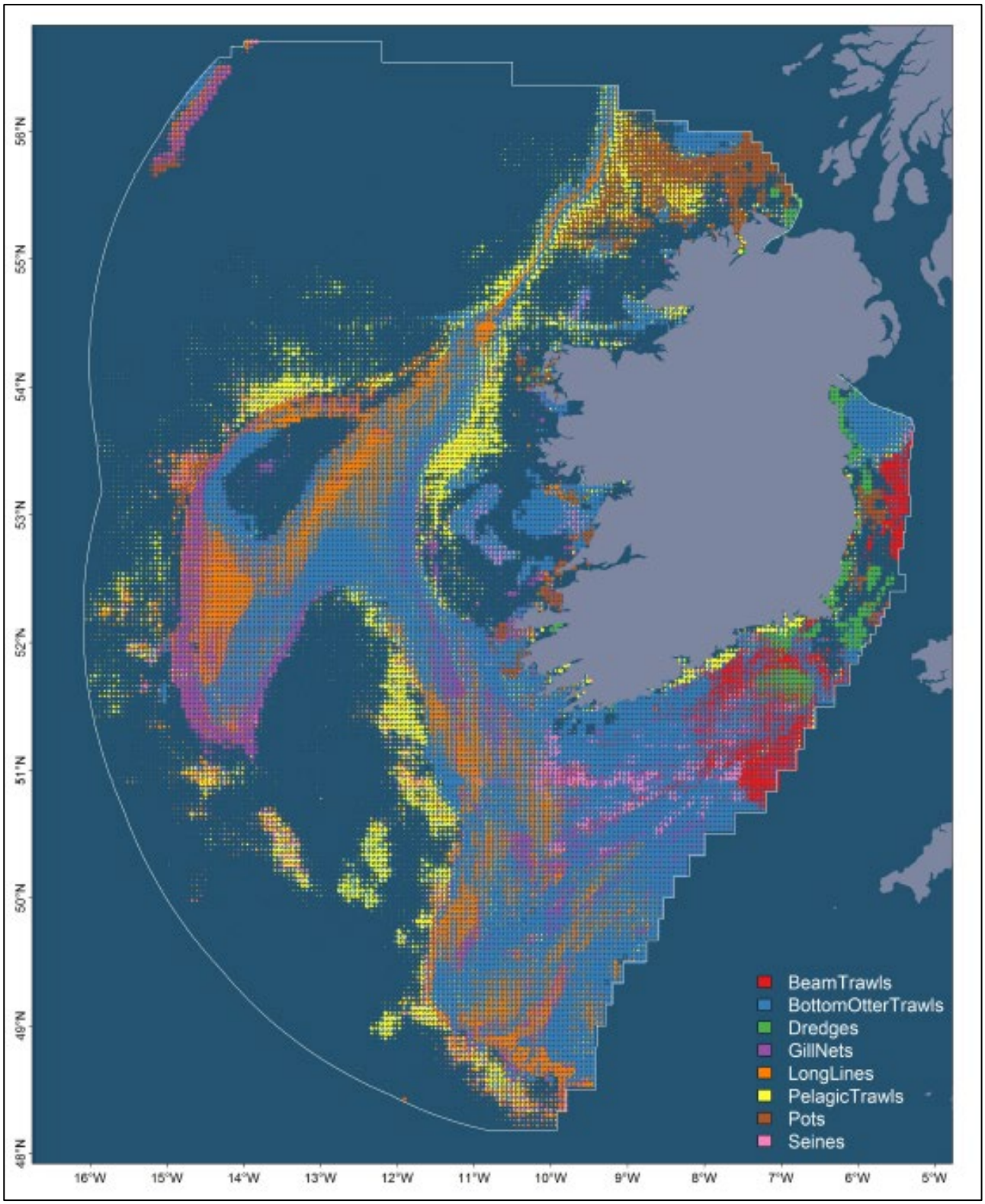


Figure 1-2: Proportions of fishing gear types around the RoI (Gerritsen and Kelly, 2019).

1.3.3 Traditional fishing grounds

This section outlines the inshore and offshore traditional fishing grounds commercially fished using the gear types identified in section 1.3.2.

For the purposes of this Commercial Fisheries Technical Report, inshore fishing grounds are defined as areas located within 6 nm of the coast. Offshore fishing grounds can be defined as areas located ≥6 nm from the coast. Traditional fishing grounds identified are only indicative and as such can only be used to infer commercial fisheries in that area.

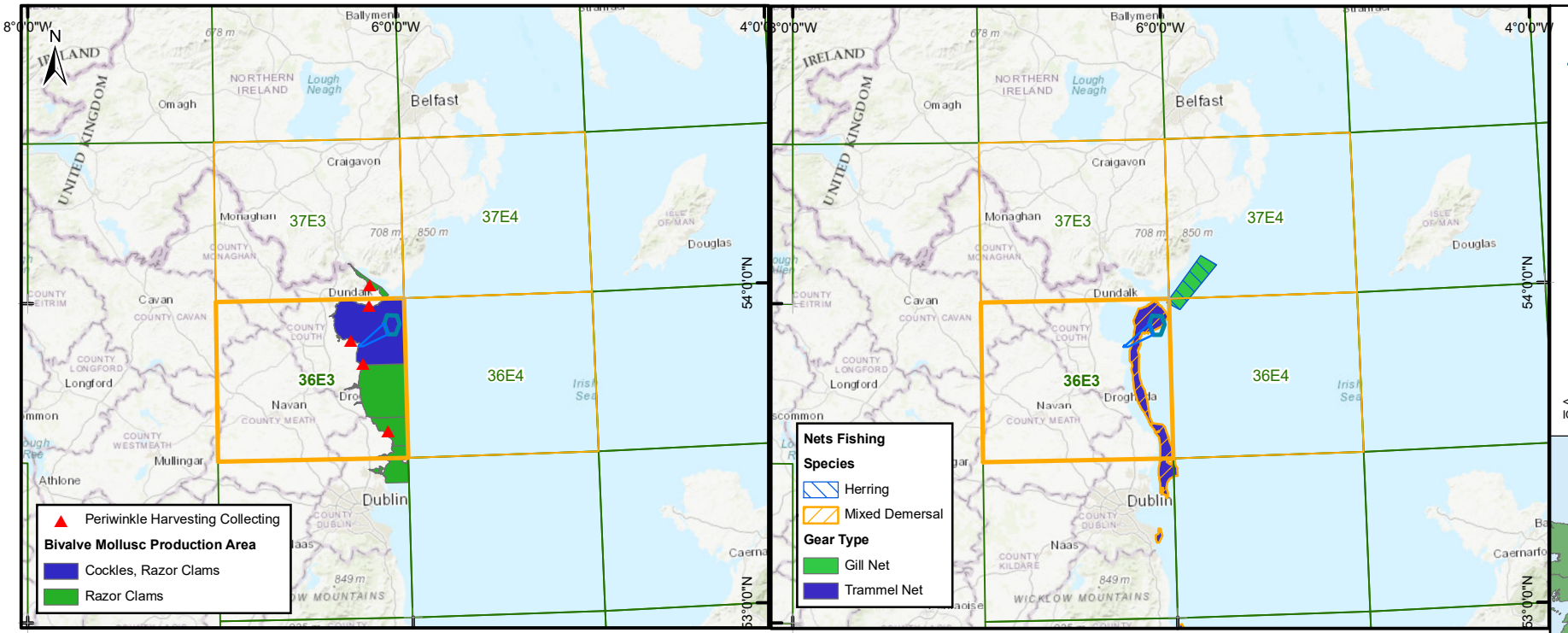
Inshore fishing grounds

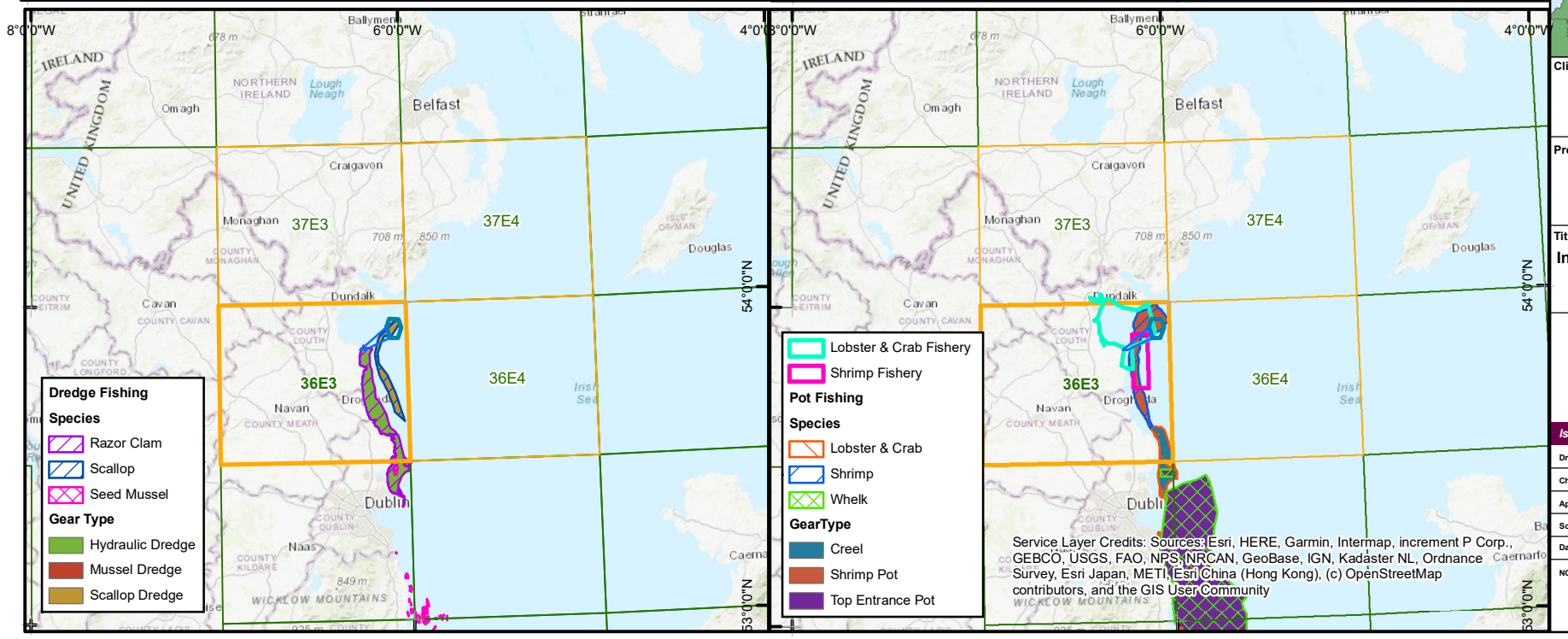
Inshore fishing grounds overlapping with the offshore wind farm area and offshore cable corridor include a bivalve mollusc production area for cockles and razor clams (the "Dundalk Bay production area"), trammel and gill net fishing for mixed demersal species, dredge fishing for razor clam, scallops and mussels, and potting for shrimp, lobster, crab and whelk (Figure 1-3). Consultation has also revealed that hook and line may also be used to target mackerel and pollack during the summer months.

The offshore wind farm area and offshore cable corridor are located within the bivalve mollusc production area, classified under the SFPA due to the high density of shellfish within Dundalk Bay (Figure 1-3). A Fisheries Natura Plan for cockle *Cerastoderma edule* in Dundalk Bay has been put into force by the Department of Agriculture, Food and the Marine, for the period 2016 to 2020, with the aim of ensuring both a sustainable fishery and the preservation of habitat within the Dundalk Bay Special Area of Conservation (SAC) and Special Protection Area (SPA). The purpose of this plan is to safeguard against over exploitation of the shellfish resource present within the bay, to ensure economic viability of the fisheries and to avoid fishing in areas with high densities of juvenile shellfish (DAFM, 2016). A series of management measures have been established across a management area covering 77.8 km^2 of intertidal sand flats, including a legal landing size of 17 mm shell width and a fishery closure implemented between November to the middle of July.

No periwinkle grounds overlap with either the offshore wind farm area or offshore cable corridor, however four periwinkle harvesting sites can be found within the Commercial Fisheries Study Area, as shown in Figure 1-3.

The offshore wind farm area and offshore cable corridor overlap with areas for netting, dredging, and potting (Figure 1-3). Netting grounds for mixed demersal species extend from Carlingford Lough to the north of the offshore wind farm area, south along the east coast of Ireland to Skerries and beyond to Howth. Dredging for scallops takes place from the offshore wind farm area south towards Skerries. Dredging for razor clams takes place from the landfall section of the offshore cable corridor south towards Howth. Potting for shrimp, lobster and crab extends from Carlingford Lough to the north of the offshore wind farm area, south along the east coast of Ireland to Skerries.



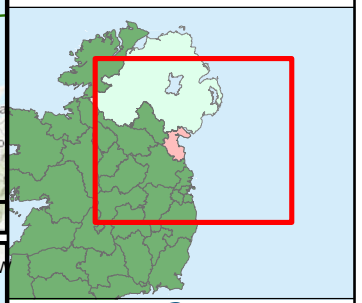


Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Legend

- Offshore Wind Farm Area
- Offshore Cable Corridor
- Commercial Fisheries Study Area
- Regional Commercial Fisheries Study Area
- ICES Statistical Rectangles

<BOL>Data Sources:</BOL> Ireland's Marine Atlas, ICES, Dunany Point Lobster & Crab



Client

ORIEL WINDFARM
OFFSHORE RENEWABLE ENERGY

Project

Oriel Wind Farm Project

Title

Figure 1-3
Inshore fishing grounds

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Offshore fishing grounds

Offshore fishing grounds in the vicinity of the Project include the Irish Sea prawn grounds (Figure 1-4) and areas fished by mobile bottom, mobile seine, mobile other and passive gear types (Figure 1-5). It is important to note that the VMS data does not delineate between whether a vessel is fishing, steaming or inactive, however AIS data for 2019 and 2022, which records vessel movement (presented in Appendix 13-1: Navigation Risk Assessment), suggest that vessels are steaming to and from offshore grounds, across the offshore wind farm area.

The fishing methods presented in Figure 1-5 have been divided into four gear type categories, as follows:

- Bottom gear types (e.g. bottom trawls and dredgers);
- Seine gear types (e.g. pelagic and demersal seines);
- Other gear types (most likely to include pelagic trawls and nets); and
- Passive gear types (e.g. pots, creel, trammel and gill nets).

In addition, data are presented for all gear types (including all the gear types mentioned above) in Figure 1-6.

The Irish Sea Prawn Grounds are largely located beyond the Commercial Fisheries Study Area. cover most of the northwest Irish Sea but are largely located within the Regional Commercial Fisheries Study area but are out with the Commercial Fisheries Study Area and beyond the boundary of the Project and are likely to be associated with habitat preferred by *Nephrops*, such as sandy muddy sediments (see chapter 8: Benthic Subtidal and Intertidal Ecology).

Bottom gear fishing effort has been recorded within the southeast of the offshore wind farm area and within the centre of the offshore cable corridor (Figure 1-5). Effort observed within both the offshore wind farm area and offshore cable corridor amounts to 0-50 hours per year, however, this effort is very limited and sporadically located across the Commercial Fisheries Study Area. Further effort can be seen in ICES rectangle 37E4 and there is increased effort (up to 87-267 hours per year) at locations within in 36E4 and the rectangle to the south of 36E4. Furthermore, data released on Irelands Marine Atlas between 2014 to 2018, for beam trawl effort indicated that there was low to no fishing effort within the Commercial Fisheries Study Area, increased effort can be observed south of 36E3 and east of Dublin within 35E4. Demersal otter trawl can be observed to the south and east of the offshore wind farm area, with increasing effort observed within 36E4.

Seine gear fishing effort has been recorded within the southeast of the offshore wind farm area and within the centre of the offshore cable corridor (Figure 1-5). Effort observed within both the offshore wind farm area and offshore cable corridor amounts to 0 to 10 hours per year, with fishing effort density increasing south and east of the offshore wind farm area and offshore cable corridor. Fishing effort has also been recorded along the southern boundaries of the offshore wind farm area and offshore cable corridor. Nearly the entire ICES rectangle 36E4, to the east of 36E3, can be seen to have seine fishing effort of up to 0 to10 hours per year. Conversely, data from Ireland's Marine Atlas indicates less seine fishing effort within 36E3, and within 36E4. However, fishing effort observed within 36E4 clusters from the centre and extends southwest within the ICES rectangle.

Other gear fishing (i.e. most likely to include pelagic trawls and nets) effort has been recorded within the southeast of the offshore wind farm area and within the centre of the offshore cable corridor (Figure 1-5). Effort observed within both the offshore wind farm area and offshore cable corridor amounts to 0 to10 hours per year. Fishing effort has also been recorded along the southern boundaries of the offshore wind farm area and offshore cable corridor. Other gear fishing effort has been recorded across the entire adjacent ICES rectangle 36E4. Fishing effort of 10 to150 hours per year has been recorded in 37E4 and in the ICES rectangle to the south of 36E3. Similarly, data from Ireland's Marine Atlas indicates no fishing effort between 2014 to 2018 for long line and gill net fishing within both the regional commercial fishing study and the commercial fishing study area. Limited pelagic trawl effort can be observed to the south and east of the offshore wind farm area, increasing with greater distance to the southeast into 36E4.

Passive gear fishing effort has been recorded within the southeast of the offshore wind farm area and within the centre of the offshore cable corridor (Figure 1-5). Effort observed within both the offshore wind farm area and offshore cable corridor amounts to 0 to 10 hours per year. Fishing effort has also been recorded along the southern boundaries of the offshore wind farm area and offshore cable corridor. Fishing effort of 0 to10 hours per year has been recorded in 36E4. Potting effort data from Ireland's Marine Atlas supports the effort identified within Figure 1-5, indicating limited potting effort within the offshore wind farm area and the offshore cable corridor.

Data for all gear types combined are shown in Figure 1-6. Fishing effort within Dundalk Bay, to the west of the offshore wind farm area, is limited compared with that for the wider Irish Sea, east of the offshore wind farm area. Fishing effort recorded within and along the southern boundaries of the offshore wind farm area and offshore cable corridor is up to 50 to 200 hours per year (Figure 1-6). Adjacent ICES rectangles (i.e. 36E4 and to the south of 36E3 and 36E4) show a greater density of fishing effort with examples of higher fishing effort (i.e. up to 200-1,000 and 1,000-4,000 hours per year; Figure 1-6).

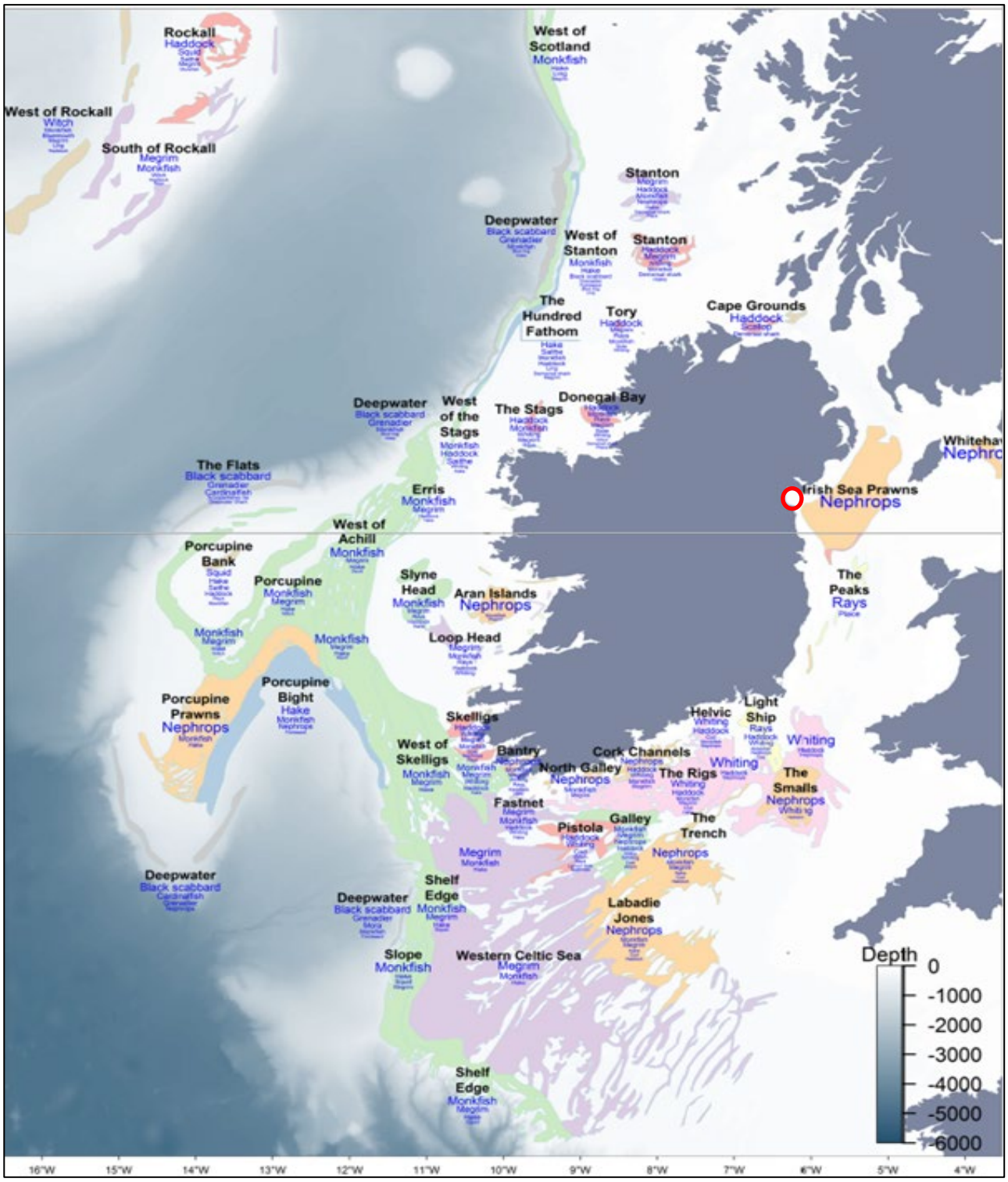
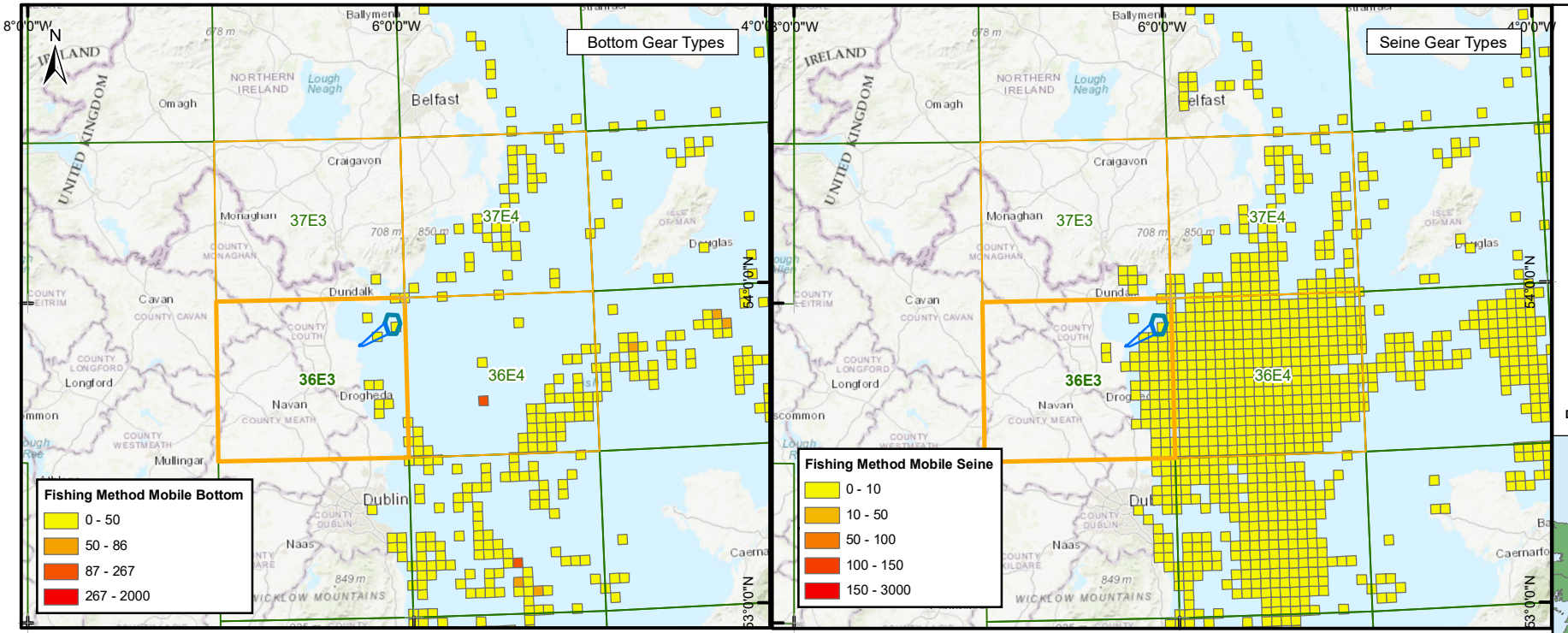
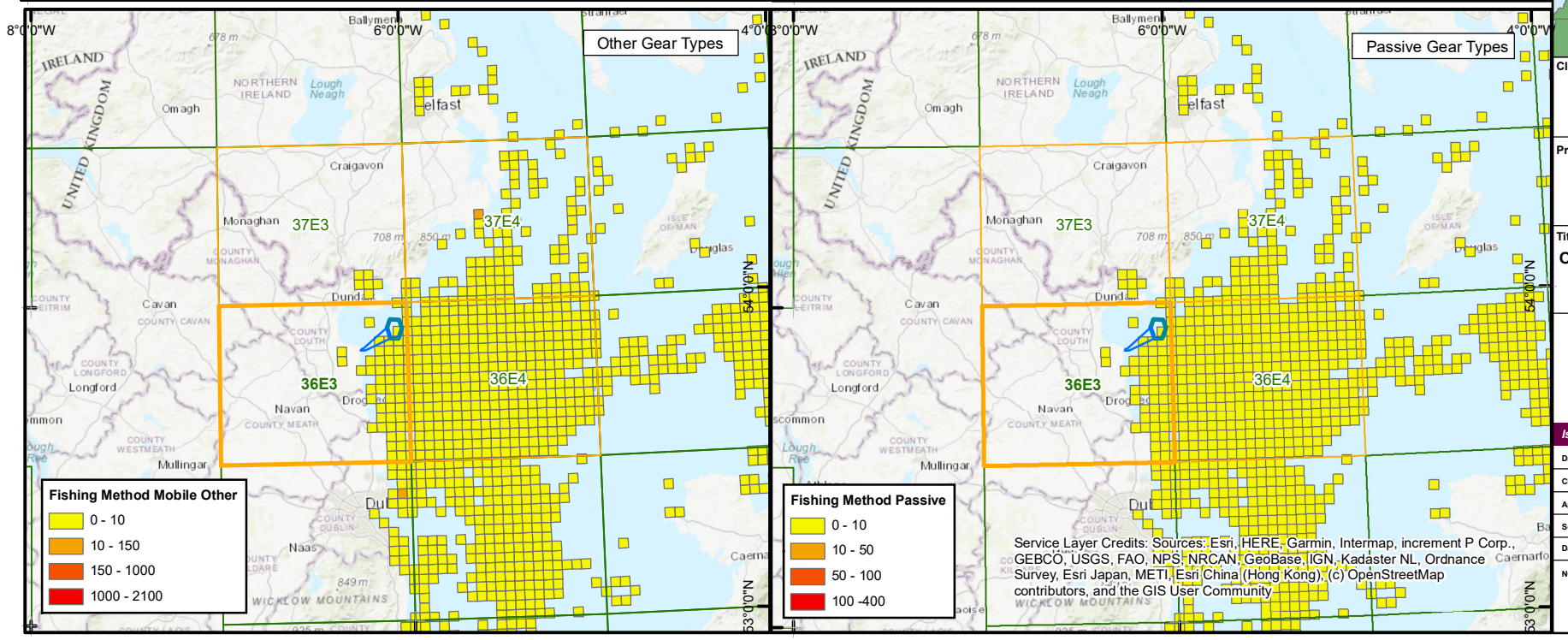


Figure 1-4: Indicative commercial fishing grounds. Red circle indicates the location of the Project (Gerritsen and Kelly, 2019).





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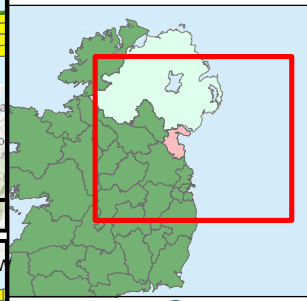
Legend

- Offshore Wind Farm Area
- Offshore Cable Corridor
- Commercial Fisheries Study Area
- Regional Commercial Fisheries Study Area
- ICES Statistical Rectangles

Data Sources: Ireland's Marine Atlas, ICES



Client

ORIEL WINDFARM
OFFSHORE RENEWABLE ENERGY

Project

Oriel Wind Farm Project

Title

Figure 1-5
Offshore fishing grounds

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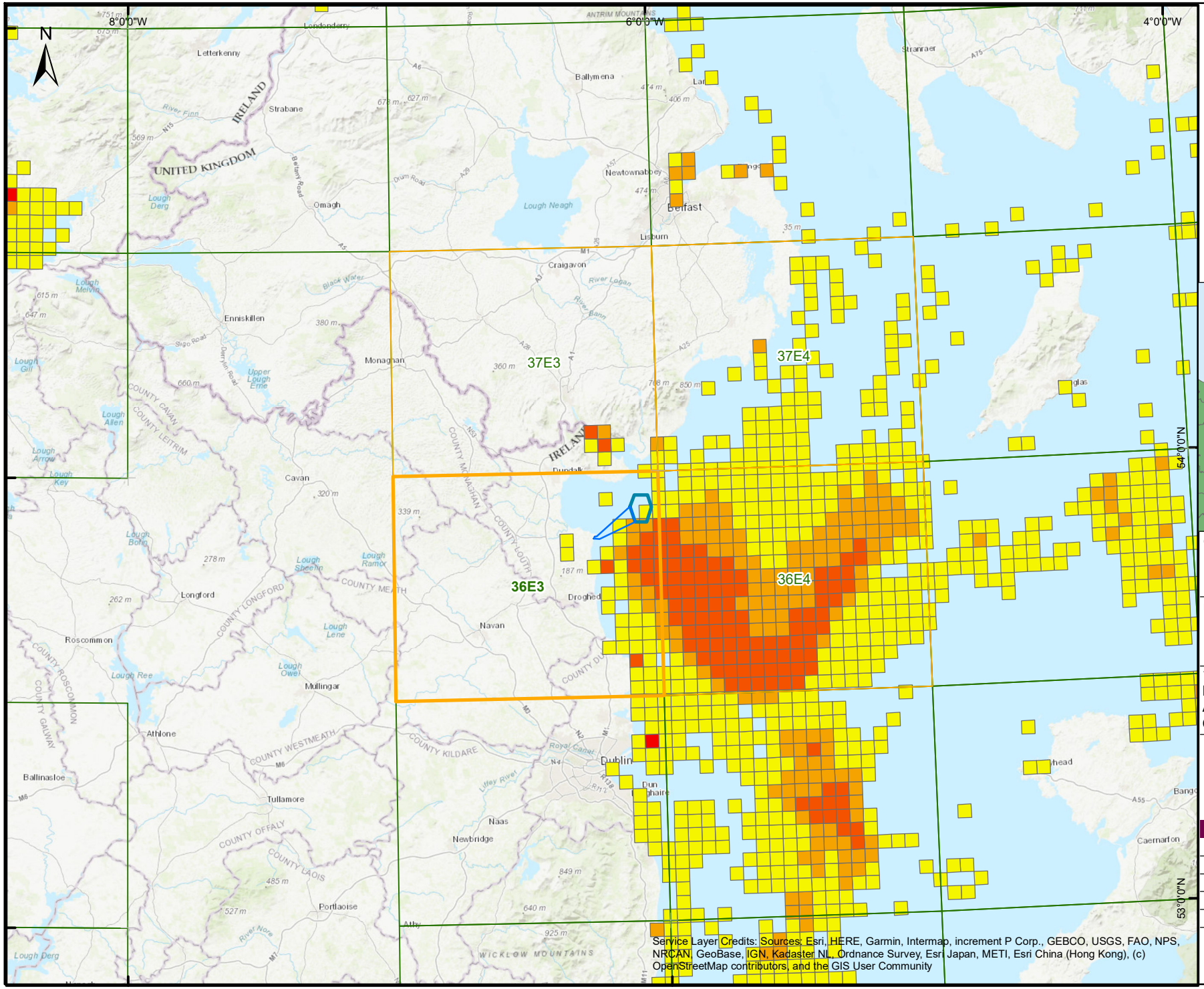


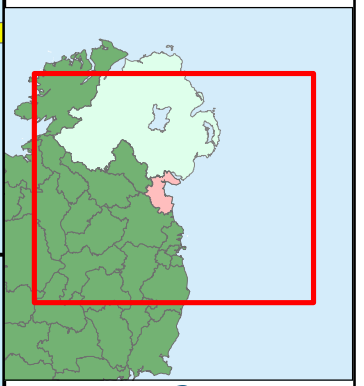
Legend

- Offshore Wind Farm Area
- Offshore Cable Corridor Commercial
- Fisheries Study Area
- Regional Commercial Fisheries Study Area
- ICES Statistical Rectangles

All Gears Types

- 0 - 50
- 50 - 200
- 200 - 1000
- 1000 - 4000

Data Sources: Client, ICES



Client

ORIEL WINDFARM
OFFSHORE RENEWABLE ENERGY

Project

Oriel Wind Farm Project

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Figure 1-6
All Gear Types -
Offshore fishing grounds

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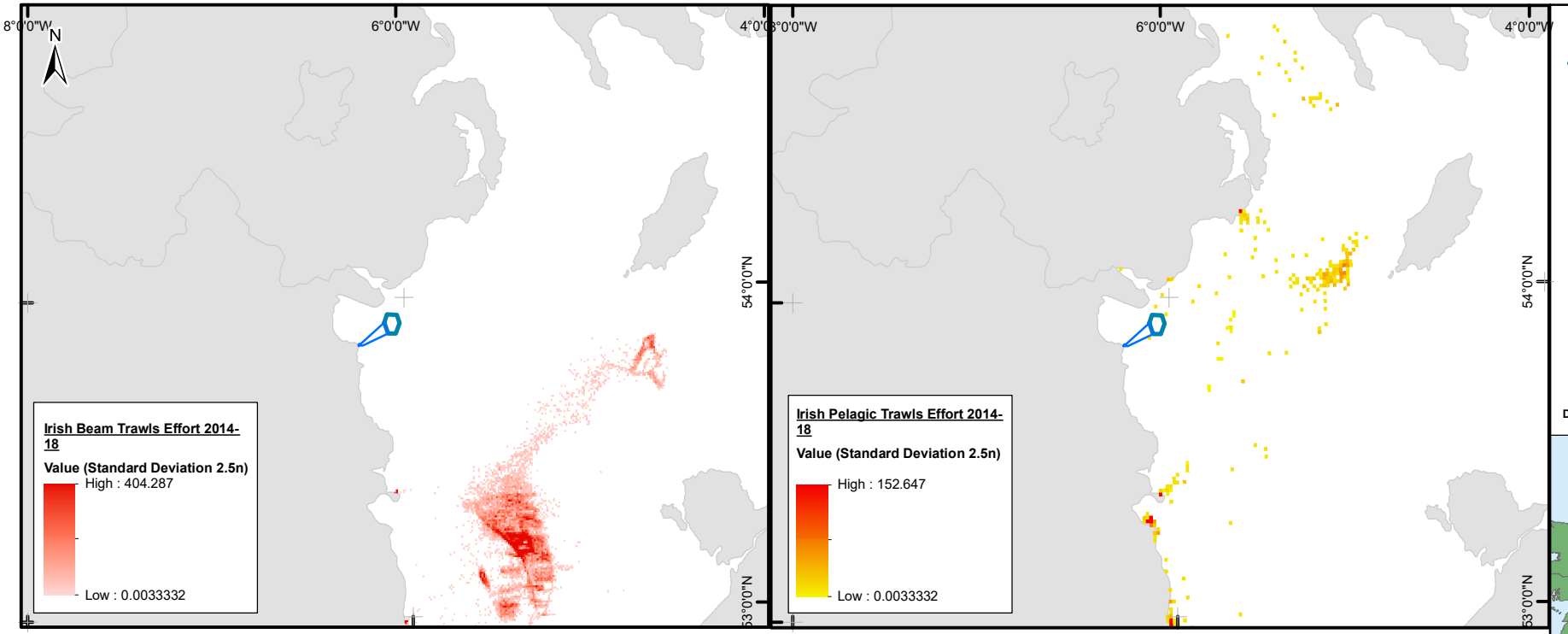
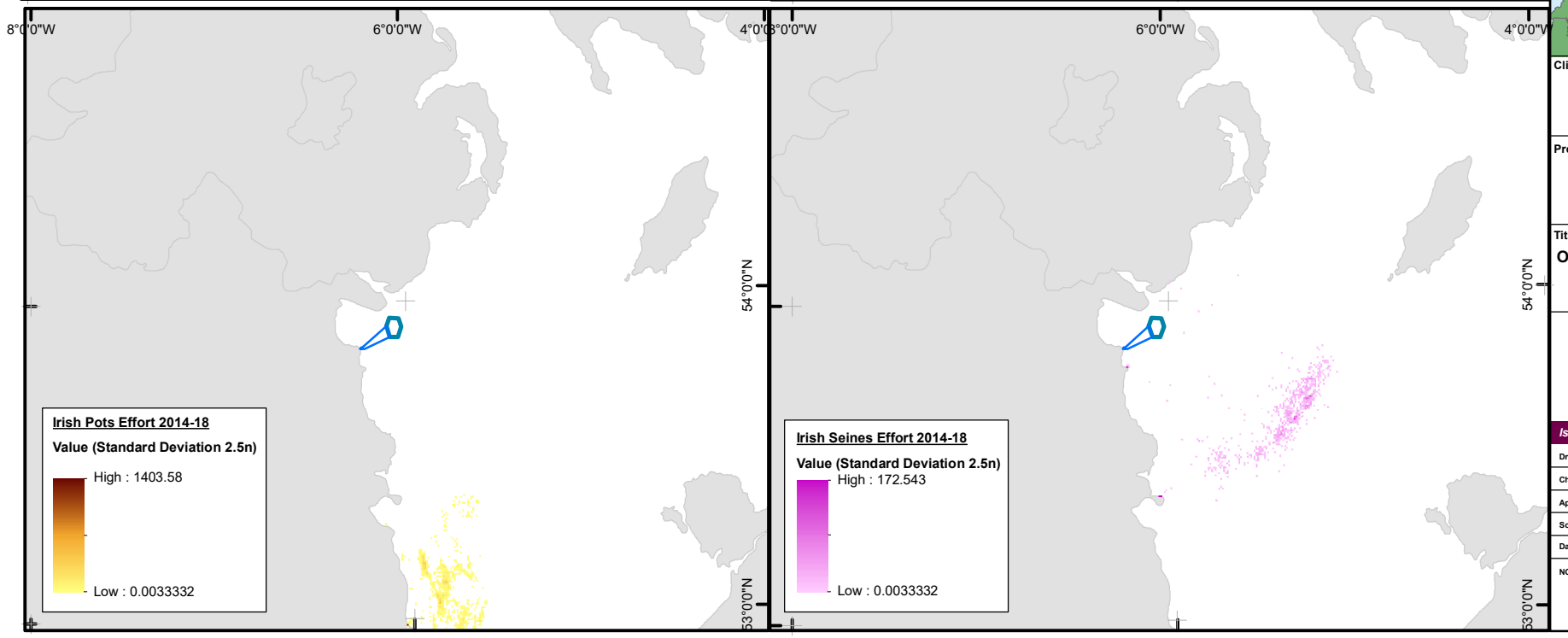
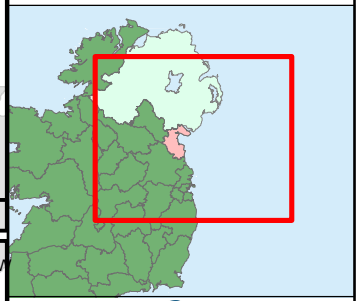




Legend

- Offshore Wind Farm Area
- Offshore Cable Corridor

Data Sources: Ireland's Marine Atlas, ICES



Client

ORIEL WINDFARM
OFFSHORE RENEWABLE ENERGY

Project

Oriel Wind Farm Project

Title

Figure 1-7
Offshore Fishing Effort

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1.3.4 Commercially important species

Commercially important species are those fish and shellfish species specifically targeted, caught and sold for profit. A review of the European and UK landings data indicated that fish targeted within the Regional Commercial Fisheries Study Area include shellfish, pelagic and demersal species (section 0; EU DCF, 2017; MMO, 2019). Many of these species are likely to be associated with the underlying sediment and hydrodynamic regime of the area.

Commercially important species within the vicinity of the offshore wind farm area include the Dublin Bay prawn *Nephrops norvegicus* (also known as *Nephrops* or Norway lobster; hereafter referred to as "*Nephrops"*), brown crab *Cancer pagurus* and velvet crab *Necora puber*, sole *Solea solea*, witch *Glyptocephalus cynoglossus* and dogfish *Squalus acanthias*, often associated with muddy sediments. Communities found further offshore within sandier sediments include a variety of flatfish *Pleuronectiformes* spp., gurnard *Chelidonichthys cuculus*, whiting *Merlangius merlangus* and dogfish. Coarser sediments are dominated by lemon sole *Microstomus kitt*, angler fish *Lophius budegassa*, poor cod *Trisopterus minutus* and dogfish (Roden and Ludgate, 2003). The top ten commercially fished species include whiting, mackerel *Scombridae* spp., herring *Clupea harengus*, edible cockles *Cardiidae* spp., *Nephrops* and queen scallops *Aequipecten operculari* (Oriel Windfarm Ltd, 2007).

As indicated in section 0, the offshore wind farm area and offshore cable corridor are located at the western extent of the Irish Sea Prawn Grounds, named so for the abundance of *Nephrops* in the area. For further information on the ecology of *Nephrops* and other fauna, see chapter 9: Fish and Shellfish Ecology.

Additionally, the Commercial Fisheries Study Area has been recognised as a nursery ground for angler fish, lemon sole, plaice, whiting, cod, haddock *Melanogrammus aeglefinus*, herring, mackerel, spotted ray *Raja montagui*, spurdog *Squalus* spp. and thornback ray *Raja clavata* and as a known spawning area for lemon sole, plaice, sandeel *Ammodytes americanus*, sole, whiting, cod, ling *Molva*, mackerel, herring and sprat *Sprattus sprattus* (chapter 9: Fish and Shellfish Ecology).

The following sections describe the shellfish, demersal and pelagic fish species, elasmobranchs and migratory fish targeted by commercial fishing fleets (by gear type and seasonality).

Shellfish

Shellfish likely to be targeted within the Project boundary include *Nephrops,* cockles, razor clams *Siliqua patula*, brown crab and European lobsters *Homarus Gammarus* (Gerritsen and Kelly, 2019). Shrimp and prawns may also be targeted (D. Mulroy, personal communication, 2021)

Pot fishing within the Regional Commercial Fisheries Study Area target lobster and crab between March and September. Lobsters and crabs typically inhabit rocky reef and rough ground, sheltering in crevices between rocks and boulders. *Nephrops* pots are usually set between September to December. *Nephrops* are usually limited to muddy habitats. Dredging for scallop occurs all year round. Scallop (including king scallop *Pecten maximus* and queen scallop *Aequipecten opercularis*) are most common in water depths of 20 to 70 m, in areas of clean firm sand and fine gravel exposed to water currents, which provide good feeding conditions (Gerritsen and Kelly, 2019).

Periwinkle grounds are located within the Commercial Fisheries Study area, although these do not overlap with the offshore wind farm area or offshore cable corridor. The offshore wind farm area and offshore cable corridor is located within a bivalve mollusc production area, where razor clams and edible cockles are targeted (SFPA, 2019; Figure 1-3).

Demersal fish species

Consultation with IFI has indicated the following demersal species are known to be commercially caught within the Dundalk Area: plaice, cod, codling (juvenile cod), ling, European flounder, pollock *Pollachius* spp., whiting and gurnard (Table 1-1). Plaice, cod, ling and whiting have known spawning and nursery grounds that overlap with the Commercial Fisheries Study Area and have both commercial and conservation value (chapter 9: Fish and Shellfish Ecology). A summary of the ecology for each species is provided below:

- Plaice are commonly found within the intertidal regions to depths of 8 m between January and March. The offshore wind farm area and offshore cable corridor overlap with a low-high intensity spawning ground and low intensity nursery ground (see chapter 9: Fish and Shellfish Ecology);

- Cod are commonly found from the shoreline to depths of 600 m from January through to April. The offshore wind farm area and offshore cable corridor overlap with a low intensity spawning ground and high intensity nursery area. Additionally, a high intensity spawning area can be found to the south of the offshore wind farm area and offshore cable corridor (see chapter 9: Fish and Shellfish Ecology);

- Ling spawn from February through to May and share a similar ecology to cod. The offshore wind farm area and offshore cable corridor overlap with a low intensity spawning ground (see chapter 9: Fish and Shellfish Ecology); and

- Whiting is likely to be present at depths of 20 to 100 m between February and June. The offshore wind farm area and offshore cable corridor overlaps with a low intensity spawning ground and a high intensity nursery area (see chapter 9: Fish and Shellfish Ecology).

Demersal species are likely to be caught in beam and demersal seine trawls, through dredging, by drift and fixed nets, gears using hooks, pots, and traps and by other mobile gear. Net fishing within the Regional Commercial Fisheries Study Area includes trammel netting for mixed demersal species during the period between March and September.

Pelagic fish species

Consultation with IFI has indicated sprat, mackerel, and wrasse *Labridae* spp as commercially important species (Table 1-1). Mackerel has known spawning and nursery areas that overlap with the Project (see chapter 9: Fish and Shellfish Ecology). Mackerel are commonly found throughout the water column from March through to July.

These pelagic species are likely to be caught within beam and demersal seine trawls, through dredging, by drift and fixed nets, gears using hooks (e.g. hand lining), mobile and passive gear, pelagic seine and through pots and traps, with an increase in catch likely to occur during the spawning seasons.

Elasmobranchs (Cartilaginous) fish species

Consultation with IFI has identified dogfish, tope and spurdog as commercially important species (Table 1-1). Tope and spurdog have known nursery grounds that overlap with the Project. Both tope and spurdog are a viviparous[2] species. They reproduce all year round and can be found throughout the water column.

These cartilaginous fish species are likely to be caught within beam and demersal seine trawls, through dredging, by drift and fixed nets and gears using hooks, with an increase in catch likely to occur during the spawning seasons.

Migratory fish species

The Rivers Dee, Glyde, Fane, Castletown and Flurry, which drain into Dundalk Bay to the west of the offshore wind farm area, contain a number of migratory species, including Atlantic salmon, sea trout, European eel and sea lamprey. These migratory species have been identified as of commercial and conservation importance. Atlantic salmon is known to return to natal rivers in February through to August. Sea trout share similar ecology but are known to spawn in the winter from October to January. The European eel is known to migrate through Irish waters in August through to November. The sea lamprey is known to spawn between May and June and migration to natal rivers can be expected before these months. All migratory species are expected to transit the Irish Sea along the eastern coast of Ireland and through the North Channel (chapter 9: Fish and Shellfish Ecology).

[2] Bringing forth live young which have developed inside the body of the parent.

Migratory fish species, identified through consultation with the IFI, are likely to be caught using demersal seine trawls, drift and fixed nets and other passive gear, with an increase in catch likely to occur during migration periods to and from rivers (Table 1-1).

1.3.5 Fisheries activity

This section firstly provides a broad overview of the national fishing activity around Ireland, followed by a detailed analysis of landing statistics for the Regional Commercial Fisheries Study Area and the Commercial Fisheries Study Area.

National Fishing Activity

Republic of Ireland

The spatial distribution of commercial fishing vessel nationalities by all gears combined is presented in Figure 1-8. The Atlas of Commercial Fishing around Ireland indicates that the majority of fishing effort by RoI vessels ≥12 m takes place within the Irish EEZ (77%). However, most of the fishing effort inside the Irish EEZ is carried out by foreign vessels; the RoI is responsible for only 55% of effort from vessels ≥12 m inside the EEZ (note that the proportion of Irish effort would likely be higher if smaller vessels <12 m were included). The RoI effort consists mainly of demersal otter trawlers. Spain accounts for 14% of the effort (mainly demersal otter trawlers and long liners), fishing to the south and west of RoI. France, fishing to the south and west of the RoI, and the UK, fishing in the northeast, south and west of Ireland, account for 18% and 21% of the effort, respectively (dominated by demersal otter trawlers for both countries). Belgium accounts for 1% of the effort (nearly all beam trawlers). The remaining 3% effort is carried out mainly by the Netherlands, Germany and Denmark and is dominated by pelagic trawlers. Republic of Ireland is responsible for 45% of fishing effort (>12m) inside the Irish EEZ.

In 2021, the RoI fishing fleet registered 1,993 vessels (BIM, 2021). The fleet is characterised by six types of fishing vessels, these include 1,386 polyvalent general vessels[3] and 331 potting vessels, with 276 vessels constituting specific, aquaculture, pelagic and beamer vessels. These six types of vessels include small inshore vessels that typically fish up to 6 nm from the Irish coast, as well as medium to large offshore vessels, which mainly target whitefish, pelagic fish and bivalve molluscs (BIM, 2021).

A total of 8,705 people were directly employed in the Irish seafood sector in 2021. A breakdown of this number indicates that 2,848 people were employed in fisheries, 1,984 in the aquaculture sector, and 3,873 in the processing branch. Employment in the Irish seafood sector is largely concentrated around its coastal communities (BIM, 2021).

Northern Ireland

The Northern Ireland fishing fleet mostly target shellfish using static gears (i.e. pots and fixed nets), with an increasing number using single-rig *Nephrops* bottom trawls in traditional *Nephrops* grounds in the Irish Sea. Around 16 vessels were identified as actively using mostly single-rig *Nephrops* gears in 2004, with around half of these boats also using pots and scallop dredges in addition at times throughout the year. Given high levels of fishing vessel congestion and political uncertainty in the *Nephrops* sector, operators are increasingly diversifying into the growing crab fishery (Ungfors *et al.,* 2013) and may also undertake hand lining for mackerel and pollack during the summer (David Mulroy, personal communication.; 2021).

The total number of registered fishing vessels (including those under 10 m in length) increased from 349 in 2015 to 351 in 2016, however, following 2016 a decrease in vessel numbers was observed, to 338 in 2017, 332 in 2018 and 326 in 2019, a reduction of 7.1% from 2016 to 2019 (MMO, 2019). The reduction in total fleet size was mostly represented by vessels 10 m and under.

[3] Vessels using more than one gear type, with a combination of passive and active gears, none of which exceed more than 50% of the time at sea during the year.

There are an estimated 854 fishermen working 332 vessels in Northern Ireland, operating out of Belfast, Kilkeel, Ardglass and Portavogie (MMO, 2018). The number of fishermen has increased by 37% from 2008 to 2018. Of the 854 fishermen, 686 are registered as full time and 168 are registered as part-time.

Consultation with the fishing industry has identified that fishing by Northern Ireland vessels is undertaken throughout the year with seasonal changes occurring depending on stock movements, weather, marketing requirements and on the species targeted. The heaviest effort is often in the summer months between May and September, but may continue between September and March for vessels targeting prawn. Hook and line gear targeting mackerel and pollack may also be used during the summer and autumn. The period between mid-November and mid-December can also be productive due to increases in market demand.

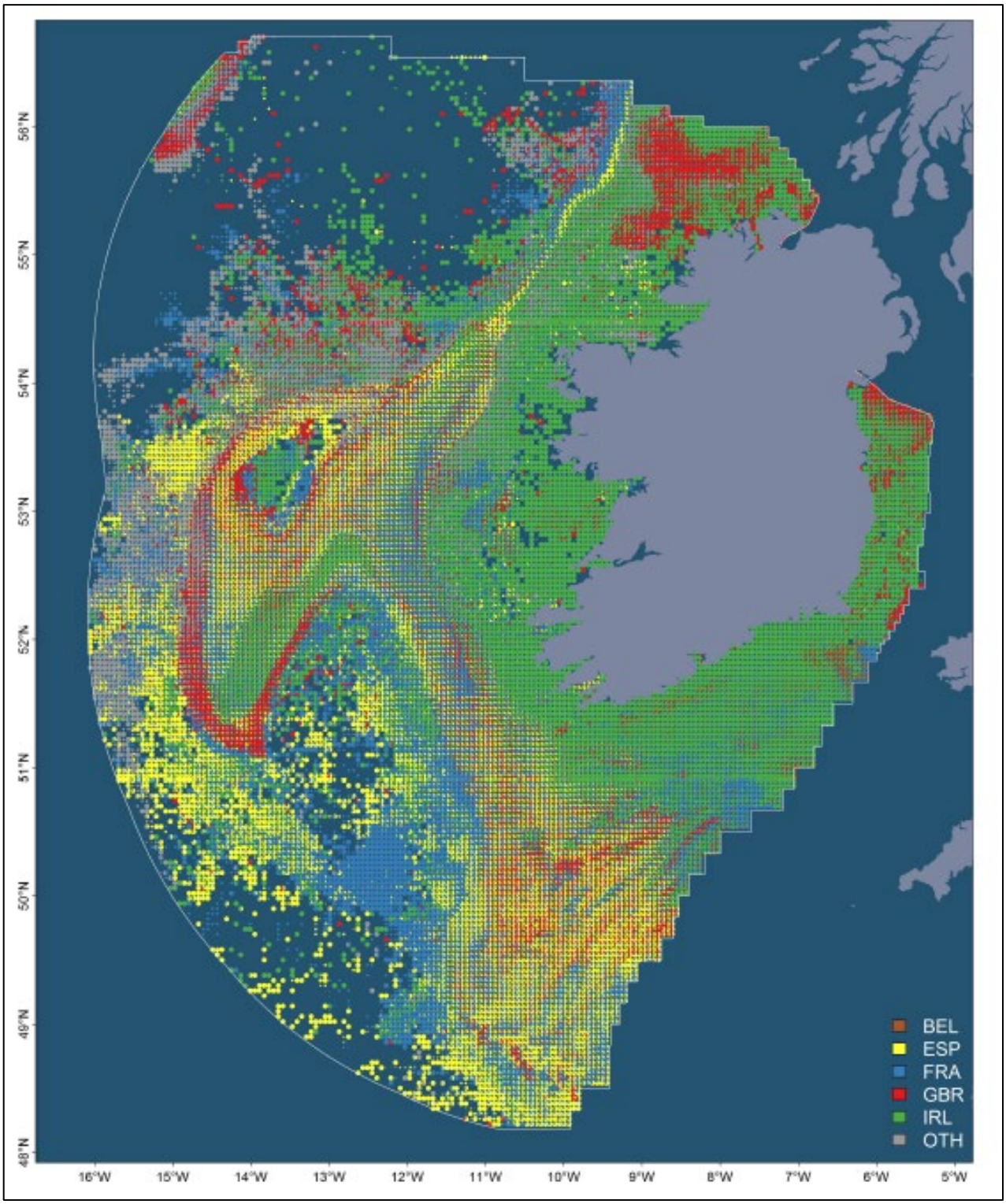

Figure 1-8: Commercial fishing vessel nationality (Gerritsen and Kelly, 2019).

Regional Commercial Fisheries Study Area

As described in section 1.2, the Regional Commercial Fisheries Study Area is comprised of ICES rectangles 36E3, 37E3, 36E4 and 37E4.

The average annual landed weight (tonnes) of all species taken by EU nations by vessel registered country is presented in Figure 1-9. The highest quantity of landed species (tonnes) is taken by RoI registered vessels, followed by Northern Ireland registered vessels, with smaller amounts landed by Scotland, Belgium, Isle of Man and England registered vessels.

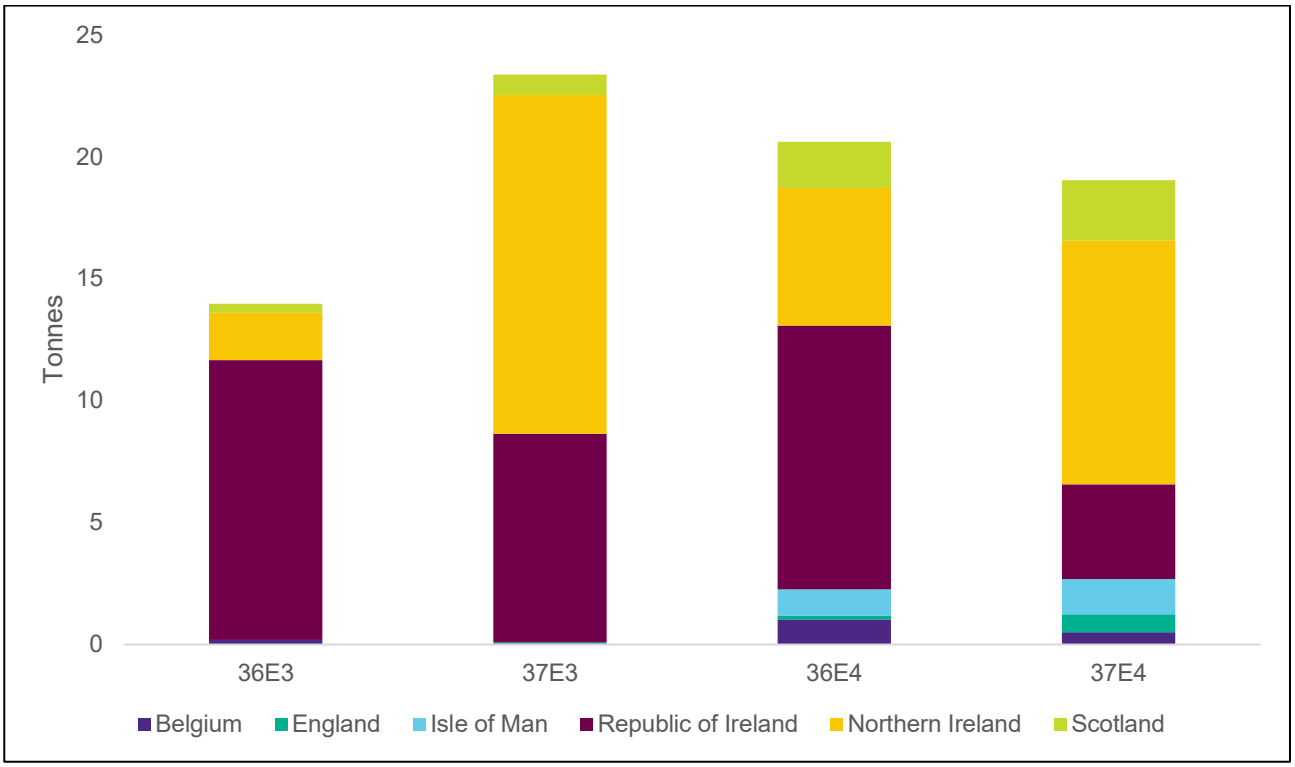

Figure 1-9: Average annual landed weight (tonnes) of all species landed by all EU member states from the Regional Commercial Fisheries Study Area by vessel registered country (based on five-years' data from 2012 to 2016) (Data source: EU DCF database, 2017)[4].

The annual average landed weight (tonnes) of all species taken by EU nations by gear type is presented in Figure 1-10. The highest quantity of catch (tonnes) is taken by pelagic trawls, followed by dredgers and then in smaller quantities by gill nets, pots and bottom trawls. Beam trawls, trammel nets and longlines make up a negligible proportion of the landings within the Regional Commercial Fisheries Study Area.

[4] It is noted that only a small proportion of ICES rectangle 37E3 is sea but that a relatively high catch volume has been recorded. This may be due to the presence of Kilkeel port within this rectangle or the data may have been misreported.

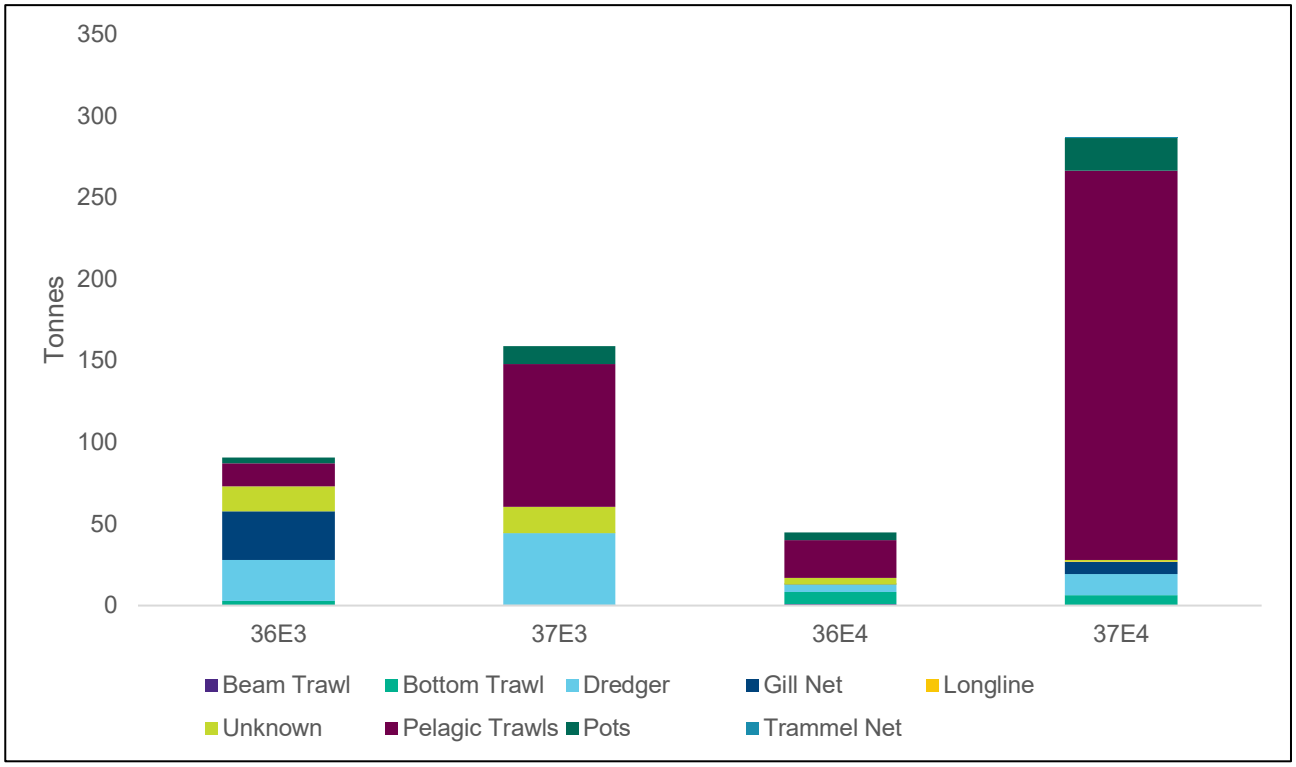

Figure 1-10: Average annual landed weight (tonnes) of all species landed by all EU member states from the Regional Commercial Fisheries Study Area by gear type (based on five-years' data from 2012 to 2016) (Data source: EU DCF database, 2017).

Average annual landings from the Regional Commercial Fisheries Study Area are 261.95 T for all EU member states (based on five-years' data from 2012 to 2016; EU DCF database, 2017). The proportion of landings by ICES rectangle and species is shown in Figure 1-11.

Sword razor shell, edible cockle and razor clams dominate the landings in 36E3, accounting for 60% of the average annual landings. Rectangle 37E3 is dominated by herring, accounting for 44% of landings, followed by blue mussels (22%). *Nephrops* and herring dominate the landings within 36E4, accounting for 65% of the species landed. Together herring, *Nephrops,* blue mussel and brown crab account for 80% of the landings from 37E4.

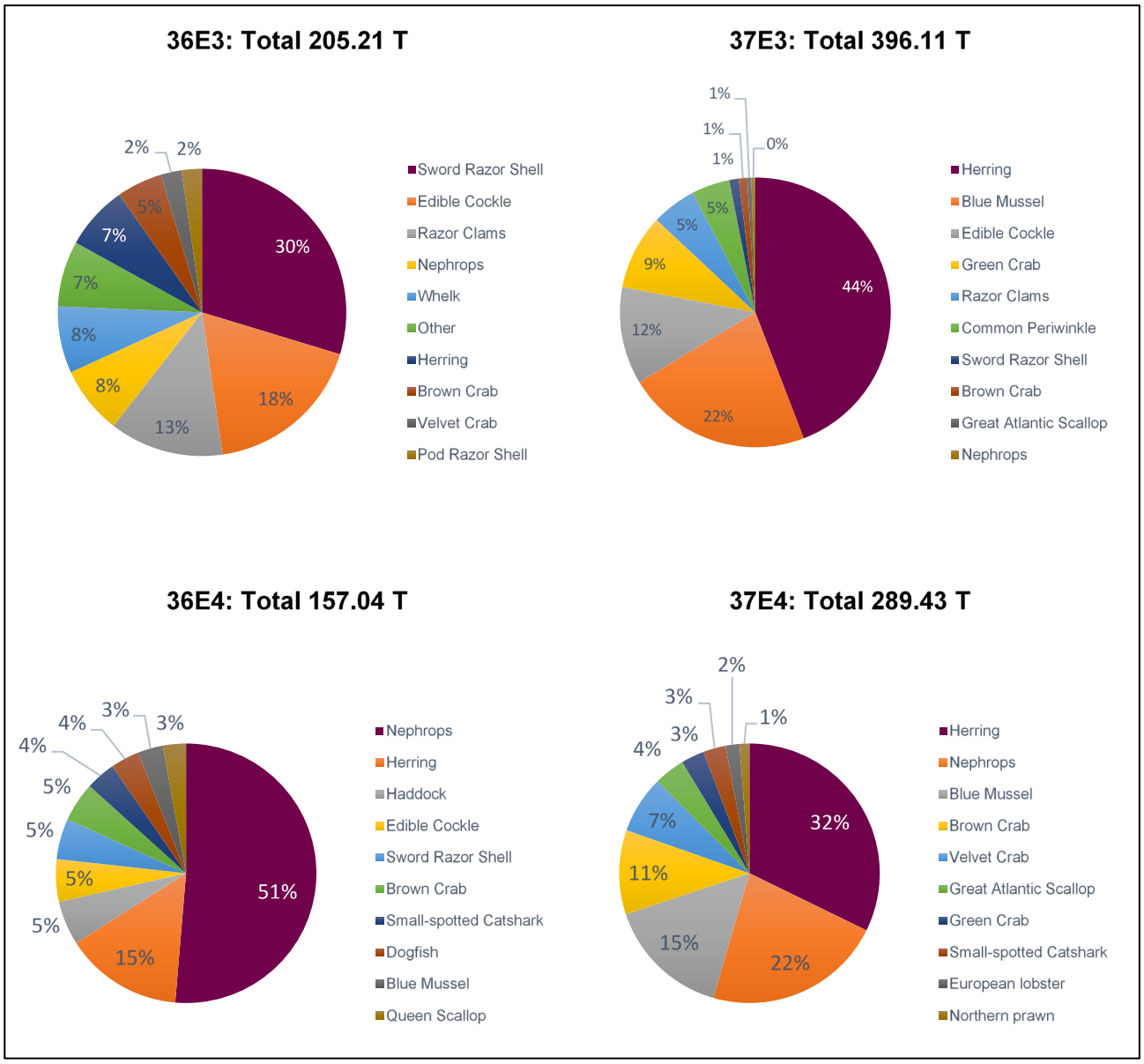

Figure 1-11: Average annual proportion of landings value by species and ICES rectangle for all EU member states combined (based on five-years' data from 2012 to 2016) (Data source: EU DCF database, 2017).

Commercial Fisheries Study Area

As described in section 1.2, the Commercial Fisheries Study Area is comprised of ICES rectangle 36E3, in which the offshore wind farm area and offshore cable corridor are located. The offshore wind farm area has an area of 27.7 km^2 and cable corridor area of 25.4 km^2, totalling approximately 53.1 km^2, representing approximately 6% of the Commercial Fisheries Study Area (858 km^2).

Landings by weight from 36E3 are dominated by RoI registered vessels, which is to be expected given the more inshore location of this ICES rectangle, followed by landings from Northern Ireland (Figure 1-9). Scotland and Belgium account for a negligible proportion of landings within 36E3. Figure 1-10 indicates that landings by weight from 36E3 are split between dredgers and gill nets, followed by pelagic trawlers, pots, bottom trawls and a negligible amount by beam trawl.

The following sections set out the fisheries activity by country, within the Commercial Fisheries Study Area, providing information on the fishing vessel fleets, commercial fishing ports and an analysis of the landing

trends and key species. Countries taken forward for further analysis include RoI and Northern Ireland, based on proportion of landings data illustrated in section 0.

Republic of Ireland

Ports and vessel fleets

Port Oriel at Clogherhead (hereafter referred to as 'Clogherhead') represents the closest fishing port to the offshore wind farm area and offshore cable corridor with vessels from Dundalk, Greenore, Annagassan and Giles Quay also operating within the Commercial Fisheries Study Area.

Consultation with the Dundalk Pilot advised that cockle day boats operate inside port limits, likely to be within Dundalk Bay, with up to three lobster boats operating out of the port. Furthermore, consultation with Clogher Head RLNI indicated that fishing activities within the Commercial Fisheries Study Area are likely to target *Nephrops,* razor clams, lobsters, and crabs.

Landings trends and key species

Within the Commercial Fisheries Study Area, landings between 2012 and 2016 remained relatively stable, with an average annual landing by RoI registered vessels of 11 tonnes (Figure 1-12). However, a decrease in landings can be observed between 2013 and 2014. This is likely due to a decrease in edible cockle landings, which decreased from 78 tonnes in 2013 to 0.75 tonnes in 2014, and then recovered in 2016 to 56 tonnes, when the Dundalk Bay Fisheries Plan was implemented (see Figure 1-14). In 2015, an increase in razor clam landings was recorded from 25 tonnes in 2014 to 40 tonnes in 2015, to make up the short fall of edible cockles (see Figure 1-14).

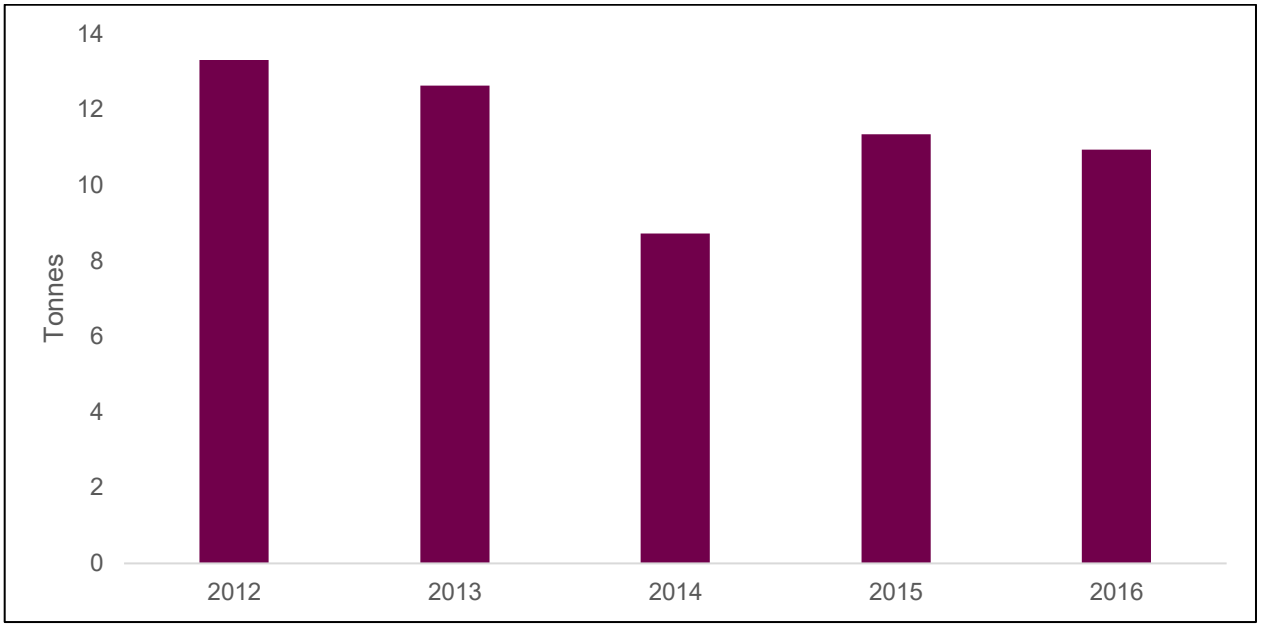

Figure 1-12: Annual average of landed weight (tonnes) of all species landed by RoI vessels from the Commercial Fisheries Study Area (ICES rectangle 36E3) from 2012 to 2016, inclusive (Data source: EU DCF, 2017).

Fishing ports located along the east coast of Ireland include: Howth, a medium-sized artificial harbour which is primarily used as a fishing port; Clogherhead, primarily used for as a fishing port; Wicklow, a large multi-use port; and Arklow, a commercial port.

Between 2017 to 2020, Howth recorded the highest landings (17,927 tonnes) out of the four relevant fishing ports, followed by Clogherhead (5,881 tonnes), Wicklow (5,315 tonnes) and Arklow (3,522 tonnes). Howth Between 2017 to 2020, shellfish dominated the landings, with 20,986 tonnes recorded across all ports, followed by 6,049 and 5,610 tonnes of pelagic and demersal species, respectively. The total landings into all four ports were highest in 2020 (10,359 tonnes), followed by 2017 (8,515 tonnes), 2019 (7,038 tonnes) and

2018 (6,733 tonnes) (SFPA, 2017, 2018, 2019a, 2020). The highest landings recorded in 2020 may not be entirely representative due to the onset of the COVID-19 pandemic and changes to fishing quotas due to Brexit. In 2017, of the relevant fishing ports, Howth recorded landings of 4,331 tonnes, followed by Clogherhead with 1,507 tonnes, Wicklow with 1,375 tonnes and Arklow with 1,301 tonnes. A total of 2,119 tonnes of shellfish were landed into Howth, compared with 825 and 1,386 tonnes for demersal and pelagic species respectively. A total of 1,163 tonnes of shellfish were landed into Clogherhead, compared with 345 tonnes of demersal fish, with no pelagic fish recorded. A total of 1,113 tonnes of shellfish were landed at Wicklow, compared with 262 tonnes of demersal species and no pelagic species recorded. Arklow received 159 tonnes of demersal species and 601 tonnes of pelagic species, with 541 tonnes of shellfish (SFPA, 2017).

In 2018, Howth recorded landings of 3,551 tonnes, followed by Clogherhead with 1,297 tonnes, Wicklow with 1,229 tonnes, and Arklow with 656 tonnes. A total of 1,821 tonnes of shellfish were landed into Howth, alongside 1,025 tonnes of pelagic species and 705 tonnes of demersal species. A total of 1,063 tonnes of shellfish and 234 tonnes of demersal species were landed into Clogherhead, with no pelagic species recorded. A total of 904 tonnes of shellfish were landed into Wicklow, alongside 247 and 78 tonnes of demersal and pelagic species, respectively. Finally, a total of 453 tonnes of shellfish and 203 tonnes of demersal species were landed into Arklow, with no pelagic species recorded (SFPA, 2018).

In 2019, Howth recorded landings of 4,182 tonnes, followed by Clogherhead with 1,250 tonnes, Arklow with 894 tonnes and Wicklow with 712 tonnes. A total of 2,745 tonnes of shellfish were landed into Howth, alongside 742 tonnes of demersal and 695 tonnes of pelagic species. A total of 1,026 tonnes of shellfish, 224 tonnes of demersal and no pelagic species were landed into Clogherhead. A total of 606 tonnes of shellfish, 288 tonnes of demersal and no pelagic species were landed into Arklow. Finally, a total of 530 tonnes of shellfish, 182 tonnes of demersal and no pelagic species were landed into Wicklow (SFPA, 2019a).

In 2020, Howth recorded landings of 5,864 tonnes, followed by Wicklow with 1,999 tonnes, Clogherhead with 1,826 tonnes and Arklow with 670 tonnes. A total of 3,168 tonnes of shellfish were landed into Howth, alongside 2,197 tonnes of pelagic and 499 tonnes of demersal species. A total of 1,773 tonnes of shellfish were landed into Wicklow, with 226 tonnes of demersal and no pelagic species recorded. A total of 1,569 tonnes of shellfish were landed into Clogherhead, compared to 190 and 67 tonnes of demersal and pelagic species, respectively. Finally, a total of 391 tonnes of shellfish, 279 tonnes of demersal and no pelagic species were landed into Arklow (SFPA, 2020).

Historical Context

In 2000, plaice, haddock and cod had the highest quantities landed at Clogherhead (Oriel Windfarm Ltd., 2007), with plaice, cod and monk/angler fish having the highest landed values. Of the shellfish species, prawn tails, *Nephrops* and razor clams were landed in the highest quantities. *Nephrops* and razor clams had the highest value of all shellfish species landed. Shellfish were the dominant sector in 2000, accounting for 82% of the total live weight landed, 78% of landed weight and 84% of the value of landed species (Oriel Windfarm Ltd, 2007). This is consistent with the data provided in Figure 1-13 for the period 2012 to 2016, where shellfish accounted for 95% of the value of landed species (although representing an increase in shellfish species caught from 2000 to 2016). Key targeted species by dredger include the edible cockle, sword razor clam, razor clam and negligible amounts of brown crab. Brown crab, whelk, edible cockle, razor clams and velvet crab were caught using pots. *Nephrops* were caught using bottom trawl gear types. Herring were caught using pelagic trawls and less so using bottom trawls (likely bycatch). The other category of gear type represents bycatch which accounted for 155 tonnes; however, no valuation was achievable due to insufficient value data.

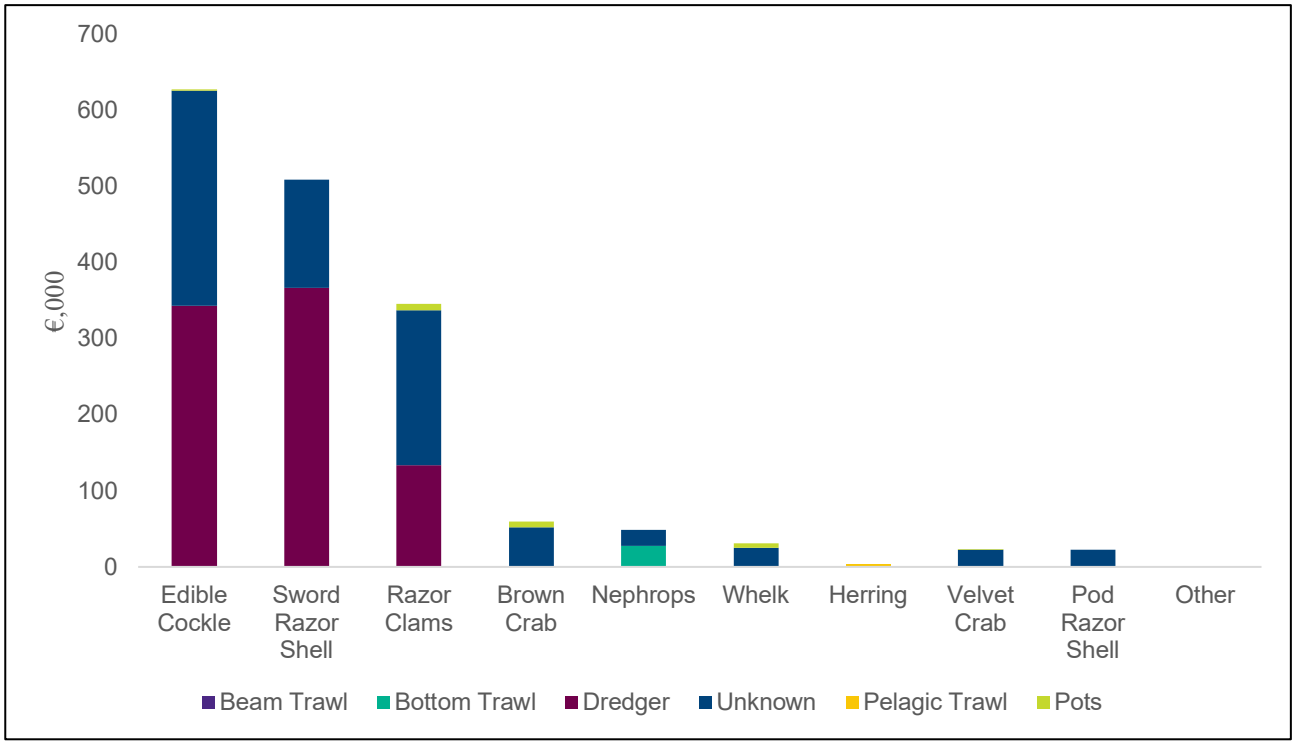

Figure 1-13: Average value (€,000) of all landings by RoI vessels from the Commercial Fisheries Study Area (ICES rectangle 36E3) indicating species and gear type (based on five years data, 2012 to 2016) (Data source: EU DCF, 2017; MMO, 2019). Unknown – unspecified gear types.

Key species landed from the Commercial Fisheries Study Area by RoI registered vessels include sword razor shell *Ensis siliqua*, edible cockle, razor clams, *Nephrops*, whelk, herring, brown crab, velvet crab and pod razor shell (Figure 1-14). In addition to these, brown crab and European lobster are also targeted and landed in the area by the inshore lobster fishing fleet operating out of Annagassan, Dundalk and Port Oriel (mainly represented by the Dunany Lobster and Crab Association; see section 1.3.2 and Figure 1-3). Although these were not identified in the datasets presented above as one of the most commonly landed species, they are known to be important in the area. Annual variations in landings per species are presented in Figure 1-14. Sword razor shell are the most consistently caught species within 36E3, with up to 60 tonnes caught annually, followed by razor clam and *Nephrops*. There was a notable decrease in landings of the edible cockle between 2014 and 2015, prior to the implementation of the Dundalk Bay Fisheries Plan, and a spike in 2015 of razor clam. In recent years there has been a greater number of whelk landings in 36E3, rising from 0.35 tonnes in 2013 to 26 tonnes in 2016; likely reflecting the increase in demand overseas in South Korea, Hong Kong, Japan, China and Singapore (SFPA, 2014). The 'other' category denotes potential bycatch of fish caught. The introduction of changes to the CFP preventing the discarding of live fish at sea in 2012 is likely to be the cause of the notable reduction in this category, as all fish must be landed and categorised.

Figure 1-15 presents the most profitable species, which are sword razor shell, *Nephrops,* razor clams and edible cockle, with sword razor shell remaining stable in line with landings data (Figure 1-14).

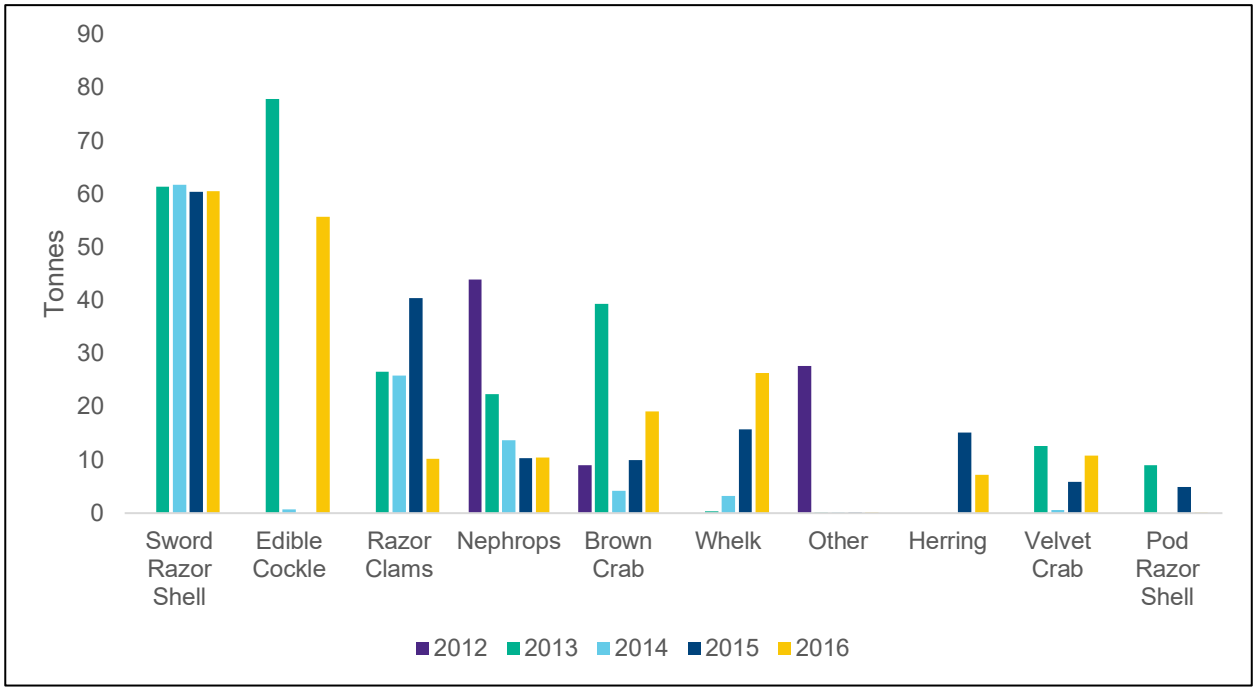

Figure 1-14: Annual average landed weight (tonnes) of landings by RoI vessels from the Commercial Fisheries Study Area (ICES rectangle 36E3) by species (2012 to 2016) (Data source: EU DCF, 2017).

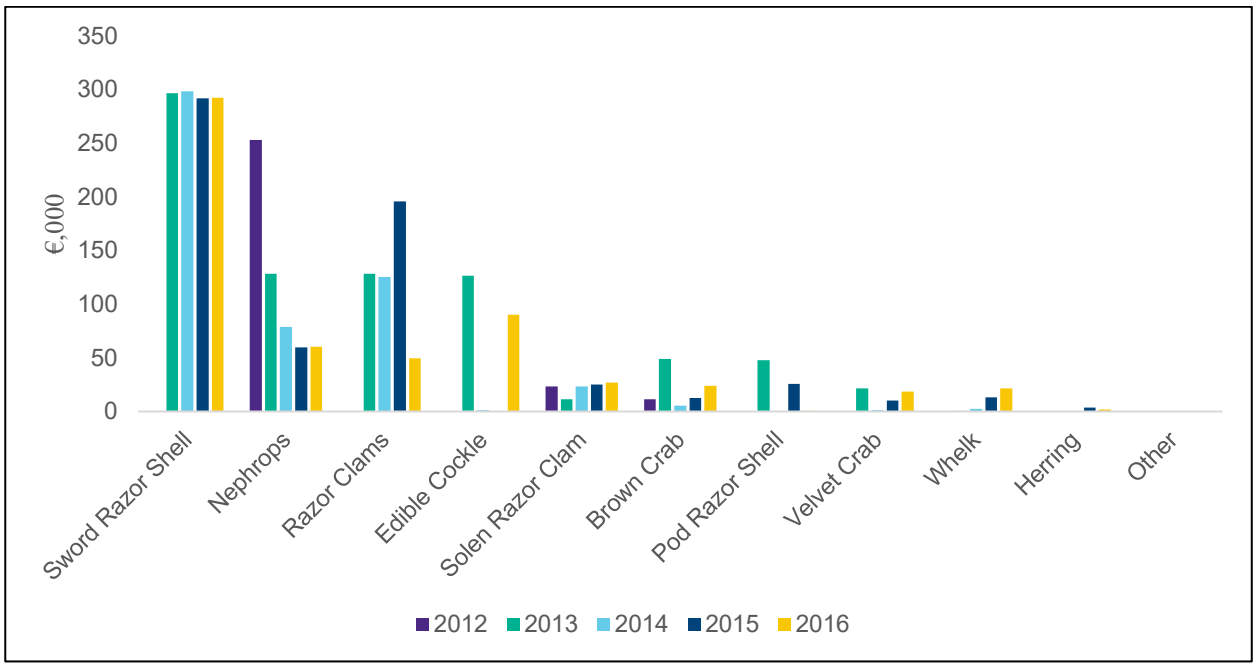

Figure 1-15: Annual average value (€,000) of landings by RoI vessels from the Commercial Fisheries Study Area (ICES rectangle 36E3) by species (2012 to 2016) (Data source: EU DCF, 2017; MMO, 2019).

EU fishing fleet

The offshore wind farm area and offshore cable corridor are located within 12 nm of the Irish coastline. Access to the RoI fishing waters is permitted to vessels from the United Kingdom (England, Wales, Scotland and Northern Ireland), France and Belgium under EU Regulation 1380/2013, from 6 nm to 12 nm (i.e. offshore fishing grounds; Table 1-3). As identified in section 0, Belgium and Scotland represent a very small proportion of the EU vessels fishing within the Commercial Fisheries Study Area (36E3). Furthermore, no French, English or Welsh vessels were identified within 36E3. As such Belgium, Scotland, France, England and Wales have been scoped out from further assessment.

Table 1-3: EU countries with permitted access to RoI inshore waters.

Country	Access	Species
United Kingdom	Hook Point to Carlingford Lough	Demersal, Herring, Mackerel, *Nephrops* and Scallops
France	Haulbowline Point to Carnsore Point	All species except shellfish
Belgium	Wicklow Head to Carlingford Lough	Demersal

Northern Ireland

Ports and vessel fleets

Northern Irish fishing ports in proximity to the Commercial Fisheries Study Area (36E3) include Kilkeel, Ardglass and Portavogie. Kilkeel is the closest port to the offshore wind farm area and offshore cable corridor, however no Northern Ireland ports are located within the Commercial Fisheries Study Area, although vessels from these ports will travel into the Commercial Fisheries Study Area in order to fish.

Consultation with ANIFPO indicated that fishing activities within the Commercial Fisheries Study Area are likely to target *Nephrops,* razor clams, prawns, lobsters and crabs with some mackerel and pollack fishing using handlines at certain times of the year (mainly summer).

Landings trends and key species

The trends in Northern Ireland vessel landings by weight and value from the Commercial Fisheries Study Area (ICES rectangle 36E3) are presented in Figure 1-16.

The average annual landing by Northern Ireland registered vessels between 2015 and 2020 within the Commercial Fisheries Study Area was 1.26 tonnes (£2,933; Figure 1-16). A gradual decrease can be observed between 2015 to 2018 from 1.15 tonnes (£3,518) to 0.74 (£1,577) respectively, a notable increase can be seen in 2019 to 1.81 tonnes (£3,802) followed by a decrease to 1.56 tonnes (£2,880) in 2020, however this may not be representative due to the COVID-19 pandemic (Figure 1-16).

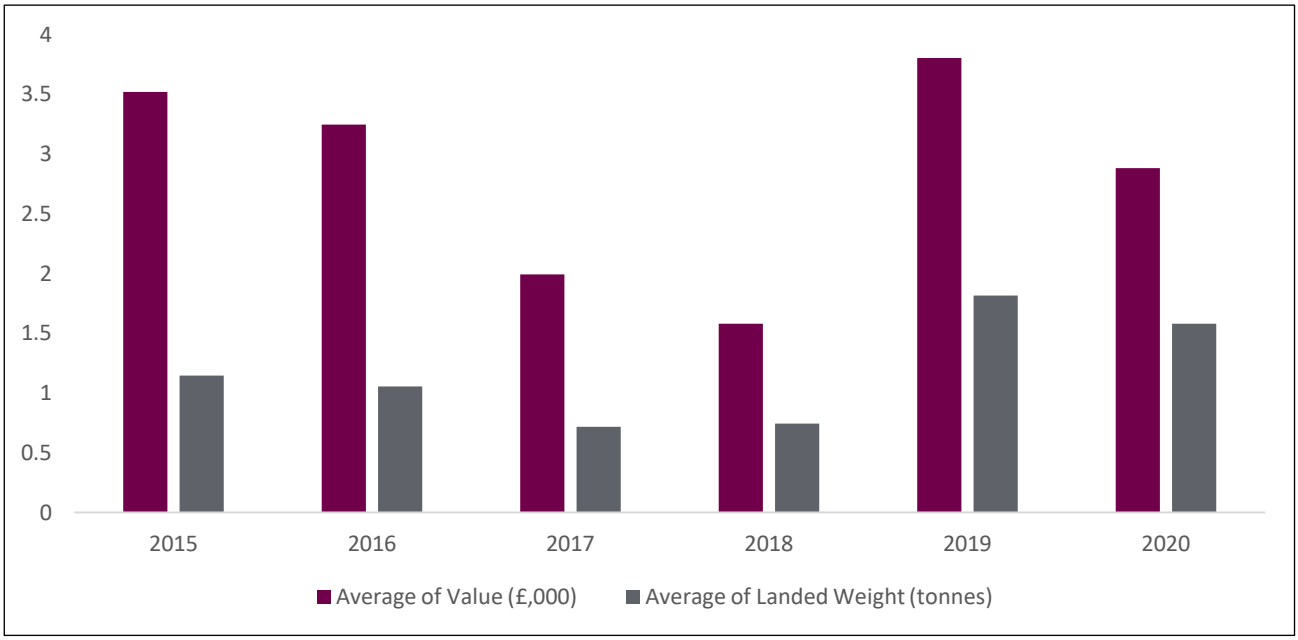

Figure 1-16: Average landed weight and value of all landings by Northern Ireland vessels from the Commercial Fisheries Study Area (ICES rectangle 36E3) (2015 to 2020, inclusive) (Data source: MMO, 2020, 2021).

Key species landed by Northern Ireland vessels within the Commercial Fisheries Study Area include *Nephrops* and queen scallops, targeted by bottom trawls; mussels, cockles, razor clams and scallops targeted by dredgers; and lobsters, brown crabs and velvet crabs by potters (Figure 1-17). Herring are open-water schooling fish and caught by drift and fixed nets within the Commercial Fisheries Study Area.

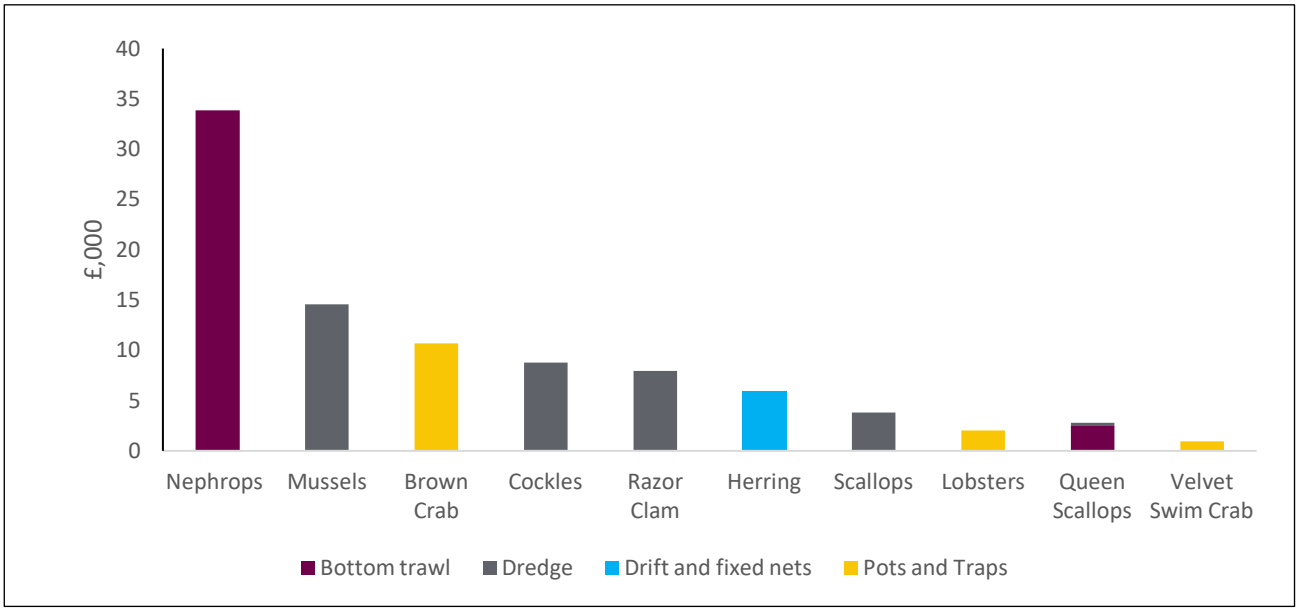

Figure 1-17: Average value (£,000) of all landings by Northern Ireland vessels from the Commercial Fisheries Study Area (ICES rectangle 36E3) by species and gear type (based on six years of data, 2015 to 2020 inclusive) (Data source: MMO, 2020, 2021).

Annual variations in landings (tonnes) per species are presented in Figure 1-18. A notable increase in landings is seen for herring in 2015. However, it should be noted that the fishery has a small market value as reflected in Figure 1-19. The *Nephrops* fishery peaked in 2015 and then gradually declined through to

2018, with a minor increase observed in 2019 (see Figure 1-19). Razor clams and scallops have seen stable fishing activity over 2015 to 2016 but have then seen a decrease in landed catch in 2017 and 2018; however, scallops have seen an increase in landed catch in 2019 and 2020. Queen scallops have seen an increase in landings from 2015 to 2016, but then a decrease in landings in 2017 to 2020. Cockles have seen a spike in landed weight in 2016. All other fisheries have remained fairly stable over the five-year period, except for brown crab which has seen an increase in landings in 2019 and 2020.

In 1999, a licensing system was introduced for vessels targeting scallop (Hatcher *et al.*, 2002) and in 2004 a new licensing scheme (Shellfish Entitlement) was introduced by the UK for vessels targeting all types of shellfish and applies to vessels under 10 m. Other than licensing, scallop, crab and lobster fisheries are only regulated by technical conservation measures, i.e. there are no limits on volumes of non-quota species that can be caught by industry. The absence of non-*Nephrops* shellfish quotas allows the industry to expand according to the dictates of the market and may account for the sporadic spikes seen in 2016 and 2017, potentially representing a change in fisheries strategy. More recently, the absence of regulations has also encouraged diversification from the constrained and congested quota-regulated whitefish and *Nephrops* sectors into the less regulated sectors. Incentive for diversification may also be due to the fact that vessels <10 m in length are officially obliged to only record landings data for *Nephrops*.

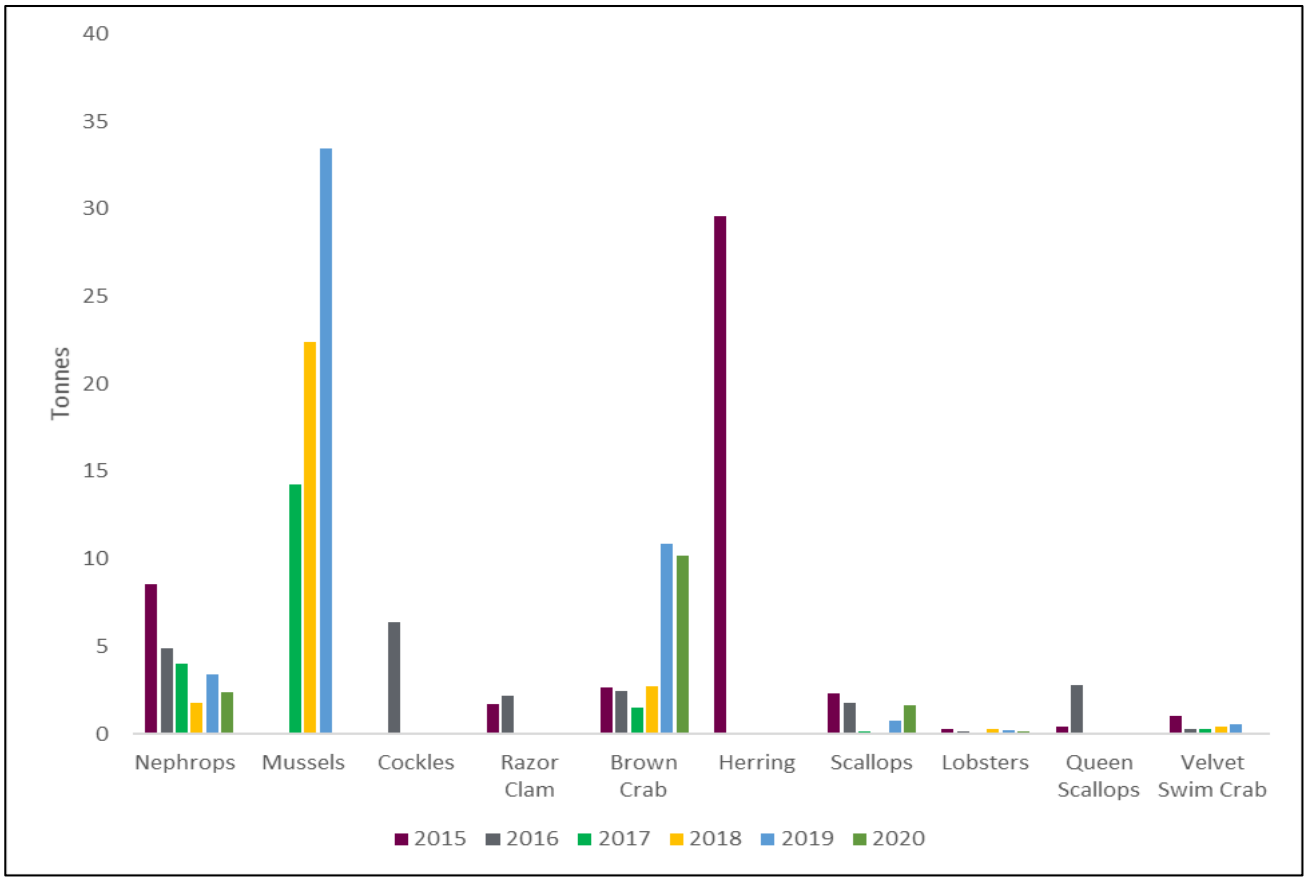

Figure 1-18: Average landed weight (tonnes) of landings by Northern Ireland vessels from the Commercial Fisheries Study Area (ICES rectangle 36E3) by species (2015 to 2020) (Data source: MMO, 2020, 2021).

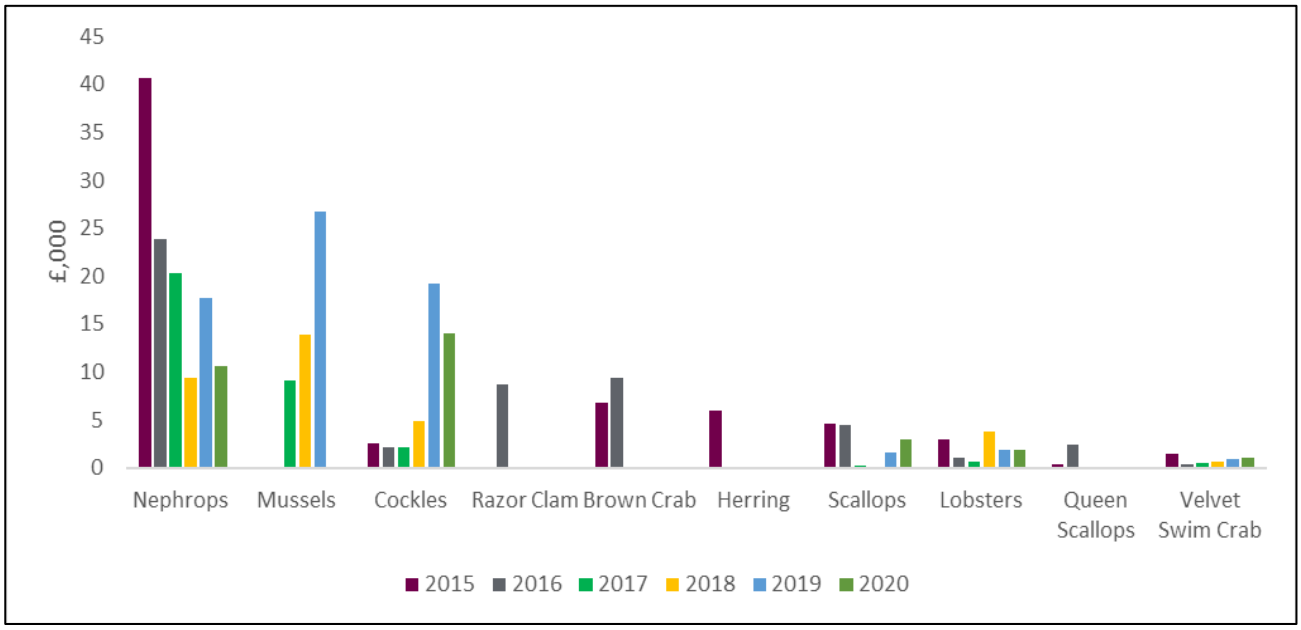

Figure 1-19: Average value (£,000) of landings by Northern Ireland vessels from the Commercial Fisheries Study Area (ICES rectangle 36E3) by species (2015 to 2020) (Data source: MMO, 2020, 2021).

1.4 Summary

This Technical Report has described the key attributes of the commercial fisheries in the Commercial Fisheries Study Area and has identified traditional fishing grounds, commercially important species and EU fisheries activities. Table 1-4 provides a summary of each of the commercial fisheries receptors that have the potential to be impacted by the Project and therefore require consideration in the EIA.

Table 1-4: Summary of Commercial Fisheries within the Commercial Fisheries Study Area (in order of landings value for each nation, all values have been presented in Euros £1 : €1.17 (09/03/2021)).

Fishery	Justification
Republic of Ireland Fishing Fleet (2012 – 2016)	
Dredgers	Vessels targeting shellfish species, such as sword razor shell, edible cockle, razor clam and brown crab likely operating in both inshore and offshore fishing grounds, with a combined species annual average landings value of €211,171 and annual average landed weight of 42.6 tonnes (excluding the other category).
Bottom Trawl	Vessels targeting *Nephrops* likely operating within offshore fishing grounds, with an annual average value of €7,024 and annual average landed weight of 5.9 tonnes.
Pots	Vessels targeting lobsters, brown crabs and velvet crabs, likely operating in offshore fishing grounds with a combined species annual average value of €4,630 and annual average landed weight of 2.9 tonnes.
Pelagic Trawls	Vessels targeting herring likely operating within offshore fishing grounds, with an annual average value of €3,304 and annual average landed weight of 14 tonnes.
Northern Ireland Fishing Fleet (2015 – 2020)	
Bottom Trawl	Vessels targeting *Nephrops* and queen scallops, likely operating in offshore fishing grounds, with a combined species annual average value of €2,265 (£1,936) and annual average landed weight of 0.46 tonnes.
Dredgers	Vessels targeting mussels, cockles, razor clams and scallops, likely operating in inshore or offshore fishing grounds, with a combined species annual average landings value of €8,099 (£6,923) and annual average landed weight of 3.39 tonnes.

Fishery	Justification
Pots	Vessels targeting lobsters, brown crabs and velvet crabs, likely operating in offshore fishing grounds, with a combined species annual average landings value of €5,518 (£4,717) and annual average landed weight of 2.92 tonnes.
Nets	Vessels targeting herring, however it is important to note that the catch presented in appendix 12-1: Commercial Fisheries Technical Report (total catch: 29.6 tonnes = €6,926/£5,920) was only recorded in 2015 and can likely be excluded from assessment.

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