

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Environmental Statement

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Image of an offshore wind farm

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

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MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Errata

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15	PD	APP-059	Volume 4, Annex 6.1: Commercial fisheries technical report	Figure 1.1, Figure 1.44, Figure 1.49, Figure 1.50, Figure 1.51, Figure 1.52, Figure 1.53, Figure 1.54, Figure 1.55, Figure 1.56, Figure 1.61, Figure 1.62, Figure 1.66.	'Data Sources' box in the figures was unpopulated.	The 'Data Sources' box for each figure should read 'Marine Space, ICES, Contains public sector information licenced under the Open Government Licence v3.0'.

Contents

1	COMMERCIAL FISHERIES TECHNICAL REPORT	1
1.1	Introduction	1
1.2	Study area.....	1
1.3	Methodology	3
1.3.1	Official data sources.....	3
1.3.2	Informal consultation	5
1.3.3	Site-specific surveys	13
1.4	Baseline environment	17
1.4.1	Regional overview	17
1.4.2	Overview of the commercial fisheries study area.....	17
1.4.3	Overview of landings.....	20
1.4.4	Temporal variation.....	22
1.4.5	Species.....	26
1.4.6	Gear types	38
1.4.7	Ports	51
1.4.8	Spatial distribution of fishing activity	56
1.4.9	Site-specific surveys	74
1.5	Future baseline	88
1.6	Summary	89
1.7	References	90

Tables

Table 1.1:	Summary of key official data sources.	3
Table 1.2:	Summary of key consultation topics raised during consultation activities undertaken for the Morgan Generation Assets relevant to commercial fisheries.	6
Table 1.3:	Summary of surveys used to inform commercial fisheries.....	14
Table 1.4:	Seasonal closures of the scallop fisheries by administration.	18
Table 1.5:	Overview of key species targeted within the commercial fisheries study area.	28
Table 1.6:	Summary of fishing vessels identified during the Morgan Generation Assets vessel traffic surveys 21 November to 04 December 2021, 15 to 29 July 2022, 04 to 18 May 2023, 03 to 17 August 2023 and 11 to 27 November 2023.	74
Table 1.7:	Summary of fishing vessels identified by the OFLO and MarineSpace during offshore surveys.....	83
Table 1.8:	Quota share changes by 2026 for the UK, for species within the Irish Sea.	88

Figures

Figure 1.1:	The commercial fisheries study area for Morgan Generation Assets.....	2
Figure 1.2:	Sum of landed weight by vessel size class (2012 to 2022) within the commercial fisheries study area (UK and Isle of Man vessels).	21
Figure 1.3:	Sum of landed weight by vessel size class (2006 to 2016) within the commercial fisheries study area) (non-UK vessels).....	22
Figure 1.4:	Annual trends in landings weight (2012 to 2022) within the commercial fisheries study area (UK and Isle of Man vessels).	23
Figure 1.5:	Annual trends in sum of landings value (2012 to 2022) within the commercial fisheries study area (UK and Isle of Man vessels).	23
Figure 1.6:	Annual trends in sum of landed weight (2006 to 2016) within the commercial fisheries study area (non-UK vessels).	24
Figure 1.7:	Seasonal trends in sum of landed weight (2012 to 2022) within the commercial fisheries study area (UK and Isle of Man vessels).....	25
Figure 1.8:	Seasonal trends in sum of landed value (2012 to 2022) within the commercial fisheries study area (UK and Isle of Man vessels).	25
Figure 1.9:	Seasonal trends in sum of landed weight (2006 to 2016) within the commercial fisheries study area (non-UK vessels).....	26

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Figure 1.10: Sum of landed weight within the commercial fisheries study area, displayed by species group (2012 to 2022) (UK and Isle of Man vessels).	27
Figure 1.11: Sum of landed value within the commercial fisheries study area, displayed by species group (2012 to 2022) (UK and Isle of Man vessels).	27
Figure 1.12: Sum of landed weight and value within the commercial fisheries study area for the top 15 species (2012 to 2022) (UK and Isle of Man vessels).	28
Figure 1.13: Seasonality of landed weight (t) of King scallop within the commercial fisheries study area (2012 to 2022) (UK and Isle of Man vessels).	29
Figure 1.14: Seasonality of landed weight (t) of Queen scallop within the commercial fisheries study area (2012 to 2022) (UK and Isle of Man vessels).	30
Figure 1.15: Seasonality of landed weight (t) of whelk within the commercial fisheries study area (2012 to 2022) (UK and Isle of Man vessels).	31
Figure 1.16: Seasonality of landed weight (t) of lobster within the commercial fisheries study area (2012 to 2022) (UK and Isle of Man vessels).	32
Figure 1.17: Seasonality of landed weight (t) of herring within the commercial fisheries study area (2012 to 2022) (UK and Isle of Man vessels).	33
Figure 1.18: Total landings (t) from Belgian vessels within the commercial fisheries study area displayed for the top 20 species (2006 to 2016).	34
Figure 1.19: Total landings (t) from Irish vessels within the commercial fisheries study area displayed for the top 20 species (2006 to 2016).	35
Figure 1.20: Total landings (t) from French vessels within the commercial fisheries study area displayed by species (2006 to 2016).	35
Figure 1.21: Total landings (t) from Dutch vessels within the commercial fisheries study area, displayed by species (2006 to 2016).	36
Figure 1.22: Annual trends in the top 15 species by total landings weight (2006 to 2016) within the commercial fisheries study area (non-UK vessels).	37
Figure 1.23: Seasonal trends in the top 15 species by total landings weight (2006 to 2016) within the commercial fisheries study area (non-UK vessels).	38
Figure 1.24: Total landings weight by gear type within the commercial fisheries study area (2012 to 2022) (UK and Isle of Man vessels).	39
Figure 1.25: Total landings weight by gear type (2006 to 2016) within the commercial fisheries study area (non-UK vessels).	39
Figure 1.26: Total landings weight from English vessels by gear type within the commercial fisheries study area (2012 to 2022).	40
Figure 1.27: Total landings weight from Isle of Man vessels by gear type within the commercial fisheries study area (2012 to 2022).	41
Figure 1.28: Total landings weight from a Jersey vessel by gear type within the commercial fisheries study area (2012 to 2022).	41
Figure 1.29: Total landings weight from Northern Irish vessels by gear type within the commercial fisheries study area (2012 to 2022).	42
Figure 1.30: Total landings weight from Scottish vessels by gear type within the commercial fisheries study area (2012 to 2022).	43
Figure 1.31: Total landings weight from Welsh vessels by gear type within the commercial fisheries study area (2012 to 2022).	43
Figure 1.32: Total landings weight from Belgian vessels by gear type (2006 to 2016) within the commercial fisheries study area.	44
Figure 1.33: Total landings weight from French vessels by gear type (2006 to 2016) within the commercial fisheries study area.	44
Figure 1.34: Total landings weight from Irish vessels by gear type (2006 to 2016) within the commercial fisheries study area.	45
Figure 1.35: Total landings weight from Dutch vessels based on gear type (2006 to 2016) within the commercial fisheries study area.	45
Figure 1.36: Typical dredge gear configuration.	47
Figure 1.37: Scallop dredge vessel example.	47
Figure 1.38: Typical demersal trawl gear configuration.	48
Figure 1.39: Example demersal trawl vessels.	48

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Figure 1.40: Typical potting gear configuration.....	50
Figure 1.41: Typical whelk pot and whelk vessel.	50
Figure 1.42: Typical beam trawl gear configuration.	51
Figure 1.43: Beam trawl vessel example.	51
Figure 1.44: Fishing value (£) by regional ports (2009 to 2020).	52
Figure 1.45: Total landings into Fleetwood (2012 to 2022) displayed by species group, vessel length and nationality.	54
Figure 1.46: Total weight and value of landings into Fleetwood port (2012 to 2022) displayed by the top 10 species by weight.	54
Figure 1.47: Total landings into Douglas (2012 to 2022) displayed by species group, vessel length and nationality.....	55
Figure 1.48: Total weight and value of landings into Fleetwood port (2012 to 2022) displayed by the top 10 species by weight.	56
Figure 1.49: Annual fishing effort by vessels utilising pots and traps gear (UK vessels ≥ 15 m and Isle of Man vessels) (2016 to 2020).	58
Figure 1.50: Annual fishing effort by vessels utilising beam trawls (UK and EU vessels > 12 m) (2009 to 2020).	59
Figure 1.51: Annual fishing effort by vessels utilising dredges (UK and EU vessels > 12 m) (2009 to 2020). .	60
Figure 1.52: Annual fishing effort by vessels utilising otter trawls (UK and EU vessels > 12 m) (2009 to 2020).	61
Figure 1.53: King scallop fishing activity within the Irish Sea.....	63
Figure 1.54: Indicative Queen scallop grounds fished by Scottish vessels within the Morgan Array Area.	64
Figure 1.55: Estimated relative fishing intensity – static gear vessels.	66
Figure 1.56: Estimated relative fishing intensity – mobile gear vessels.	67
Figure 1.57: King scallop dredge swept area (km ²) by IS Box within and around the Isle of Man Territorial Sea (2017/18 to 2022/23).....	69
Figure 1.58: Queen scallop swept area (km ²) by IS Box within and around the Isle of Man Territorial Sea (2018 to 2022)	70
Figure 1.59: Isle of Man crab and lobster pot haul effort within ICES Rectangle 37E5 (2010 to 2021)	72
Figure 1.60: Isle of Man whelk pot haul effort within ICES Rectangle 37E5 (2010 to 2021).....	73
Figure 1.61: AIS fishing vessel track data from 21 November to 04 December 2021.	78
Figure 1.62: AIS fishing vessel track data from 15 to 29 July 2022.	79
Figure 1.63: AIS fishing vessel track data from 04 to 18 May 2023.	80
Figure 1.64: AIS fishing vessel track data from 03 to 17 August 2023.....	81
Figure 1.65: AIS fishing vessel track data from 11 to 27 November 2023.	82
Figure 1.66: Observations of fishing vessels by the OFLO (30 June to 18 September 2021 and 01 April to 10 July 2022) and MarineSpace (10 July to 30 November 2022).....	87

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Glossary

Term	Meaning
Beam trawl	Beam trawls consist of nets that are held open by a heavy tubular steel beam, which is towed along the seabed. Beam trawls may use tickler chains, which are attached at the front of the net and slide along the seabed to disturb species of fish within its path, encouraging them to rise up into the net behind.
Company Fisheries Liaison Officer	Primary contact for the Fishing Industry Representative (FIR) and Offshore Fisheries Liaison Officer (OFLO). Main point of contact for bp/EnBW for any commercial fisheries related queries.
Demersal trawl	Demersal trawls consist of cone-shaped nets that are towed along the seabed to target demersal fish species. The mouth of the trawl is spread and held open by a pair of adjacent trawl doors.
Dredge	Dredges consist of rigid structures that target numerous species of shellfish through towing along the seabed. Dredges typically have an open-frame mouth with a collection bag.
Fisheries Industry Representative	Primary contact point within the fishing community, provider of feedback to the Company Fisheries Liaison Officer (CFLO) and OFLO and disseminator of Project information.
Gill nets	Gill nets are nets which hang vertically in the water column which entangle fish as they swim into it.
ICES Rectangle	Defined areas used for the gridding of data. Each rectangle is 30 minute latitude by 1 degree longitude.
Inshore waters (England and Wales)	Mean High Water Springs to 12 nm offshore.
IS Boxes	IS Boxes are used to collect data for the Isle of Man Nest Forms Electronic Daily Scallop Catch Return. There are four IS Boxes per ICES Rectangle.
Kilowatt	Engine power of a fishing vessel. This is used in the calculation of fishing effort for Vessel Monitoring Systems (VMS) data, whereby the time associated with the VMS report is multiplied by the engine power of the fishing vessel. Engine power with gross tonnage determines the size of fishing license require and therefore allowable catch, discards and quotas.
Minimum Landing Size	The smallest measurement of a fish or shellfish species that can be legally sold or landed.
Offshore Fisheries Liaison Officer	Liaison between fishing vessels and clients, using local knowledge and fisheries experience to ensure offshore operations run smoothly and encourage co-operation. Provider of feedback to the CFLO and FIR.
Otter trawl	Otter trawls consist of a pair of otter boards (large rectangular boards) which holds open the mouth of a net.
Pelagic trawl	Pelagic trawls consist of nets which are used to catch fish in the water column, rather than on the seafloor.
Seine nets	Seine nets consist of a large net which is drawn together to surround and enclose a shoal of fish.
Static gear	Gear that is set to catch fish or shellfish. This is a collective term and includes gears such as pots, traps and set nets.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Acronyms

Acronym	Description
AIS	Automatic Identification System
ANIFPO	Anglo-North Irish Fish Producers
CEFAS	Centre for Environment, Fisheries and Aquaculture Science
CFLO	Company Fisheries Liaison Officer
CFP	Common Fisheries Policy
DECC	Department of Energy and Climate Change
DEFA	Department of Environment, Food and Agriculture (IoM Government)
EIA	Environmental Impact Assessment
EU	European Union
EU STECF	European Union Scientific, Technical and Economic Committee for Fisheries
FIR	Fisheries Industry Representative
ICES	International Council for the Exploration of the Sea
IoM	Isle of Man
IVMS	Inshore Vessel Monitoring Systems
ISEFPO	Irish South & East Fish Producers Organisation
MFPO	Manx Fish Producers Organisation
MLS	Minimum Landing Size
MMO	Marine Management Organisation
MSAR	Monthly Shellfish Activity Report
NFFO	National Federation of Fishermen's Organisations
NIFPO	Northern Ireland Fish Producers Organisation
NRW	Natural Resource Wales
NWWAC	North Western Waters Advisory Council
OFLO	Offshore Fisheries Liaison Officer
PEIR	Preliminary Environmental Information Report
SFF	Scottish Fishermen's Federation
SWFPA	The Scottish White Fish Producers Association Ltd
TAC	Total Allowable Catch
UK	United Kingdom
VMS	Vessel Monitoring Systems
WCSP	West Coast Sea Products Ltd
WFA	Welsh Fishermen's Association
WFC	Whitehaven Fishermen's Cooperative
WFPO	Western Fish Producers Organisation

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Acronym	Description
WG	Welsh Government
WGSCALLOP	The ICES Scallop Assessment Working Group

Units

Unit	Description
£	Pound sterling
ft	Foot (unit)
km	Kilometre
knots	Knots (nautical mile per hour)
kW	Kilowatt (power)
kW/day	Kilowatt days
kWh	Kilowatt hours
m	Meters
nm	Nautical miles (distance; 1 nm = 1.852 km)
t	Tonnes

1 Commercial fisheries technical report

1.1 Introduction

- 1.1.1.1 This Morgan Offshore Wind Project: Generation Assets (hereafter referred to as the Morgan Generation Assets) commercial fisheries technical report provides a detailed description of commercial fishing activity within the area of the proposed Morgan Generation Assets and the wider, east Irish Sea region. The information within this technical report has been used to inform the Environmental Impact Assessment (EIA). The Morgan Generation Assets is described in detail in Volume 1, Chapter 3: Project description of the Environmental Statement.
- 1.1.1.2 This technical report has been produced by MarineSpace Ltd on behalf of RPS, the lead EIA consultant for the Morgan Generation Assets by bp/EnBW (hereafter referred to as the Applicant). MarineSpace also provides the role of Company Fisheries Liaison Officer (CFLO) on behalf of the Applicant.
- 1.1.1.3 This technical report has the following objective:
- To provide a baseline for commercial fishing activity in relation to the Morgan Generation Assets, and wider east Irish Sea region, through a review of official datasets; additional information and knowledge obtained through consultation with fisheries groups; and site-specific surveys.
- 1.1.1.4 This technical report should be read in conjunction with the following:
- Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement and Volume 4, Annex 3.1: Fish and shellfish ecology technical report of the Environmental Statement
 - Volume 2, Chapter 7: Shipping and navigation of the Environmental Statement and Volume 4, Annex 7.1: Navigational risk assessment of the Environmental Statement
 - Volume 2, Chapter 9: Other sea users of the Environmental Statement.
- 1.1.1.5 Recreational rod and line fishermen, as well as charter-angling operators, are also active in the region, more details can be found in Volume 2, Chapter 9: Other sea users of the Environmental Statement.

1.2 Study area

- 1.2.1.1 The Morgan Generation Assets is located within the International Council for the Exploration of the Sea (ICES) Division VIIa (Irish Sea) statistical area, which is divided into statistical rectangles for the purpose of recording fisheries landings. The Morgan Array Area is located within ICES Rectangle 36E5, 36E6, 37E5 and 37E6 (illustrated on Figure 1.1 below).
- 1.2.1.2 A broad Morgan Generation Assets commercial fisheries study area has been defined for the purposes of this technical report, to provide a wider regional context to the current fisheries activity and to ensure that potential effects (e.g. displacement of fishing vessels) from the Morgan Generation Assets on commercial fisheries are fully assessed. Therefore, for the purposes of this technical report, the commercial fisheries study area is defined as ICES Rectangles 36E5, 36E6, 37E5 and 37E6.
- 1.2.1.3 The Morgan Array Area is located wholly within English waters (see Figure 1.1).

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

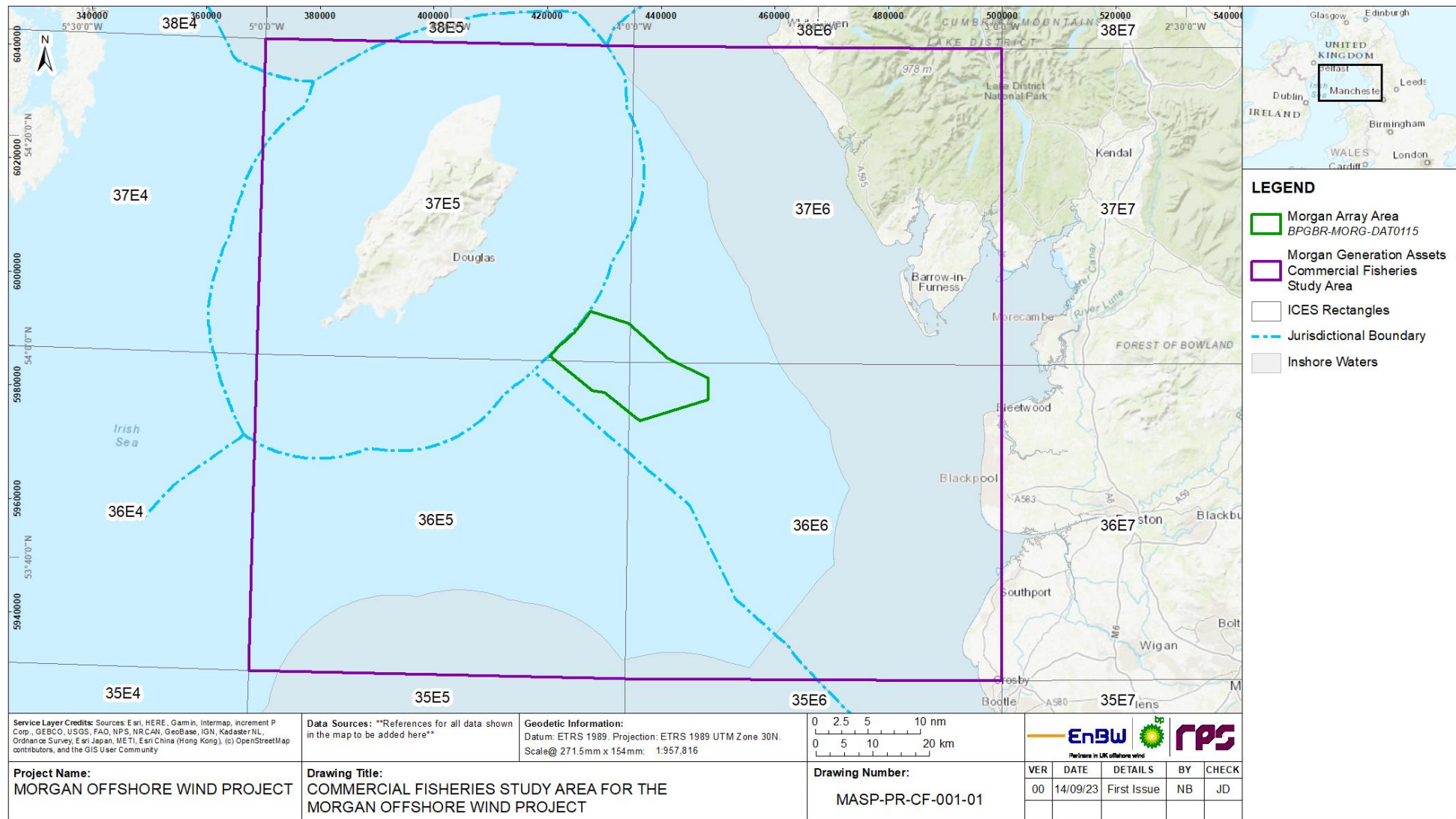


Figure 1.1: The commercial fisheries study area for Morgan Generation Assets.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

1.3 Methodology

1.3.1.1 To characterise commercial fishing activity in the Morgan Generation Assets commercial fisheries study area, a range of data sources were collated and reviewed, in addition to feedback from project-specific consultation and site-specific surveys.

1.3.1 Official data sources

1.3.1.1 Information on commercial fisheries within the commercial fisheries study area was collected through a detailed desktop review of existing studies and official datasets, as listed in Table 1.1.

1.3.1.2 To account for trends and seasonal variations in vessel landings and effort, where possible, data has been collated for a 10-year period, as consultation feedback has indicated that the scallop fisheries operating in the vicinity of the Morgan Generation Assets are cyclical, over periods of seven to eight years. The most recently available datasets have been collated from the various sources where possible.

1.3.1.3 There are a range of different limitations and assumptions associated with the data, as summarised in Table 1.1. A confidence level has been assigned to each dataset, informed by the assessment team's expert judgment and based on the various data limitations (e.g. age of dataset, spatial resolution and size of vessels included). Care has been taken when interpreting the data, particularly those with lower confidence levels. Feedback from consultation (discussed further in section 1.3.1 and summarised in Table 1.2) has been used to supplement the official datasets, particularly where there are recognised data limitations.

1.3.1.4 It is also important to note that all the values presented by the official data sources relate to value of landings (i.e. first-sale value at the quayside). Additional value (estimated at up to 60% of landed value) is added to many fish products, especially shellfish such as scallop, crab and lobster, via onshore processing. The onshore processing sector is reliant on the fish products represented in the official data sources and supports a large number of jobs.

Table 1.1: Summary of key official data sources.

Title	Source	Year	Confidence level and limitations
Landing statistics by ICES Rectangle for UK and Isle of Man vessels (all vessel sizes).	Marine Management Organisation (MMO)	2012 to 2022	<ul style="list-style-type: none"> High confidence Finest available level of spatial resolution is by ICES Rectangle Duplication of species under different common names and grouping at higher taxonomic levels.
Landings statistics by port (all vessel sizes).	MMO	2012 to 2022	<ul style="list-style-type: none"> High confidence Vessels ≤ 10 m are not required to complete logbooks, so may be under- represented within the data.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Title	Source	Year	Confidence level and limitations
Landings statistics by ICES Rectangle for European Union (EU) vessels (all vessel sizes).	European Union Scientific, Technical and Economic Committee for Fisheries (EU STECF)	2006 to 2016	<ul style="list-style-type: none"> • Medium confidence • Finest available level of spatial resolution is by ICES Rectangle • Data is provided by Member States - variable levels of confidence • Lack of recent landings data • Vessels ≤ 10 m are not required to complete logbooks, so may be under- represented within the data • Duplication of species under different common names and grouping at higher taxonomic levels.
Vessel Monitoring Systems (VMS) data for UK and Isle of Man vessels (≥ 15 m).	MMO	2009 to 2020	<ul style="list-style-type: none"> • Medium confidence • Finest available level of spatial resolution is by ICES sub-rectangle • Uncertainty in exact position of fishing footprint due to resolution • Processing of the VMS data obtains a proxy of effort based on time, position, and a certain speed. However, vessel speed is not 100% accurate as an indicator of fishing activity, since it does not identify whether fishing is occurring or not • Vessels < 15 m are not included within the dataset.
VMS data for European ¹ mobile bottom contacting gear vessels (> 12 m).	ICES, 2020	2009 to 2020	<ul style="list-style-type: none"> • Medium confidence • Finest available level of spatial resolution is by ICES sub-rectangle • Uncertainty in exact position of fishing footprint • Processing of the VMS data obtains a proxy of effort based on time, position, and a certain speed. However, vessel speed is not 100% accurate as an indicator of fishing activity since it does not identify whether fishing is occurring or not • Vessels < 12 m are not included within the dataset • Data only for mobile bottom contacting gears • Data is provided by Member States - variable levels of confidence • Not inclusive of vessels from the Isle of Man.
UK Inshore Fishing Intensity.	Centre for Environment, Fisheries and Aquaculture Science (CEFAS)	2010 to 2012	<ul style="list-style-type: none"> • Low level of confidence – based on surveillance and sightings data, so areas which were visited less often would result in lower confidence • Data outdated • Only vessels < 15 m included.

¹ This dataset was collated prior to the UK's withdrawal from the EU, so includes data from UK vessels.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Title	Source	Year	Confidence level and limitations
ICES scallop assessment working group.	ICES	2012-2019	<ul style="list-style-type: none"> • Low-medium confidence • Data sources used by the scallop working group: <ul style="list-style-type: none"> – VMS data for vessels from England, Wales Scotland, Isle of Man, Guernsey and Jersey from 2009 to 2017 – VMS data for vessels from Northern Ireland from 2012 to 2016 – VMS data for vessels from Ireland for 2012 to 2019 • Polygon data based on VMS data, so activity from vessels <12 m may not be included • Preliminary maps, pending verification by the working group • Towards the periphery of the polygons there may be limited fishing intensity • Some of the defined polygons may have areas within them with zero or low VMS data which is not displayed.
Isle of Man pot hauls	Isle of Man Government, Department of Environment, Food and Agriculture (DEFA), 2023	2010 to 2021	<ul style="list-style-type: none"> • Medium confidence • Data has a limited spatial extent and limited resolution.
Isle of Man swept area	Isle of Man Government, Department of Environment, Food and Agriculture (DEFA), 2023	2017 to 2023	<ul style="list-style-type: none"> • Medium confidence • Based on EU VMS data merged with NestForms data • Data has a limited spatial extent.

1.3.2 Informal consultation

- 1.3.2.1 In addition to the review of official data and relevant studies, informal consultation has been undertaken with key local and regional fisheries stakeholders since June 2021 and will continue beyond the Application submission and throughout the development and implementation of the Fisheries Liaison and Co-existence Plan. This consultation has been arranged by MarineSpace, in its role as CFLO, assisted by the appointed Fisheries Industry Representative (FIR) for the Morgan Generation Assets.
- 1.3.2.2 A summary of the key matters raised during consultation activities undertaken to date, specific to commercial fisheries, is presented in Table 1.2.
- 1.3.2.3 Outputs from these consultations that have taken place over the consenting phase have been used to develop further understanding of existing fishing activity in the region and are captured throughout this document, ensuring that all relevant information from fisheries stakeholders is presented within the EIA.
- 1.3.2.4 Table 1.2 also includes Scoping Opinion responses and Section 42 (S42) consultation responses on the Morgan Generation Assets Preliminary Environmental Information Report (PEIR) which are relevant to the commercial fisheries baseline. Responses to the topics raised and how these have been addressed and incorporated are outlined in Volume 2, Chapter 6: Commercial fisheries of the Environmental Statement.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Table 1.2: Summary of key consultation topics raised during consultation activities undertaken for the Morgan Generation Assets relevant to commercial fisheries.

Date	Consultee and purpose of consultation	Topics raised
June 2021	<p>Individual fishers from Fleetwood and Maryport; Irish South and East Fish Producers Organisation (ISEFPO); Manx Fish Producers Organisation (MFPO); National Federation of Fisherman's Organisations (NFFO); Welsh Fishermen's Association (WFA); Western Fish Producers Organisation (WFPO); and Whitehaven Fishermen's Cooperative (WFC).</p> <p>Introductory meeting to introduce the Morgan Generation Assets team, provide fisheries stakeholders with an overview of the Morgan Generation Assets, outline the 2021 offshore survey programme and discuss potential impacts on fisheries stakeholders.</p>	<ul style="list-style-type: none"> • Queries regarding spacing arrangements of infrastructure and co-existence during the operations and maintenance phase. Scallop vessels would require greater spacing of wind turbines • Queries regarding cumulative and in-combination impacts with other activities and developments in the region • Queries regarding impacts on fish stocks • Long-term datasets should be used where possible, particularly due to the dynamic nature of queen scallop beds • There are seven Irish scallop vessels that are normally active in the area mid-winter to spring.
June 2021	<p>Scottish Fishermen's Federation (SFF); Scottish White Fish Producers Association (SWFPA); and West Coast Sea Products Ltd (WCSP).</p> <p>Introductory meeting to introduce the Morgan Generation Assets team, provide fisheries stakeholders with an overview of the Morgan Generation Assets, outline 2021 offshore survey programme and discuss potential impacts on fisheries stakeholders.</p>	<ul style="list-style-type: none"> • Lease areas (particularly in the west of the lease area) are in key queen scallop grounds and also an important area for king scallop • Discussed existing scallop closures in Irish Sea • Queries regarding spacing arrangements of infrastructure and co-existence during the operations and maintenance phase. Scallop vessels would require greater spacing of wind turbines.
July 2021	<p>Anglo North Irish Fish Producers Organisation (ANIFPO); Northern Ireland Fish Producers' Organisation (NIFPO); and Rederscentrale.</p> <p>Introductory meeting to introduce the Morgan Generation Assets team, provide fisheries stakeholders with an overview of the Morgan Generation Assets, outline the 2021 offshore survey programme and discuss potential impacts on fisheries stakeholders.</p>	<ul style="list-style-type: none"> • Queries regarding spacing arrangements of infrastructure and co-existence during the operations and maintenance phase. Belgian vessels would not fish between wind turbines, so preference for closer spacing to minimise overall area of sea affected by the Morgan Generation Assets • Queries regarding cumulative and in-combination impacts with other activities and developments • Queries regarding impacts on fish stocks • Queries regarding timing of surveys due to herring spawning – request to avoid seismic activity and grab sampling during spawning period • Belgian vessels active in the east parts of the lease areas during winter months.
July 2021	<p>ANIFPO</p> <p>Email correspondence, following introductory meeting, to discuss the 2021 offshore survey programme.</p>	<ul style="list-style-type: none"> • Douglas Bank herring closure 21 September to 15 November to protect spawning period. Requested benthic sampling to be completed before the spawning period and geotechnical work to avoid if possible.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Date	Consultee and purpose of consultation	Topics raised
July 2021	NFFO Introductory meeting to introduce the Morgan Generation Assets team, provide fisheries stakeholders with an overview of the Morgan Generation Assets, outline the 2021 offshore survey programme and discuss potential impacts on fisheries stakeholders.	<ul style="list-style-type: none"> • Discussion over practicalities of a Regional Fisheries Working Group • Queries regarding spacing arrangements of infrastructure and co-existence during the operations and maintenance phases • Emphasised the importance of early engagement with the fishing industry • Queries regarding cumulative and in-combination impacts with other activities and developments.
December 2021	WCSP Email correspondence regarding value of the fishery.	<ul style="list-style-type: none"> • Rely on a proportion of the Morgan Array Area for catching queen scallop • West areas of lease areas are more important fishing grounds, but east areas are important for spawning • Queen scallop recruitment is cyclical over seven to eight year periods, so assessments should consider longer-term view, (e.g. major stock biomass during 2010 to 2014) • WCSP vessels typically tow north to south with the tide • Six active vessels, 40 fishers and 100 (onshore) factory staff • Four other queen scallop processors (with multiple vessels) have fished within the area over the last 10 years.
January 2022	WFPO Email correspondence regarding value of the fishery.	<ul style="list-style-type: none"> • One beam trawl vessel from the WFPO fishes in the commercial fisheries study area during Q1 and Q2 • One whelk vessel fishes in the commercial fisheries study area during Q3 and Q4.
February 2022	Individual fishers from Fleetwood and Maryport; and ISEFPO. Meeting to update on the Morgan Generation Assets 2022 offshore survey programme, PEIR programme and outline of datasets to inform the PEIR.	<ul style="list-style-type: none"> • Value of cross-referencing official datasets with feedback from consultation • Discussions regarding survey coordination and working around fishing vessels.
February 2022	MFPO, NFFO and WFC. Meeting to update on the Morgan Generation Assets 2022 offshore survey programme, PEIR programme and outline of datasets to inform the PEIR.	<ul style="list-style-type: none"> • Queries regarding the interconnectivity of scallop stocks in the region and potential impacts • Discussion regarding inter-array cable layout (and burial depth) to allow scallop fishing during operations and maintenance phase.
February 2022	ANIFPO, Rederscentrale and WFPO. Meeting to update on the Morgan Generation Assets 2022 offshore survey programme, PEIR programme and outline of datasets to inform the PEIR.	<ul style="list-style-type: none"> • Queries regarding cumulative and in-combination impacts with other activities and developments • Queries regarding impacts on fish stocks • Queries regarding VMS data not capturing smaller vessels.
February 2022	SFF, SWFPA and WCSP. Meeting to update on the Morgan Generation Assets 2022 offshore survey programme, PEIR programme and outline of datasets to inform the PEIR.	<ul style="list-style-type: none"> • Discussion regarding location of offshore substation to cause least disruption to fisheries • Queries regarding VMS and Automatic Identification Systems (AIS) data not capturing smaller vessels • To minimise the impacts on queen scallop grounds, wind turbines should be micro-sited

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Date	Consultee and purpose of consultation	Topics raised
		<ul style="list-style-type: none"> Importance of the queen scallop grounds, particularly in the northwest part of the Morgan Array Area Dogger Bank offshore wind farm is an example of where wind turbine spacing and inter-array cable layout facilitates coexistence Uncertainties regarding gear penetration depths.
February 2022	Individual charter boat skippers. Email correspondence requesting update on project.	<ul style="list-style-type: none"> Requested to be added to future fisheries stakeholder meetings.
April 2022	SFF, SWFPA and WCSP. Response to the Morgan Generation Assets questionnaire on array layout/fisheries co-existence.	<ul style="list-style-type: none"> Information on spatial extent of fishing activity, spacing arrangements of infrastructure and cable burial.
April 2022	Rederscentrale Response to the Morgan Generation Assets questionnaire on array layout/fisheries coexistence.	<ul style="list-style-type: none"> Information on spatial extent of fishing activity, spacing arrangements of infrastructure and cable burial.
May 2022	MFPO Response to the Morgan Generation Assets questionnaire on array layout/fisheries coexistence.	<ul style="list-style-type: none"> Information on spatial extent of fishing activity, spacing arrangements of infrastructure and cable burial.
June 2022	The Planning Inspectorate Scoping opinion.	<ul style="list-style-type: none"> Advice on matters to be scoped into the EIA Assessment of underwater sound and indirect impacts on commercial fisheries Assessment of the risk of introduction and spread of invasive non-native species and potential impacts on commercial fisheries.
June 2022	Marine Management Organisation (Marine Licensing) Scoping opinion	<ul style="list-style-type: none"> Advice on matters to be scoped into the EIA.
November 2022	Individual static gear operator from Fleetwood Consultation meeting.	<ul style="list-style-type: none"> Queries regarding noise impacts on whelk Queries regarding spacing arrangements of infrastructure and potential for co-existence during the operations and maintenance phase. Static gear vessels lay gear in a north – south alignment within the Morgan Array Area. Preference for equally spaced wind turbines in rows and as far apart as possible.
November 2022	SFF, SWFPA and WCSP. Consultation meeting.	<ul style="list-style-type: none"> Discussions regarding spacing arrangements of infrastructure and potential for co-existence during the operations and maintenance phase. Noted higher density queen scallop ground in the southwest part of the Morgan Array Area Discussion regarding arrangement of inter-array cable and burial depth to allow scallop fishing during operations and maintenance phase. Gear penetration can vary between 0.05 to 0.25 m

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Date	Consultee and purpose of consultation	Topics raised
		<ul style="list-style-type: none"> Queries regarding impacts on scallop stocks as a result of changes to tidal flow from the installation of wind turbines.
November 2022	MFPO Consultation meeting.	<ul style="list-style-type: none"> Queries regarding spacing arrangements of infrastructure and potential for co-existence during the operations and maintenance phase. Noted that the Manx fishing vessels only use approximately 100 ft of cable, so are able to fish between wind turbines Discussion regarding arrangement of inter-array cable layout and burial depth to allow scallop fishing during operations and maintenance phase Queries regarding impacts on scallop stocks as a result of construction and changes to tidal flow from the wind turbines and foundations.
November 2022	Rederscentrale Consultation meeting.	<ul style="list-style-type: none"> Queries regarding spacing arrangements of infrastructure and potential for co-existence during the operations and maintenance phase. Noted that fishing between wind turbines of 1 km is difficult due to safety reasons. Noted that Rederscentrale vessels do not fish within the Morgan Array Area; their fishing activity is mostly to the east of the Morgan Array Area Discussion regarding arrangement of inter-array cable layout and burial depth. Noted that Rederscentrale's beam trawl vessels that operate within the Irish Sea are using a newer gear technology which does not penetrate as deep into the seabed.
November 2022	ANIFPO, NIFPO, WFA Consultation meeting.	<ul style="list-style-type: none"> Queries regarding spacing arrangements of infrastructure and potential for co-existence during the operations and maintenance phase. Orientation of wind turbines in a north to south alignment would be preferable Queries regarding timings of surveys to minimise impacts on fish stocks Concerns that VMS data does not capture smaller vessels.
November 2022	ISEFPO Consultation meeting.	<ul style="list-style-type: none"> Queries regarding spacing arrangements of infrastructure and potential for co-existence during the operations and maintenance phase Discussion regarding arrangement of inter-array cable and burial depth and queries regarding snagging risk.
November 2022	Individual fishing operators from Conwy Consultation meeting	<ul style="list-style-type: none"> Queries regarding co-existence during the operations and maintenance phase, particularly related to the offshore cable corridor, due to the areas of fishing activity Discussion regarding spatial squeeze on fishing vessels due to changes in ferry routes as a result of the Morgan Array Area Queries regarding impacts on fish stocks.
December 2022	SFF, SWFPA and WCSP. Consultation meeting.	<ul style="list-style-type: none"> Discussions regarding spacing arrangements of infrastructure and potential for co-existence. Preference for packed boundary to avoid turbines in queen scallop area, in the central part of the Morgan Array Area Queries regarding how the turbines will affect the physical processes in the water column and subsequent impacts on fish stocks.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Date	Consultee and purpose of consultation	Topics raised
May 2023	Individual fisher from Lytham Public consultation meetings.	<ul style="list-style-type: none"> Group of five fishermen in Lytham Fish for mussels and flat fish from the sea wall at Lytham Queries regarding impacts on fish stocks during construction.
June 2023	SFF, SWFPA and WCSP S42 Responses (responses received have been grouped here due to similar themes)	<ul style="list-style-type: none"> Potential co-existence options: position of turbines and inter-array cables away from tows; north to south routing of inter-array cables; tightly packed turbines around array boundary and fewer larger turbines within the array; cable protection material to be similar to the seabed substrate; phased approach to construction and avoiding queen scallop fishing area Advised that rock dumping over the cable array layout would be detrimental to the Queen Scallop habitat and would be a challenge to tow Queen Scallop gear. Commented that the backfilling of trenches/cables in this area is restored of sandy/gravelly substrate.
June 2023	Isle of Man (IoM) Government S42 Response	<ul style="list-style-type: none"> Commented that not all datasets include vessels <12 m in length, particularly IoM vessels, and noted importance of capturing fishing activity for this group. All IoM mobile gear vessels have VMS fitted. Data for IoM vessels could be obtained from various sources, including IoM Government, MFPO or Manx fishermen directly. Provided examples of data that could be requested from DEFA While it is not expected to be comprehensive, restricted data presentation should be more thoroughly explained if the reports are to be considered reasonably representative and provide comfort of due consideration Four-year baseline is not sufficient to assess fisheries given the disruption between 2019 to 2022 resulting from Brexit, Covid-19 and the fuel/energy crisis Correction to the number of scallop vessels registered in IoM and the number of vessels licenced to fish for scallops in IoM waters (including UK) Asked for clarification of which datasets include Isle of Man vessels Commented that data presented doesn't give context for the wider queen scallop fishery areas Advised for the inclusion of the Isle of Man Offshore Wind Farm and Crogga O&G development in the cumulative impact assessment Noted that an estimated economic loss to businesses of 5-20% is considered as low magnitude and no mitigation suggested Suggested that downstream economic multipliers (Type I and Type II) are incorporated into the assessment of impacts on fishing activity, using peer-reviewed economic multiplier analysis where possible, in order to capture to full economic impact. Seafish has done work in this area Given the inter-array minimum burial depth of 0.5 m and potential for seabed cable protection, it was queried how likely is it that benthic dredging will practically continue within the Morgan Array Area and if monitoring of fishing patters during and post-construction will be undertaken

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Date	Consultee and purpose of consultation	Topics raised
		<ul style="list-style-type: none"> Queried what the expected outcome is if monitoring shows a change.
June 2023	Natural England	<ul style="list-style-type: none"> Natural England advises that the potential impacts of the Morgan Generation Assets cannot be considered in isolation from its transmission assets.
June 2023	NFFO and WFA S42 Responses	<ul style="list-style-type: none"> The PEIR chapter characterised the commercial fishing industry well and effort has been made to describe the fisheries using a variety of sources. Raised some remaining issues with how these data have been interpreted and used to assess the impacts to the diverse fishing fleets that are the current users of the area Noted spatial squeeze on fisheries in east Irish Sea due to other projects and restrictions on mobile gear within Marine Conservation Zones. Also noted the factors associated with the re-negotiation of the Trade and Cooperation Agreement which will affect fishing opportunities in the region Noted that an estimated economic loss to businesses of 5-20 % is considered as low magnitude and no mitigation suggested Whilst there is a commitment to follow FLOWW Guidelines (2014) for liaison and disruption agreements, these are under review, and we would like to see this acknowledged and a commitment made to follow the most up to date guidelines Queried what are the protocols to be followed are if an effect is observed during monitoring.
June 2023	NIFPO S42 Responses	<ul style="list-style-type: none"> Concerns regarding underwater sound impacts to spawning herring and crustaceans The NIFPO does not considered that the development of a Fisheries Liaison and Co-existence Plan will provide assurances over negligible or minor adverse impacts to commercial fisheries Queried what additional mitigation is proposed Queried if displacement to commercial fisheries is only assessed during the construction phase.
June 2023	Moor Vannin Offshore Wind Limited S42 Responses	<ul style="list-style-type: none"> The Moor Vannin Offshore Windfarm should be screened in to the CEA.
June 2023	Barrow Offshore Windfarm S42 Responses	<ul style="list-style-type: none"> Registered their interest in the Morgan Generation Assets and noted any interactions with the Barrow Offshore Windfarm should be noted.
June 2023	West of Duddon Sands Windfarm S42 Responses (summarised)	<ul style="list-style-type: none"> Registered their interest in the Morgan Generation Assets and noted any interactions with the West of Duddon Sands Windfarm should be noted.
June 2023	Individual fishing operator from Lytham S42 Responses (summarised)	<ul style="list-style-type: none"> Group of 5 fishermen in Lytham Fish for mussels and flat fish from the sea wall at Lytham Queries regarding impacts on stocks during construction.
September 2023	SWFPA and WCSP (SFF invited but did not attend).	<ul style="list-style-type: none"> Queries regarding cable laying and if there will be large areas of closure, due to cables being laid down and being buried later

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Date	Consultee and purpose of consultation	Topics raised
	Consultation meeting – S42 response discussion and update on spacing arrangements of infrastructure.	<ul style="list-style-type: none"> Queries regarding rock protection particularly in an area free of surface infrastructure and the potential impact this would have on the key scallop area within the Morgan Array Area Noted preference of no cables across an area free of surface infrastructure.
September 2023	TN Trawlers. Consultation meeting – S42 response discussion and update on spacing arrangements of infrastructure.	<ul style="list-style-type: none"> Regarding cable burial depth and fishing gear penetration depth, noted that scallop fishing gear tooth bars are 9-10 inches long Price of steel has increased costs on gear requirements and maintenance, as well as price of fuel Noted no major concerns with information presented.
September 2023	MFPO and IoM Government. Consultation meeting – S42 response discussion and update on spacing arrangements of infrastructure.	<ul style="list-style-type: none"> Raised that the proposed construction approach of rolling construction zones around installation vessels may still have potential impacts due to tow directions, wind conditions, tides, etc Noted that there are seasonal closures within the Isle of Man Territorial Sea for both king and queen scallop to protect spawning periods. King scallop: from 01 June to 31 October; and queen scallop from 01 April to 30 June. A curfew also exists within the Isle of Man Territorial Sea, with fishing for king scallop prohibited between 18:00 and 06:00 Noted that Brexit has affected costs rather than markets. Peruvian queen scallop market is a factor in prices Noted that queen scallop vessels fish with nets (not dredgers) and lighter gear, and so are less likely to be impacted than scallop fishers with heavier gear.
September 2023	Rederscentrale. Consultation meeting – S42 response discussion and update on spacing arrangements of infrastructure.	<ul style="list-style-type: none"> Queries raised regarding rock protection in areas where the minimum burial depth of cable has not been achieved within the Morgan Array Area Confirmed that 90% of the Belgian fleet active within the Morgan Generation Assets commercial fisheries study area deploy beam trawls using SumWing technology Confirmed that sole is the target species
September 2023	NFFO, NFFO Services, Whitehaven Fishermen's Cooperative, P&M Fishing and the MMO. Consultation meeting – S42 response discussion and update on spacing arrangements of infrastructure.	<ul style="list-style-type: none"> Noted that the rolling construction zones around installation vessels is a step in the correct direction. However, raised a concern to the level of liaison needed for this approach to construction, which needs to be reflected in the Fisheries liaison and co-existence plan Queries raised regarding displacement through cumulative development within the Irish Sea.
September 2023	Seafish and individual fishing operators from Blackpool. Consultation meeting – S42 response discussion and update on spacing arrangements of infrastructure.	<ul style="list-style-type: none"> Queries regarding cable burial and the potential for a snagging risk Queried the type of scour protection being considered and raised that limestone may be incompatible with mussel settlement.
September 2023	Individual fishing operators from Conwy	<ul style="list-style-type: none"> Queries raised regarding displacement and spatial squeeze as a result of other projects within the Irish Sea

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Date	Consultee and purpose of consultation	Topics raised
	Consultation meeting – S42 response discussion and update on spacing arrangements of infrastructure.	<ul style="list-style-type: none"> Noted that prices of production have increased which has an impact on the price of shellfish Raised a concern regarding noise impacts on fish species and stock.
October 2023	ISEFPO Consultation meeting – S42 response discussion and update on spacing arrangements of infrastructure.	<ul style="list-style-type: none"> Queries raised regarding cable burial, rock protection and the potential for a snagging risk Agreed to provide additional information on scallop grounds fished by Irish vessels.
October 2023	ANIFPO Consultation meeting – S42 response discussion and update on spacing arrangements of infrastructure.	<ul style="list-style-type: none"> Queries raised in reference to a windfarm off Blackpool, where ANIFPO members were told that they were no longer allowed to fish within the array area Queries raised regarding the cumulative impact on fisherman, potential displacement and any potential future policy changes that could prevent fishing within the array area. Potential that this could lead to displacement of fishing activity into more confined areas Queries raised regarding the impact of windfarms on fish species and stocks. Species disappearing from site where they used to be prolific, queries raised of potential impact.
October 2023	NIFPO Consultation meeting – S42 response discussion and update on spacing arrangements of infrastructure.	<ul style="list-style-type: none"> Queried whether there is differentiation between dredge or net fishing methods for queen scallop, highlighting that the effects would be different for each.

1.3.3 Site-specific surveys

- 1.3.3.1 A summary of the surveys used to inform the commercial fisheries baseline is outlined in Table 1.3. A confidence level has been assigned to each dataset, informed by expert judgment and based on the various data limitations (e.g., age of dataset, spatial resolution and size of vessels included); this is described below for each dataset. Care has been taken when interpreting the data, particularly those with lower confidence levels.
- 1.3.3.2 NASH Maritime was commissioned to undertake two project-specific 14 day marine traffic surveys of the Morgan Array Area, in November 2021 to December 2021 and June 2022 to July 2022 to inform the Navigation Risk Assessment being undertaken as part of wider EIA studies. In addition to visual records collected via these surveys, AIS and radar data was also collected from the same time periods to supplement the visual observations. AIS data included information on date, average speed, destination, ship name, ship category, length and draft. Radar data included information on vessel type and date. Although this data was collated during different seasons to account for seasonal variation and peak times in marine traffic and fishing activity, it is limited by the short time period captured. Therefore, it has only been used to supplement the official datasets and feedback from consultation with fisheries stakeholders. Data has been assessed with medium confidence.
- 1.3.3.3 Additional 14 day marine traffic surveys were undertaken by NASH Maritime in May 2023, August 2023 and November 2023, to address concerns raised by shipping and navigation stakeholders. Although the August 2023 survey was undertaken as part of

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

the Morgan and Morecambe Offshore Wind Farms: Transmission Assets and fishing activity was not observed to overlap with the Morgan Array Area during the survey period (03 to 17 August 2023), it has been discussed in this technical report to provide context to fishing activity to the area around the Morgan Generation Assets (section 1.4.9).

- 1.3.3.4 The 2023 vessel traffic surveys listed in Table 1.3 were undertaken to gather data on interactions between ferry operators and fishing vessels in the area between the Morgan Array Area and the Isle of Man. The data from this survey has been presented in this technical report to provide context to more recent fishing activity within and in proximity to the Morgan Array Area. This data, however, is limited by the short time period captured and has only been used to supplement the official datasets and feedback from consultation with fisheries stakeholders. This data has been assessed with medium confidence.
- 1.3.3.5 An Offshore Fisheries Liaison Officer (OFLO) was present on the offshore geophysical, environmental and geotechnical survey vessels during the 2021 and 2022 survey operations. During 2021, only the Morgan Array Area, plus a 3 km buffer, was surveyed. During the 2022 surveys, the Morgan Array Area (plus a buffer of varying distances) was surveyed. The OFLO provided a Daily Progress Report with information on the presence of any fishing vessels, fishing vessel type, location of vessel, name of vessel and whether the vessels were transiting or not. This data is only provided as point data, so does not show individual fishing vessel tracks. This data is also limited by the time period captured and the limited areas captured, so has been used to supplement other datasets. This data has been assessed with medium confidence.
- 1.3.3.6 Locations of static gear were also recorded by the OFLO which have been used to inform the EIA, particularly as static gear vessels are generally not captured within the VMS data due to their size. Exact locations of static gear have not been displayed within this technical report, due to commercial sensitivities. Data has been assessed with low-medium confidence.
- 1.3.3.7 During the 2022 surveys, where an OFLO was unable to be present on a survey vessel, MarineSpace undertook daily remote fisheries monitoring via the www.marinetraffic.com website. These remote fisheries monitoring observations are limited to vessels which have AIS active, are limited by the time period at which the AIS was monitored and are also limited by the area of capture. MarineSpace was able to observe fishing vessel patterns and add point data which is presented in this technical report to supplement official datasets. Data has been assessed with low-medium confidence.

Table 1.3: Summary of surveys used to inform commercial fisheries.

Title	Extent of survey	Overview of survey	Survey contractor	Date	Reference to further information
OFLO observations 2021	Commercial fisheries study area plus 10 nm	OFLO onboard the survey vessel recorded observations of fishing vessels and fishing gear present.	NFFO	30 June to 18 September 2021	Refer to Figure 1.66

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Title	Extent of survey	Overview of survey	Survey contractor	Date	Reference to further information
Winter vessel traffic survey 2021	Morgan Array Area plus 10 nm	AIS and radar.	NASH Maritime	21 November to 04 December 2021	Volume 2, Chapter 7: Shipping and navigation of the Environmental Statement; Volume 4, Annex 7.1: Navigational risk assessment of the Environmental Statement Section 1.4.9.
Summer vessel traffic survey 2022	Morgan Array Area plus 10 nm	AIS and radar.	NASH Maritime	15 July to 29 July 2022	Volume 2, Chapter 7: Shipping and navigation of the Environmental Statement; Volume 4, Annex 7.1: Navigational risk assessment of the Environmental Statement Section 1.4.9.
OFLO observations 2022	Commercial fisheries study area plus 10 nm	OFLO onboard the survey vessel recorded observations of fishing vessels and fishing gear present.	NFFO	01 April to 10 July 2022	Section 1.4.9.
MarineSpace observations 2022	Commercial fisheries study area plus 10 nm	Fisheries monitoring using AIS data (via www.marinetraffic.com).	MarineSpace	10 July to 30 November 2022	Section 1.4.9.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Title	Extent of survey	Overview of survey	Survey contractor	Date	Reference to further information
Spring vessel traffic survey 2023	Morgan Array Area plus 10 nm	AIS and radar.	NASH Maritime	04 May to 18 May 2023	Volume 2, Chapter 7: Shipping and navigation of the Environmental Statement; Volume 4, Annex 7.1: Navigational risk assessment of the Environmental Statement. Section 1.4.9.
Summer vessel traffic survey 2023	Morgan and Morecambe Offshore Wind Farms: Transmission Assets	AIS and radar.	NASH Maritime	03 August to 17 August 2023	Volume 2, Chapter 7: Shipping and navigation of the Environmental Statement; Volume 4, Annex 7.1: Navigational risk assessment of the Environmental Statement Section 1.4.9.
Morgan Generation Assets top up vessel traffic survey 2023	Morgan Array Area	AIS and radar.	NASH Maritime	11 November to 27 November 2023	Volume 2, Chapter 7: Shipping and navigation of the Environmental Statement; Volume 4, Annex 7.1: Navigational risk assessment of the Environmental Statement Section 1.4.9.

1.4 Baseline environment

1.4.1 Regional overview

1.4.1.1 Commercial fishing in the east Irish Sea region has a wide spatial distribution and targets a number of valuable fisheries for demersal, pelagic and shellfish species. Key shellfish species include; king scallop and queen scallop which are targeted by dredges; and whelk, lobster and crab, which are targeted by pots. The most important demersal target species include bass, sole, thornback ray and plaice, which are typically caught by beam and otter trawlers. Pelagic fish landings from this area are mainly of herring and mackerel, which are predominantly caught by pelagic trawls.

1.4.1.2 Up to 31 December 2020, commercial fisheries within UK waters, including the Irish Sea region were managed through the EU Common Fisheries Policy (CFP), with fisheries of some stocks managed by the North East Atlantic Fisheries Commission and by coastal state agreements. Since the withdrawal of the UK from the EU on the 31 December 2020, the new EU-UK Trade and Cooperation Agreement stipulates that there will be a five-year transition phase, whereby 25% of the EU quota for British waters will be transferred to the UK fishing fleet. Implications on the commercial fisheries baseline are discussed further in section 1.5.

1.4.2 Overview of the commercial fisheries study area

1.4.2.1 Fishing ports in the commercial fisheries study area with the highest value (£) of landings are Fleetwood, Douglas, Peel, Port St Mary and Ramsey. Fishing vessels that are active in the Morgan Generation Assets commercial fisheries study area are also based out of a number of ports across the wider region, including Annan, Douglas, Kilkeel, Kirkcudbright, Maryport and Peel; activity from these vessels is included in this technical report. Within the commercial fisheries study area, Fleetwood had the highest value (£) of landings in England between 2009 and 2020 (MMO, 2021a). There are 16 vessels with Fleetwood as their home port, eight of which are ≤10 m and eight of which are >10 m in length (MMO, 2023b).

1.4.2.2 Within the Morgan Generation Assets commercial fisheries study area, the key commercial fishing fleets identified were:

- Dredging and trawling for king scallop and queen scallop
- Potting for whelk, crab and lobster
- Beam trawling for flatfish and other demersal finfish
- Trawling for herring
- Trawling for *Nephrops* (Norway lobster).

1.4.2.3 Other important fisheries in the region include harvesting for cockles and mussels within the shallow bays and traditional shrimp fisheries targeted by beam trawlers (Walmsley and Pawson, 2007). Harvesting for mussels within Morecambe Bay has been taking place for a number of years, and since 1992, Morecambe Bay has become one of the major sources of seed mussels within the UK.

1.4.2.4 A summary of each of the key regional fisheries is provided below.

Dredging and trawling for king scallop and queen scallop

1.4.2.5 Within the commercial fisheries study area, Isle of Man and UK registered scallop vessels from a variety of English, Welsh, Northern Irish, Scottish and Isle of Man ports

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

are active. Vessels from the Republic of Ireland are also active in this region, targeting both species of scallop, as well as whitefish and shellfish. Dutch vessels also catch king scallop within the commercial fisheries study area. These species are primarily targeted using towed dredges and otter trawls, by vessels ranging in size from <10 m to 25 m length.

- 1.4.2.6 The scallop industry in the UK is one of the highest value commercial fisheries (Cappell et al., 2018) and a large proportion of landings are caught in the Irish Sea. Scallop are a non-quota species and, therefore, not subject to Total Allowable Catch (TAC) limits (excluding in Isle of Man waters), however there are technical management measures and Minimum Landings Sizes (MLS) in place. There are restrictions on the number of dredges used, which depend on the distance from the coast. Beyond 12 nm, there are no regulatory limits on the maximum number of dredges permitted to be towed behind a vessel. Instead, the number of dredges is limited by the size and engine capacity of the fishing vessels. There are also seasonal closures within the Irish Sea for both king and queen scallop to protect the spawning periods, as outlined in Table 1.4.

Table 1.4: Seasonal closures of the scallop fisheries by administration.

	King scallop closures	Area of closure	Queen scallop closures	Area of closure
England	01 June to 31 October	Irish Sea closed area	01 April to 30 June	ICES area VIIa
Isle of Man	01 June to 31 October	Isle of Man Territorial Sea	01 April to 30 June	ICES area VIIa
Wales	01 May to 31 October	Within 1 nm of the baseline and specified bays	n/a	n/a

- 1.4.2.7 It has been established through project-specific fisheries consultation that there are approximately 11 vessels based in Kirkcudbright, Scotland, that fish for queen and king scallop within the commercial fisheries study area: most notably for queen scallop within the Morgan Array Area. WCSP is a business based in Kirkcudbright that has six vessels, 40 fishermen and 100 factory staff. There are also Scottish scallop vessels active in the Irish Sea from Annan, and several large (14 m to 24 m) Scottish nomadic vessels (Cappell et al., 2018).
- 1.4.2.8 Feedback from project specific consultation has established that at the time of writing there are 55 vessels licenced to fish for king scallop in Isle of Man waters (29 of which are Isle of Man registered vessels) and 36 that can fish for queen scallops (25 of which are Isle of Man registered vessels). Due to the size and capacity of the Manx vessels, it is expected that the majority of these vessels will not fish beyond the Manx 12 nm. The majority of these vessels have a licence for both king and queen scallop. There are also multiple businesses on the Isle of Man which process scallops. More information on the spatial distribution of scallop vessels licenced to operate in Manx waters is provided in section 1.4.8.16.
- 1.4.2.9 A 2018 study found that in the Irish Sea, 59 vessels targeting scallop land into Northern Irish ports (Cappell et al., 2018); however, it is unlikely that all these vessels are active within the commercial fisheries study area, particularly given that 53% of these vessels are under 12 m in length.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

- 1.4.2.10 It has been established through project specific fisheries consultation that there are also several Irish vessels which are active in the area, predominantly between December to Spring.
- 1.4.2.11 Welsh vessels based in north Wales/Anglesey are also active in this region at certain times of year, transiting from scallop grounds off the Welsh coast (Cardigan Bay) to this area as/when market forces demand.
- 1.4.2.12 English scallopers, from as far as the southwest region (Cornwall/Devon), also fish in these areas at times, in a similar, nomadic, fashion to the Welsh vessels.
- 1.4.2.13 Whereas king scallop grounds are relatively extensive around the UK (WGSCALLOP 2020) the major queen scallop beds are within the Irish Sea. Queen scallop are generally found in sandy gravelly substrates, whereas king scallop can be found in rougher sediments. The biology and behaviour are different between the two species, and this is discussed further in Volume 4, Annex 3.1: Fish and shellfish ecology technical report of the Environmental Statement. Generally, queen scallop is more mobile than king scallop, which influences the gear types used to catch them, as discussed in section 1.4.6. Further information on the spatial extent of these grounds is also discussed within this technical report (sections 1.4.8 and 1.4.9).

Potting for whelk, crab and lobster

- 1.4.2.14 Potting for whelk, crab (brown and spider crab) and lobster occurs across the commercial fisheries study area (Walmsley and Pawson, 2007).
- 1.4.2.15 The whelk fishery in the Irish Sea has expanded significantly over the last two decades (Duncan and Emmerson, 2018). Whelk are landed all year around, and vessels operate across the inshore and offshore parts of the commercial fisheries study area. Highest landings in terms of weight and value are generally during the summer months, which may be, partly, due to lower scallop vessel activity as a result of seasonal closures. Whelk operators land into both English and Welsh ports. MMO landings data indicate that a vessel from Jersey, which predominantly targeted whelk, was active within the commercial fisheries study area. However, such activity was observed at a relatively low level (Figure 1.28), and landings within the commercial fisheries study area have not been observed since 2017 (MMO, 2023a).
- 1.4.2.16 It is evident through project specific consultation that one of the main whelk operators in the region is based out of Fleetwood and has four vessels that are active within the Morgan Array Area.
- 1.4.2.17 Lobster is generally caught close to the coast in rocky areas. Brown crab is caught within both inshore and offshore parts of the commercial fisheries study area.
- 1.4.2.18 There are no TACs or quotas for whelk, crab or lobster, however all are subject to an MLS.

Beam trawling for flatfish

- 1.4.2.19 The Irish Sea has been an important traditional fishing ground for beam trawl vessels for many decades (NWWAC, 2013). Flatfish, specifically sole, is the main catch for these vessels. Through project specific consultation with fisheries stakeholders, it has been established that there are several large Belgian beam trawl vessels, and one vessel from the southwest of England, that are active in the commercial fisheries area. The grounds targeted for flatfish are generally to the east of the Morgan Array Area and are predominantly fished during the Spring period.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

- 1.4.2.20 There are TACs in place for sole, and ICES stock assessments highlight that sole stocks have increased in size in the Irish Sea, over recent years (ICES, 2021a).

Trawling for herring

- 1.4.2.21 The Irish Sea herring fishery is located in the region around the Isle of Man. Herring are targeted by a mix of gear types, including mid-water trawls, pelagic trawls, and purse seine nets. Within inshore waters, gillnets may be used to catch herring. Project specific consultation with fisheries stakeholders indicated that there are at least three pelagic trawlers from Northern Ireland, and two from England, that mostly engage in the herring fishery in the commercial fisheries study area.
- 1.4.2.22 Following the collapse of the herring stocks in the Irish Sea during the 1980s, annual closures have been brought in to protect spawning and nursery grounds (see also Volume 4, Annex 3.1: Fish and shellfish technical report of the Environmental Statement). The Douglas Bank area (south and east of the Isle of Man) is closed between 21 September and 15 November, although gill nets are excluded from this.
- 1.4.2.23 Herring is subject to TACs, and ICES advice recommends a 15% increase in the TAC for 2022 (ICES, 2021b). Since Brexit, the UK has gained a greater share in the Irish Sea herring quota. Following engagement between the Isle of Man Government, MFPO and the UK Government, a new deal has been agreed that allows for commercially viable quantities of herring to be caught by Isle of Man vessels within Manx territorial waters. The Isle of Man has been allocated 100 t of annual quota for herring from 2023. The Isle of Man has also been allocated a 100 t annual quota for langoustines, from 2024. This agreement will allow the Manx fishery to diversify and become less commercially reliant upon scallop.

Trawling for Nephrops

- 1.4.2.24 The Irish Sea is an important fishing ground for Nephrops (also known as Norway lobster), particularly around the Irish and Cumbrian coast, and is targeted by a mix of both beam and otter trawls. Project-specific consultation with fisheries stakeholders indicated that while there are Nephrops fisheries within the commercial fisheries study area, none have been noted within the Morgan Array Area. The Nephrops fishery is mostly targeted by Northern Irish and Scottish vessels or local English vessels.
- 1.4.2.25 Nephrops are subject to TACs, based on the aggregate total tonnage of removals recommended by relevant ICES Working Groups for separate ICES Rectangles. There are byelaws which restrict the type of trawl that can be used for catching Nephrops, as well as restrictions on vessel specifications (e.g. engine size and vessel length).

1.4.3 Overview of landings

- 1.4.3.1 A total of 168,145 t was landed by English, Isle of Man, Northern Irish, Scottish, Welsh and Jersey vessels across the commercial fisheries study area (ICES Rectangles 36E5, 36E6, 37E5 and 37E6), between 2012 to 2022, with Scottish vessels landing the largest proportion of total weight of fish caught by UK vessels (Figure 1.2) (MMO, 2023a).
- 1.4.3.2 A total of 7,492 t was caught by Belgian, French, Irish and Dutch vessels across the commercial fisheries study area, between 2006 to 2016, with Irish vessels landing the largest proportion of total weight of fish caught by non-UK vessels (Figure 1.3). The non-UK vessels were active across the commercial fisheries study area, although no nearshore activity was recorded for French vessels in rectangles 36E5, 37E5 and 37E6; and for Dutch vessels in rectangles 36E6, 37E5 and 37E6 (EU STECF, 2017).

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

- 1.4.3.3 Data assessed in this study was divided into classes, dependent on the length of the fishing vessel: ≤ 10 m and >10 m for the MMO data; <10 m, 10 to 15 m and >15 m for the EU STECF data. As expected, for UK and Isle of Man vessels, the largest proportion of vessels was from the >10 m class (Figure 1.2). The smaller vessels (≤ 10 m) were predominantly from England and Isle of Man, reflecting the closer proximity of home ports to these fleets, with relatively small recordings of landings for Scottish, Welsh and Northern Irish vessels.
- 1.4.3.4 As expected, no non-UK vessels <10 m were active across the commercial fisheries study area and the largest proportion of vessels was from the >15 m class (Figure 1.3). Relatively small recordings of landed weight for French, Irish and Dutch vessels of the 10 to 15 m size class were observed between 2010 and 2016.

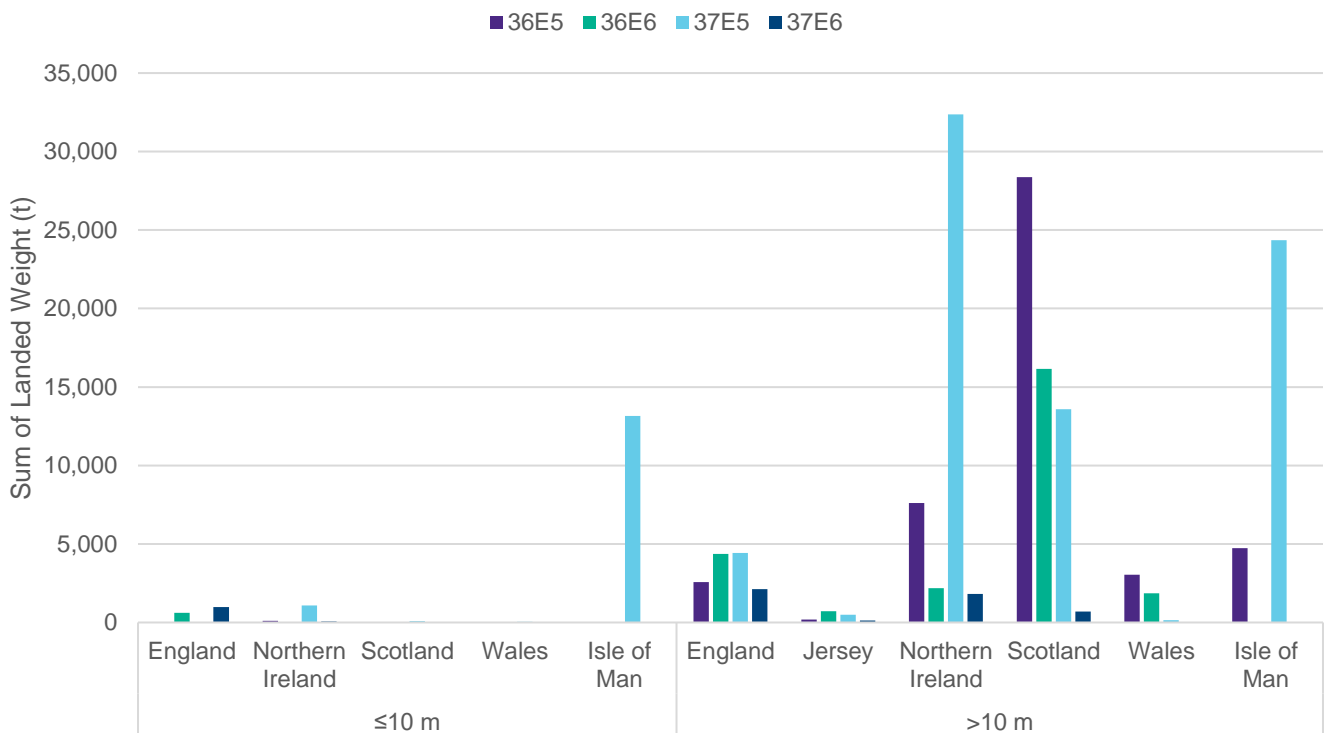


Figure 1.2: Sum of landed weight by vessel size class (2012 to 2022) within the commercial fisheries study area (UK and Isle of Man vessels)².

² MMO, 2023a

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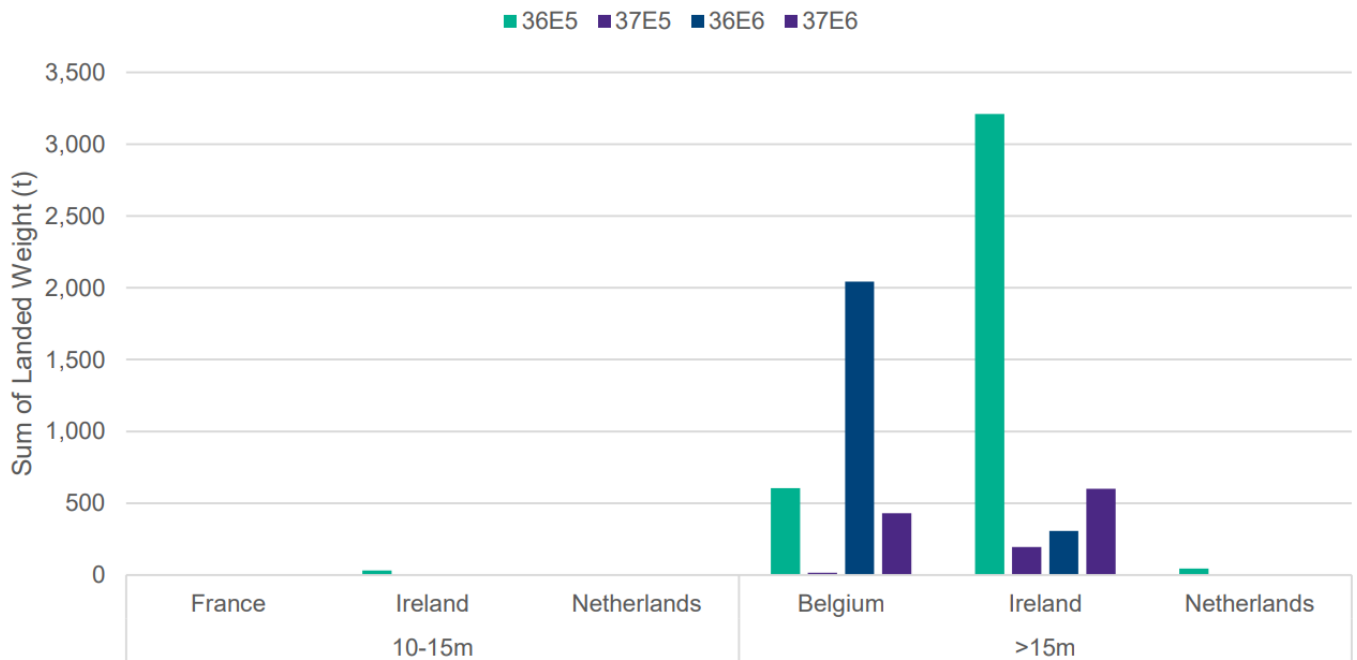


Figure 1.3: Sum of landed weight by vessel size class (2006 to 2016) within the commercial fisheries study area (non-UK vessels)³.

1.4.4 Temporal variation

Annual trends

- 1.4.4.1 The MMO data show that between 2012 to 2022, the sum of landed weight by UK and Isle of Man vessels across from the commercial fisheries study area varied from a minimum of 7,600 t in 2020 to a maximum of 25,842 t in 2012 (Figure 1.4). The sum of landed value varied from a minimum of £11,400,194 in 2020, to a maximum of £26,450,826 in 2016 (Figure 1.5).
- 1.4.4.2 The EU STECF data shows that between 2006 to 2016, the sum of landed weight across the commercial fisheries study area varied from a minimum of 483 t in 2014 to a maximum of 1,097 t in 2006 (Figure 1.6).

³ EU STECF, 2017

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

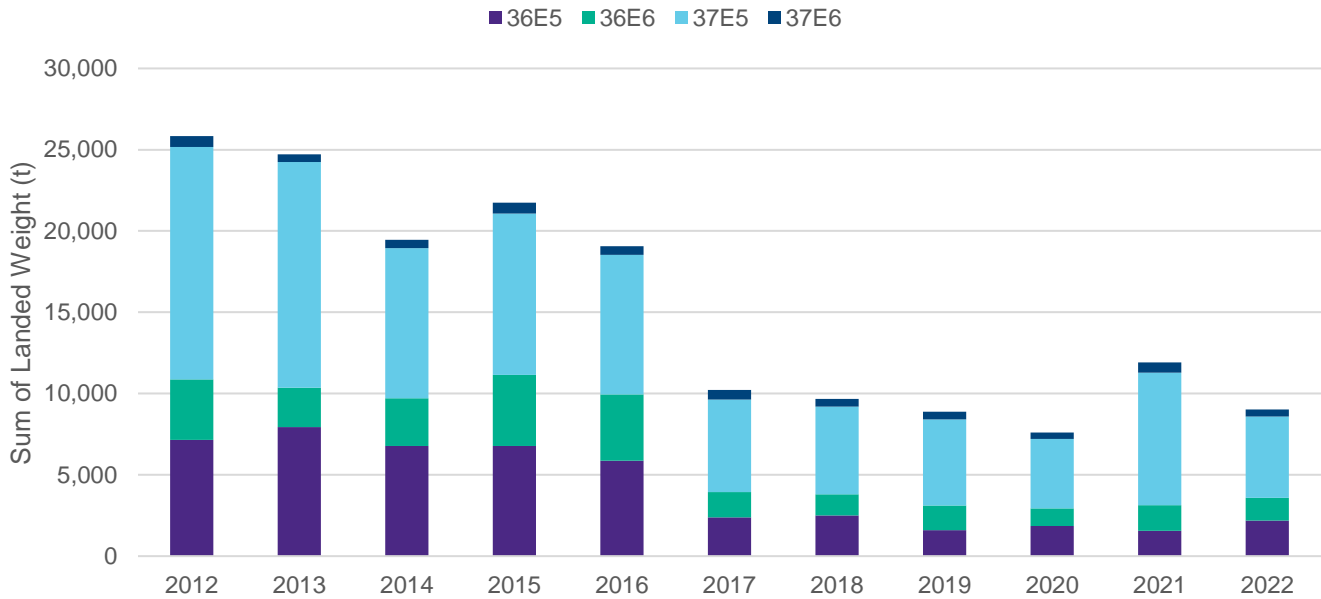


Figure 1.4: Annual trends in landings weight (2012 to 2022) within the commercial fisheries study area (UK and Isle of Man vessels)⁴.

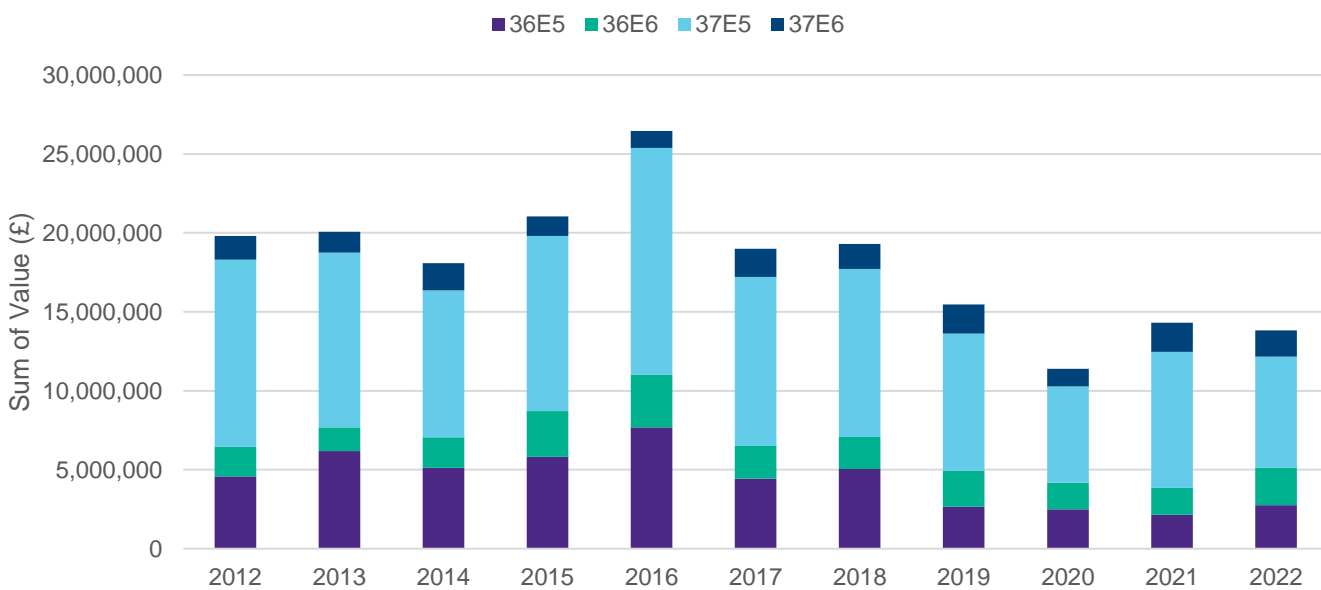


Figure 1.5: Annual trends in sum of landings value (2012 to 2022) within the commercial fisheries study area (UK and Isle of Man vessels)⁵.

⁴ MMO, 2023a

⁵ MMO, 2023a

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

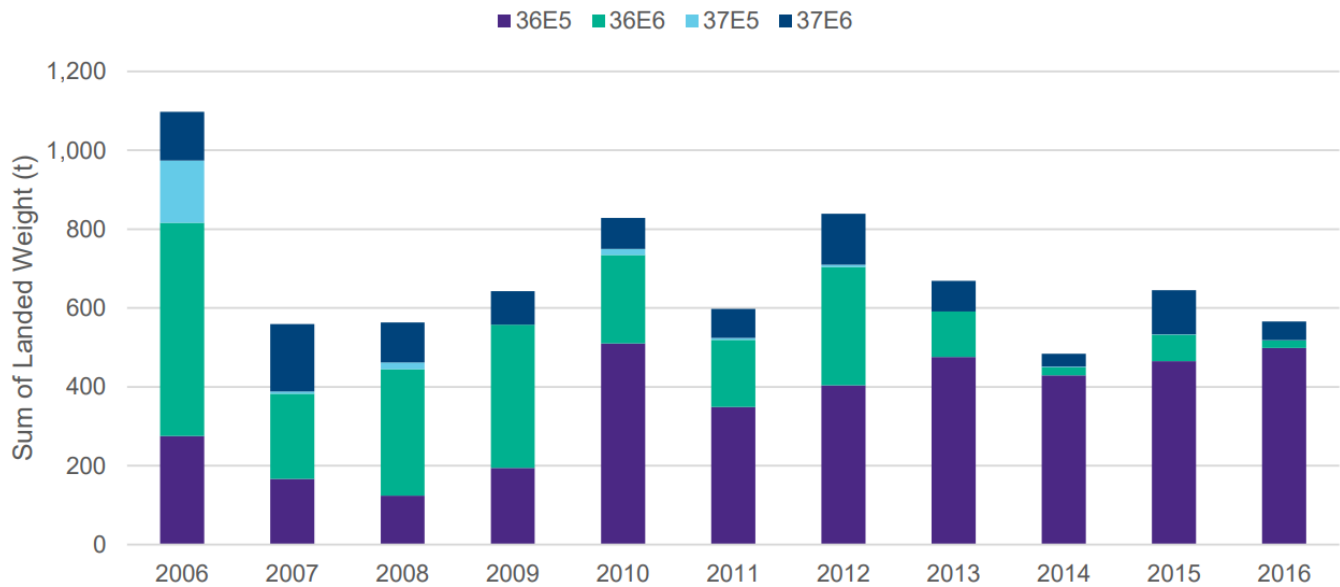


Figure 1.6: Annual trends in sum of landed weight (2006 to 2016) within the commercial fisheries study area (non-UK vessels)⁶.

Seasonal trends

- 1.4.4.3 Across the commercial fisheries study area, the seasonal (intra-annual) range in landed weight (2012 to 2022) by UK and Isle of Man vessels varied from 7,334 t in June to 32,532 t in September (Figure 1.7).
- 1.4.4.4 The landed value followed a similar trend for UK and Isle of Man vessels with the minimum value of £8,661,552 in June and maximum value of £26,735,285 in November (Figure 1.8). With respect to individual rectangles, 36E5 and 37E5 mirrored the overall trend, with peak landings in September and November, whereas 36E6 and 37E6 experienced relatively consistent levels of landings throughout all months. There were lower landings by UK vessels during May to June, which is likely due to seasonal queen scallop closures in the area.
- 1.4.4.5 Across the commercial fisheries study area, the seasonal (intra-annual) range in landed weight (2006 to 2016) by non-UK vessels varied from 838 t during July to September, to 2,615 t during January to March (Figure 1.9). With respect to individual rectangles, 36E5 and 36E6 mirrored the overall trend with peak landings in January to March, April to June and October to December, whereas 37E5 and 37E6 experienced consistently low levels of landings throughout all Quarters. There were lower landings by non-UK vessels during July to September, which was likely due to seasonal scallop closures in the area.

⁶ EU STECF, 2017

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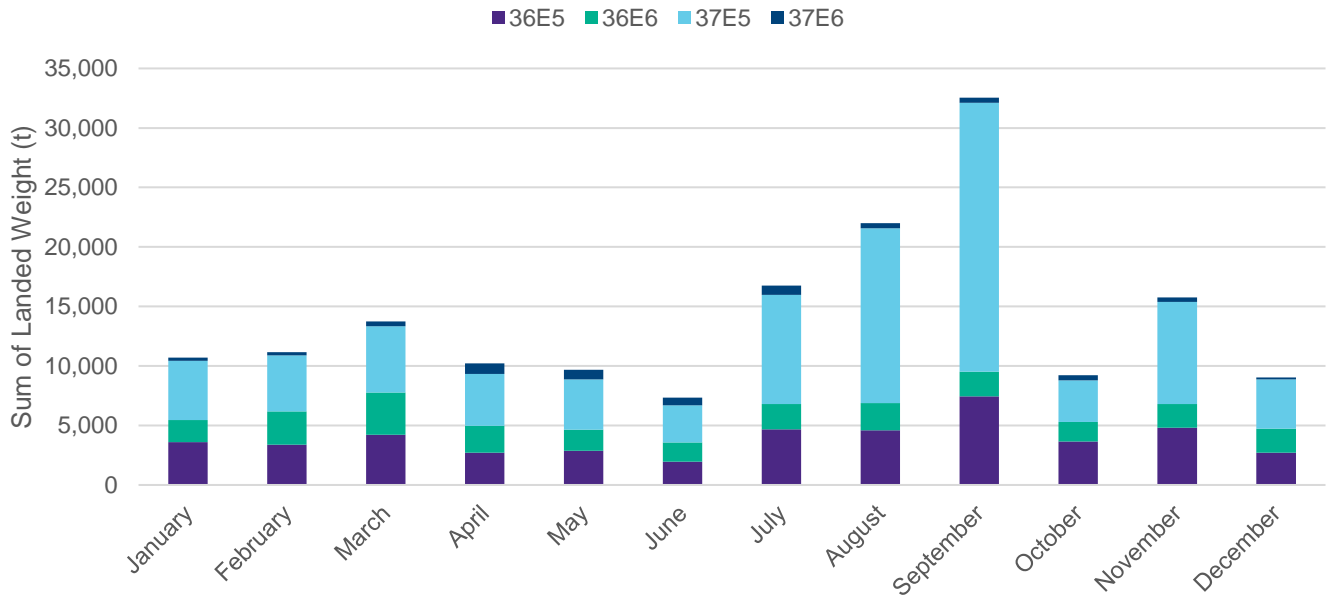


Figure 1.7: Seasonal trends in sum of landed weight (2012 to 2022) within the commercial fisheries study area (UK and Isle of Man vessels)⁷.

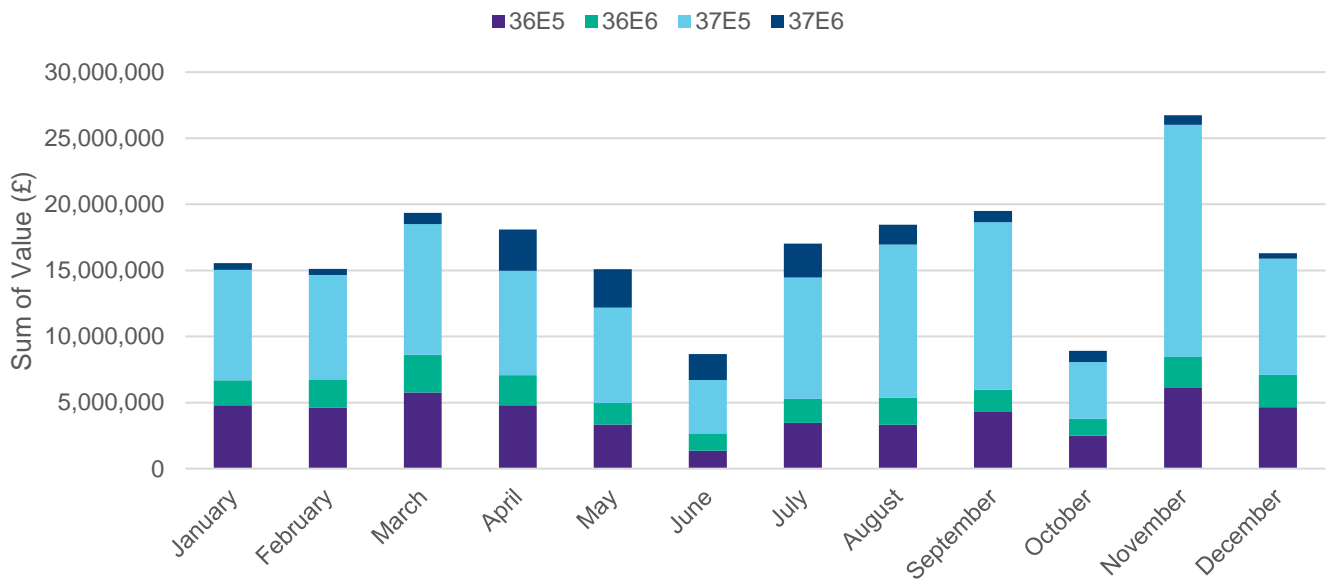


Figure 1.8: Seasonal trends in sum of landed value (2012 to 2022) within the commercial fisheries study area (UK and Isle of Man vessels)⁸.

⁷ MMO, 2023a

⁸ MMO, 2023a

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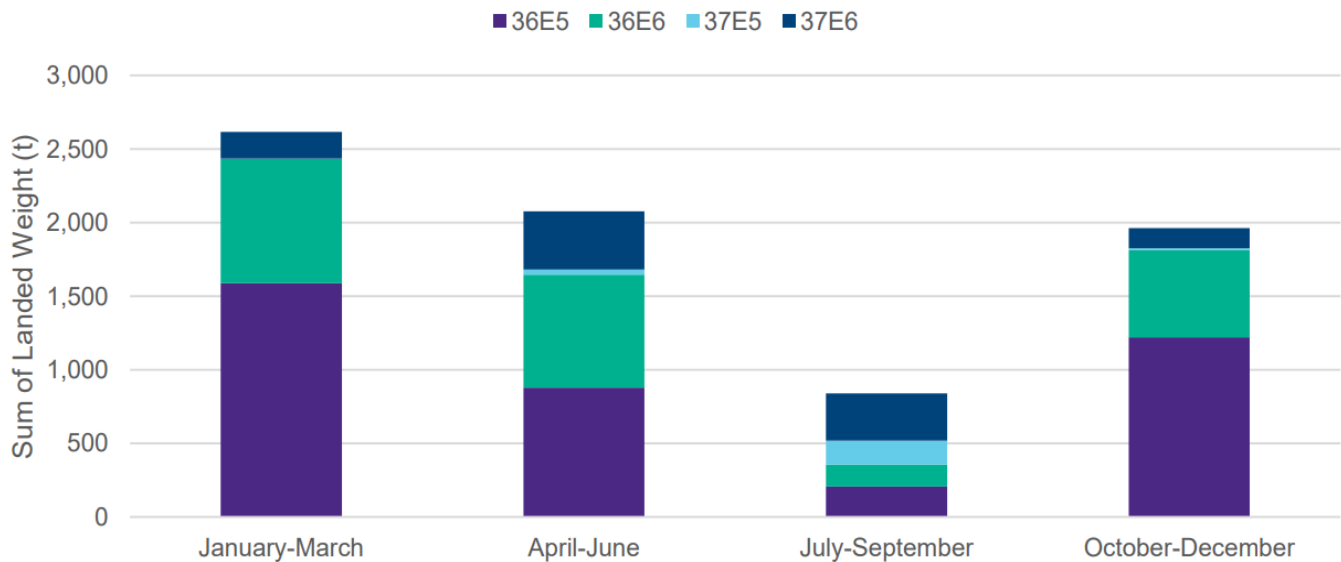


Figure 1.9: Seasonal trends in sum of landed weight (2006 to 2016) within the commercial fisheries study area (non-UK vessels)⁹.

1.4.5 Species

1.4.5.1 The MMO and EU STECF datasets were used to determine the most important species groups and species for UK and Isle of Man, and non-UK vessels in the commercial fisheries study area. Due to the different formats between the two datasets, they are not directly comparable. The EU STECF data does not provide information on species group, so this is only presented for UK and Isle of Man vessels using the MMO data.

Species landed by UK and Isle of Man vessels

1.4.5.2 Shellfish was the most important species group in terms of landed weight and value for UK vessels (Figure 1.10) and Figure 1.11), with the highest landings from ICES Rectangle 37E5. Landings of demersal and pelagic species were significantly lower than shellfish.

⁹ EU STECF, 2017

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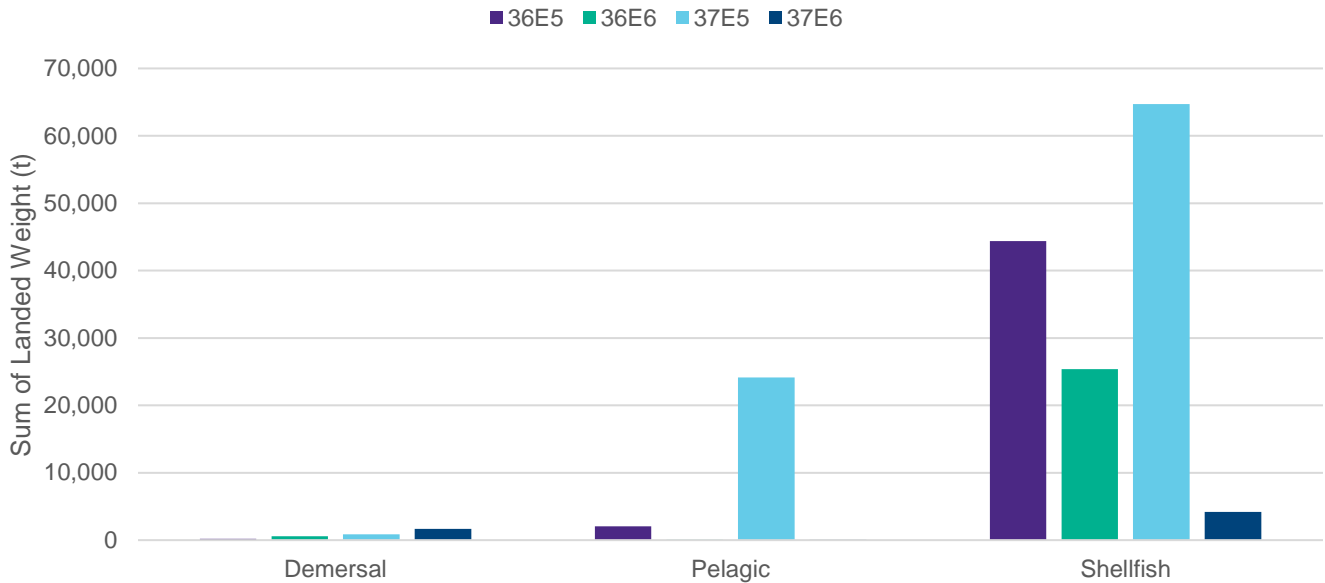


Figure 1.10: Sum of landed weight within the commercial fisheries study area, displayed by species group (2012 to 2022) (UK and Isle of Man vessels)¹⁰.

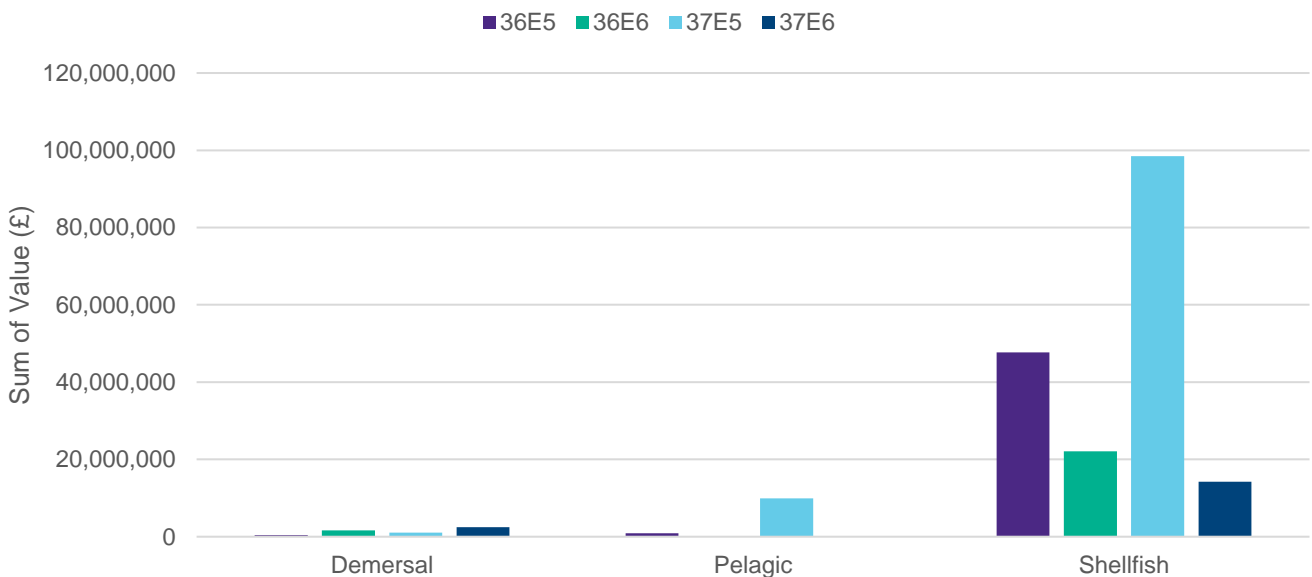


Figure 1.11: Sum of landed value within the commercial fisheries study area), displayed by species group (2012 to 2022) (UK and Isle of Man vessels)¹¹.

1.4.5.3 The top 15 species (by landed weight) caught by UK and Isle of Man vessels from the commercial fisheries study area are presented in Figure 1.12 (2012 to 2022). Queen scallop, king scallop, Nephrops, whelk and herring were the top five species in terms of both landed weight and landed value. The greatest total weight landed over the time period was from queen scallop, whereas the greatest total value was from king scallop.

1.4.5.4 An overview of the top five species is presented in Table 1.5.

¹⁰ MMO, 2023a

¹¹ MMO, 2023a

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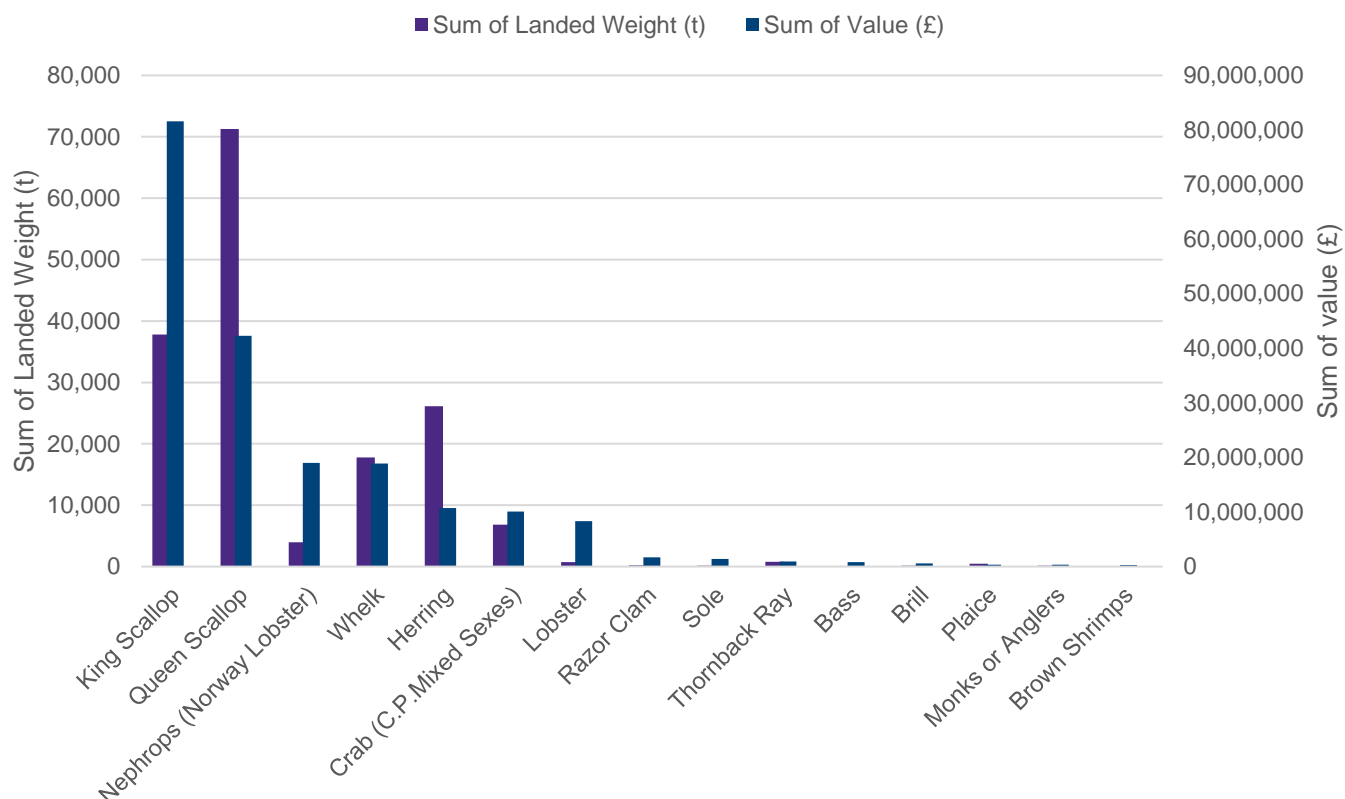


Figure 1.12: Sum of landed weight and value within the commercial fisheries study area for the top 15 species (2012 to 2022) (UK and Isle of Man vessels)¹².

Table 1.5: Overview of key species targeted within the commercial fisheries study area.

Species	Latin name	Gear type	Vessel size	Seasonality
King scallop	<i>Pecten maximus</i>	Scallop dredge	>10 m	King scallop landings are generally highest during November. Fishery closed between 01 June and 31 October.
Queen scallop	<i>Aequipecten opercularis</i>	Scallop dredge or otter trawl	>10 m	Queen scallop landings are generally highest between July and September. Fishery closed between 01 April and 30 June.
Whelk	<i>Buccinum undatum</i>	Pot/trap	>10 m and ≤10 m	Whelk landings are higher in the summer but caught all year around.
Herring	<i>Clupea harengus</i>	Pelagic trawls or purse seine nets	>10 m	Herring landings are highest during August to October. Douglas Bank closure 21 September to 15 November.
Norway lobster	<i>Nephrops norvegicus</i>	Pot/trap or bottom trawls	>10 m and ≤10 m	Norway lobster landings are higher in the summer but caught all year around.

¹² MMO, 2023a

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King scallop

- 1.4.5.5 King scallop are most commonly found in areas of optimum bivalve feeding conditions, where fine gravel and sand exposed to water currents are present. King scallop achieve reproductive maturity between three to five years, live to 10 to 15 years and are most abundant in depths of 20 to 70 m (Cappell et al., 2018; Howarth and Stewart, 2014; Salomonsen et al. 2015). Recruitment is generally perceived as unpredictable, due to the recruitment's dependency on larval production and spawning, as well as the transportation of larvae to areas optimum for development (Delargy et al., 2019). King scallop fisheries in the UK and Isle of Man are strictly regulated through the utilisation of gear restrictions, minimum legal landing sizes, effort controls and seasonal closures, as described in section 1.4.2.
- 1.4.5.6 Over the period 2012 to 2022, king scallop landings by weight within the commercial fisheries study area, were greatest from November to May (Figure 1.13), with a landed weight range across these months from 3,528 to 9,168 t. Landed weight of king scallop showed relatively similar seasonal trends across the 2012 to 2022 period. Limited dredging occurred during June to October for all years, due to the king scallop seasonal closure during these months (June to October, Table 1.5).

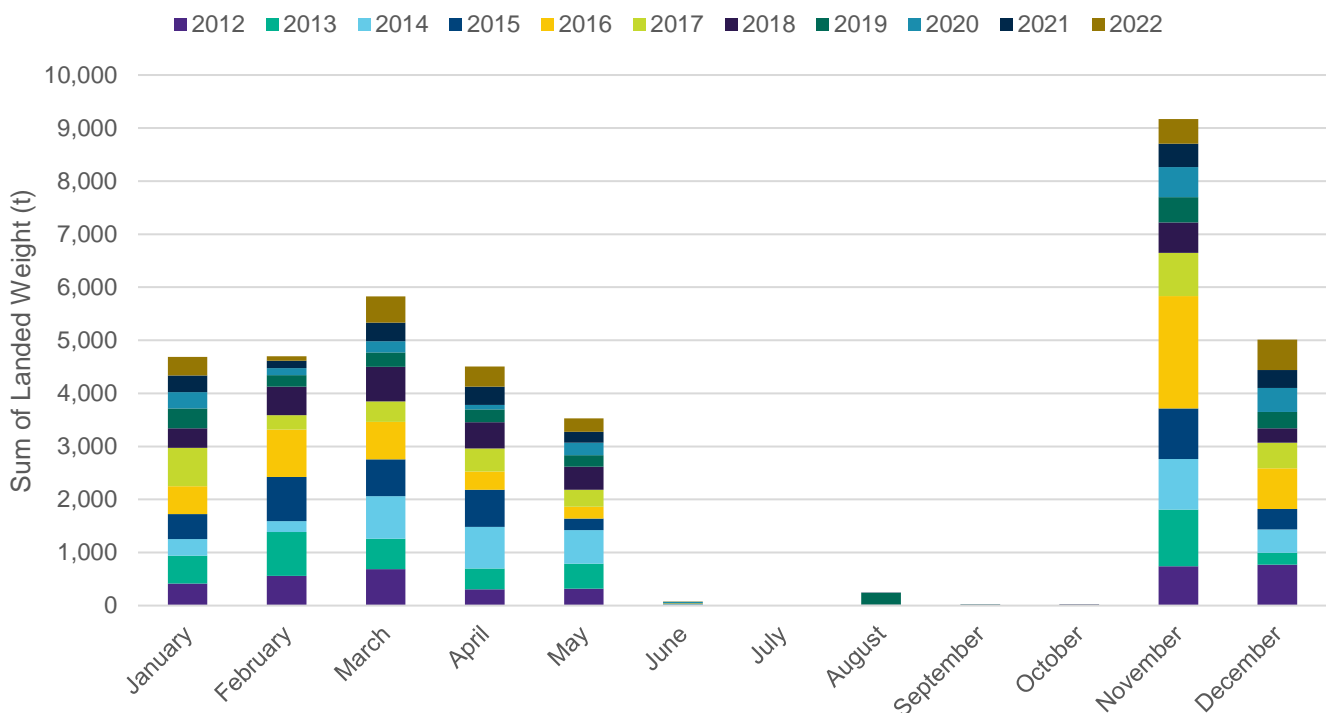


Figure 1.13: Seasonality of landed weight (t) of King scallop within the commercial fisheries study area (2012 to 2022) (UK and Isle of Man vessels)¹³.

Queen scallop

- 1.4.5.7 Queen scallop are fished commercially throughout UK and Isle of Man waters, with particularly commercially important grounds located around the Isle of Man. Queen

¹³ MMO, 2020a

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

scallop can be found in high densities within gravel or sand substrates, at depths of up to 100 m.

- 1.4.5.8 Key differences can be noted between queen and king scallop, where queen scallop possess two distinctive curved shells, the king scallop's upper shell is almost flat, and queen scallop are typically smaller in size. Landings of queen scallop tend to be less valuable and more variable than king scallop.
- 1.4.5.9 The most important months for landings of queen scallop during the period 2012 to 2022 were July, August and September, with a landed weight range across these months from 10,089 to 12,069 t (Figure 1.14). Landed weight of queen scallop across the 2012 to 2022 period showed relatively similar seasonal trends to that of king scallop. However, landed weights from 2018 to 2022 were notably lower.
- 1.4.5.10 The minimum landed weight of queen scallop occurred during May 2016 to 2022, where no landings were recorded, and maximum during July 2013 at 2,642 t. A notable lack of landings can be observed between April to June in recent years, attributed to the 2018 introduction of seasonal closures for queen scallop in the Irish Sea.

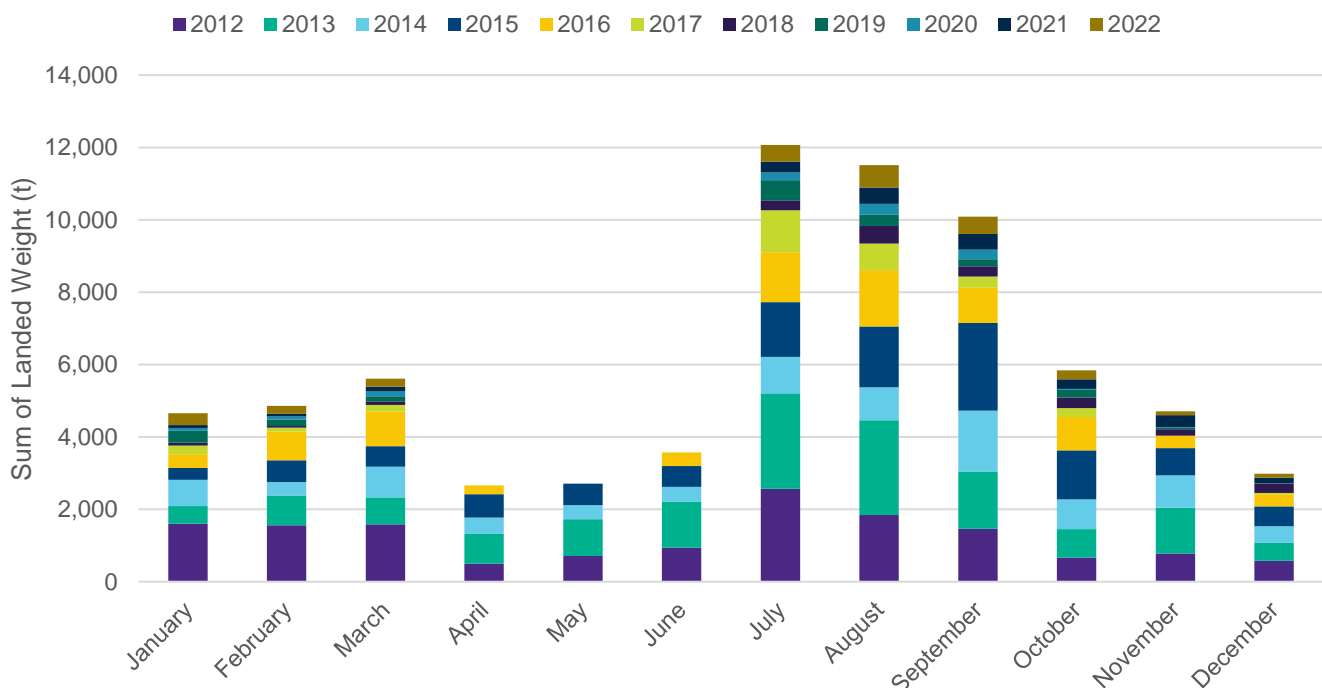


Figure 1.14: Seasonality of landed weight (t) of Queen scallop within the commercial fisheries study area (2012 to 2022) (UK and Isle of Man vessels)¹⁴.

Whelk

- 1.4.5.11 The whelk is most abundant at water depths between 0 m to 50 m and in habitats of mixed sediments. Depending on their environmental conditions and geographical location, whelk tend to achieve reproductive maturity at two to three years, grow to 150 mm and live for up to 15 years. A whelk's life cycle does not consist of a pelagic

¹⁴ MMO, 2020a

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

phase, instead internally fertilised eggs are laid upon hard substrates, where juveniles emerge after three to five months.

- 1.4.5.12 Whelk landings, in terms of weight, over the period 2012 to 2022, were most prominent during April to August inclusive, with a landed weight range across these months of 1,761 to 2,326 t (Figure 1.15). Landed weight of whelk was notably higher during May 2018 (312 t). The minimum landed weight of whelk occurred in December 2012 (19 t) and January 2013 (18 t).

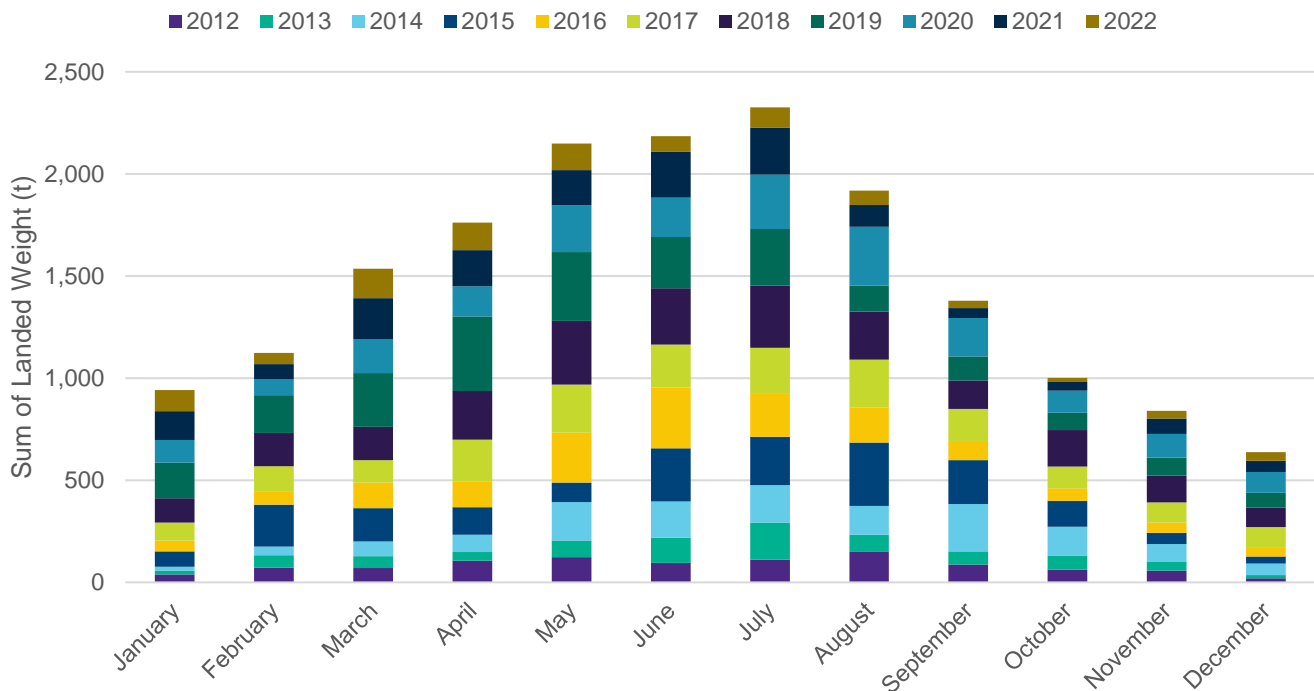


Figure 1.15: Seasonality of landed weight (t) of whelk within the commercial fisheries study area (2012 to 2022) (UK and Isle of Man vessels)¹⁵.

***Nephrops* (Norway lobster)**

- 1.4.5.13 Nephrops are decapod crustaceans that can typically be found in soft sediments within shallow burrows. Unlike the edible crab, Norway lobster do not undertake large migrations and have displayed territorial behaviour.
- 1.4.5.14 Nephrops landings, in terms of weight over the period 2012 to 2022, were most prominent during April, May and July, although this species is landed all year round (Figure 1.16). The minimum of 0t occurred in December 2014.

¹⁵ MMO, 2020a

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

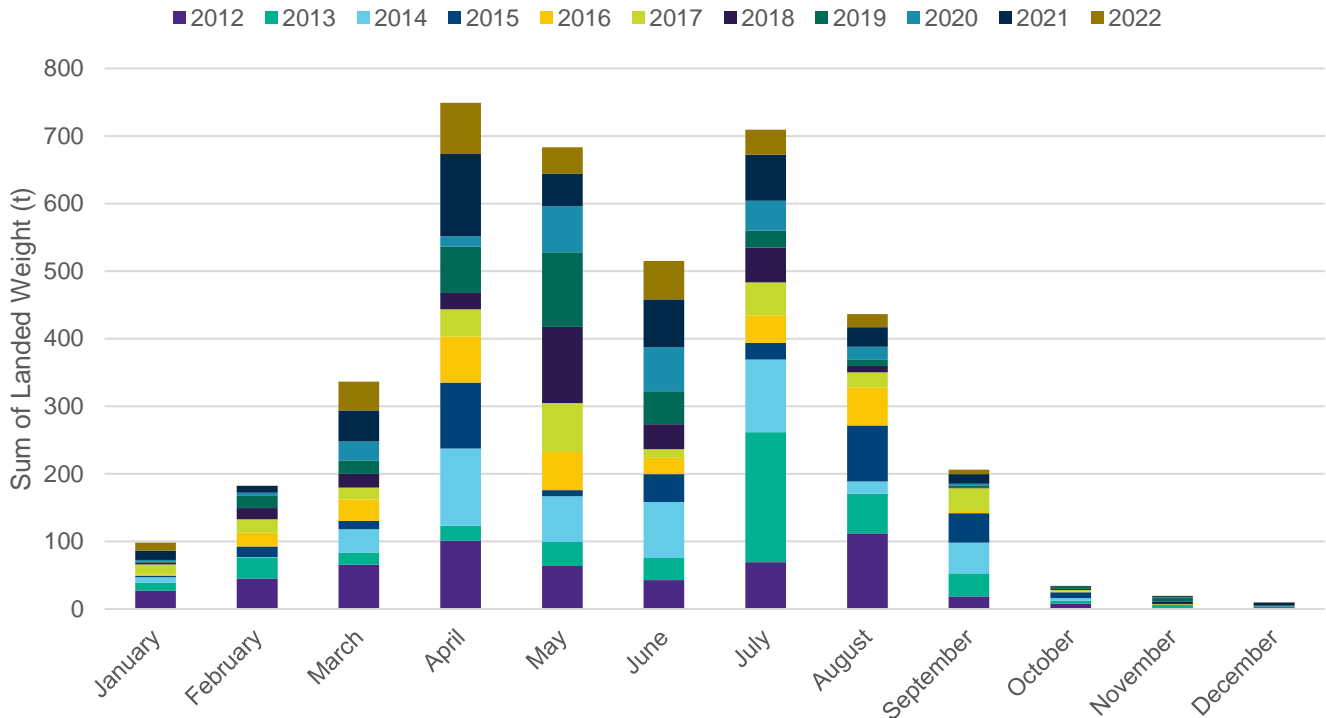


Figure 1.16: Seasonality of landed weight (t) of lobster within the commercial fisheries study area (2012 to 2022) (UK and Isle of Man vessels)¹⁶.

Herring

- 1.4.5.15 Herring are a planktivorous foraging fish, which spawn in coastal areas within specific benthic habitats consisting of gravel and small stones. Spawning occurs throughout September to November, and there are established spawning grounds north and east of the Isle of Man, and on the west Irish coast (Dickey-Collas *et al.*, 2001). A proportion of the stock in the Irish Sea migrates northwards during the summer months.
- 1.4.5.16 Landings of herring in the commercial fisheries study area over the period 2012 to 2022 were predominantly during August and September (Figure 1.17). A total of 6,432 t was caught during August and 23,050 t was caught during September across 2012 to 2022. Annual landings of herring fluctuate, depending on ICES advice on the stock (paragraph 1.4.2.23).

¹⁶ MMO, 2020a

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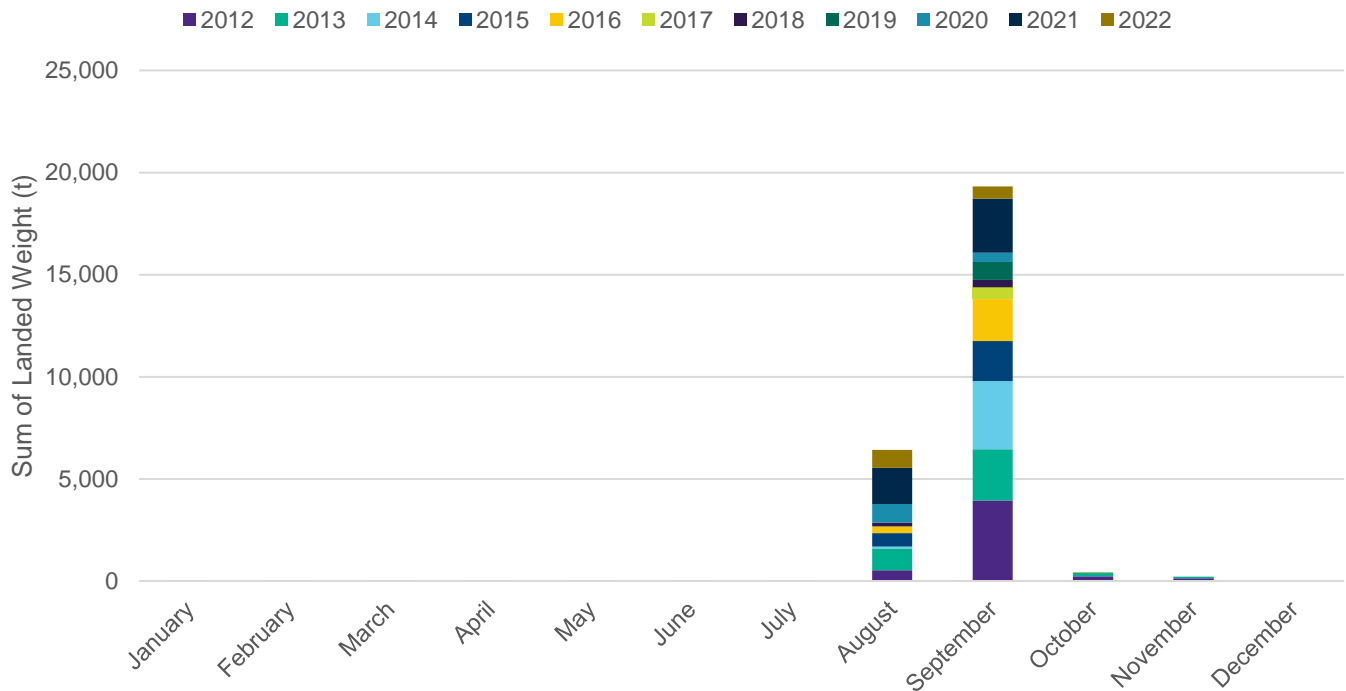


Figure 1.17: Seasonality of landed weight (t) of herring within the commercial fisheries study area (2012 to 2022) (UK and Isle of Man vessels)¹⁷.

Species landed by non-UK vessels

- 1.4.5.17 A total of 53 species were landed by Belgian vessels over the period 2006 to 2016 from the commercial fisheries study area. The top 20 species (Figure 1.18) constituted approximately 99% of the total Belgian catch landed during the study period (2006 to 2016). The top five species (common sole, European plaice, thornback ray, rays and skates and brill) constituted approximately 85% of the total Belgian tonnage landed from the region. Data from Belgian vessels shows that the fleet's main targets were demersal species from ICES Rectangle 36E6, and similar species were caught in all other associated rectangles (36E5, 37E5 and 37E6).
- 1.4.5.18 There was a large variety of species caught by the Belgian fleet and, given the understanding that the Belgian fleet almost exclusively uses beam trawls (section 1.4.6), this suggests that other species may have been caught as bycatch during fishing for the main target species.

¹⁷ MMO, 2020a

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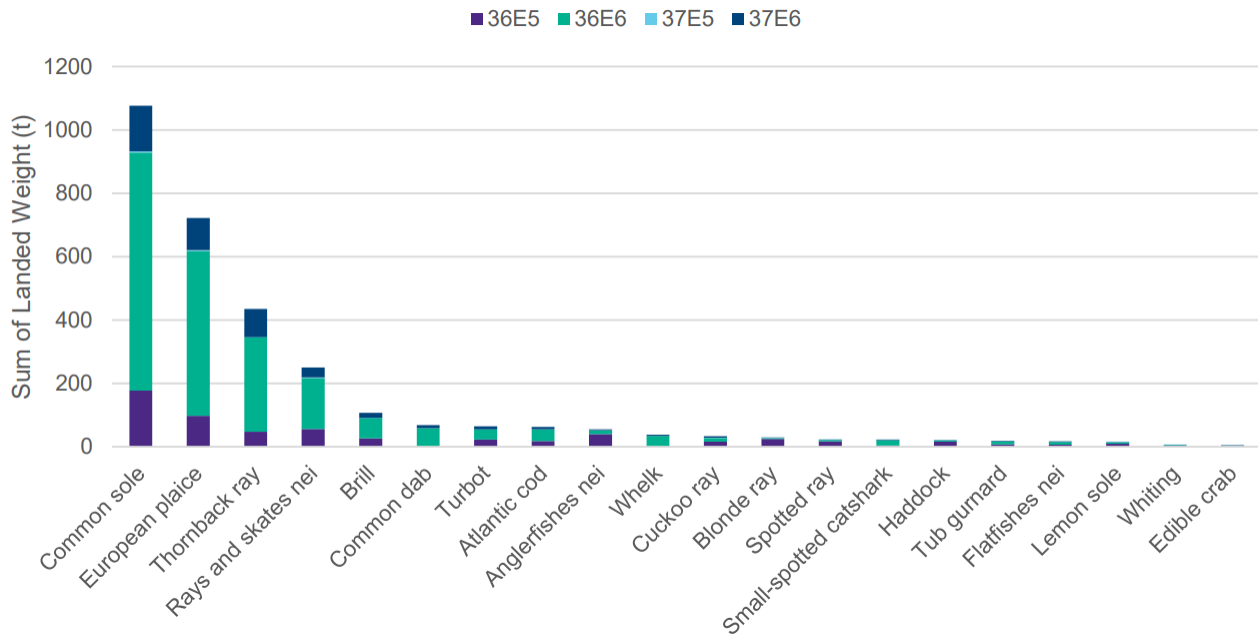


Figure 1.18: Total landings (t) from Belgian vessels within the commercial fisheries study area displayed for the top 20 species (2006 to 2016)¹⁸.

1.4.5.19 A total of 35 species were landed by Irish vessels over the period 2006 to 2016 within the commercial fisheries study area. The top 20 species in terms of landed weight are displayed in Figure 1.19. The top species (king scallop) constituted approximately 68% of the total Irish catch landed during the monitoring period, with landings predominantly within ICES Rectangle 36E5. King scallop landings are significantly higher than other species landed by Irish vessels, indicating the significant importance of this species to Irish vessels active in the region.

¹⁸ EU STECF, 2017

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

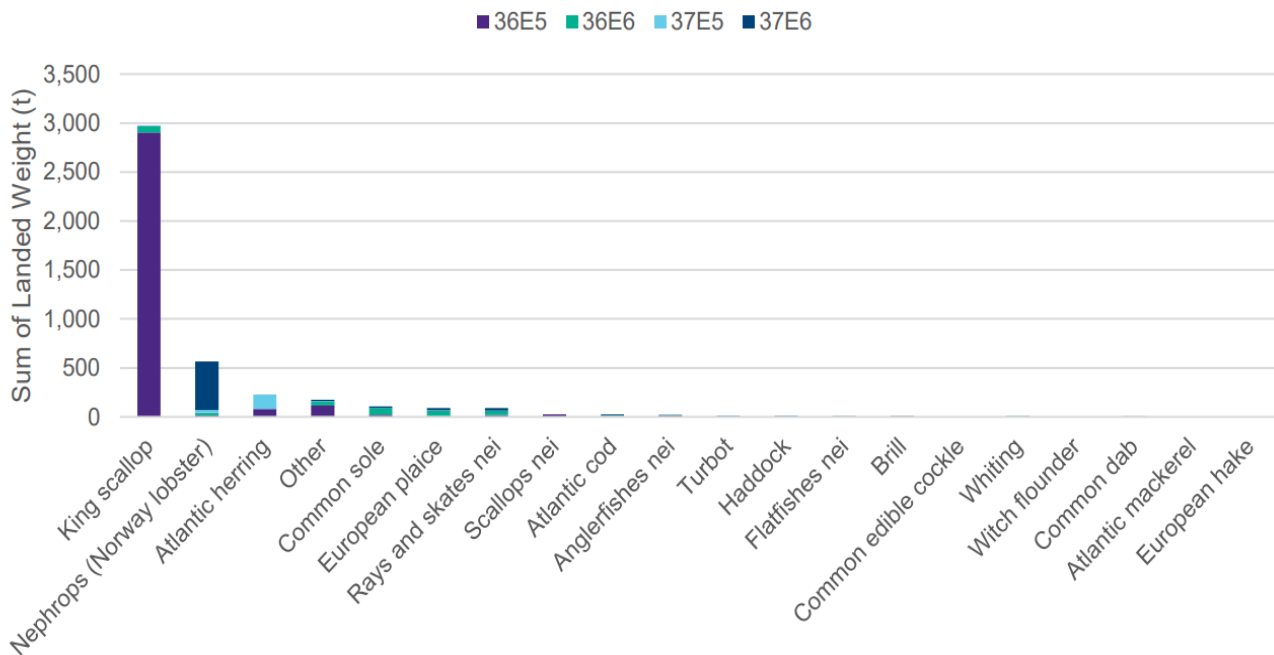


Figure 1.19: Total landings (t) from Irish vessels within the commercial fisheries study area displayed for the top 20 species (2006 to 2016)¹⁹.

1.4.5.20 Only one species (edible crab) was landed by French vessels during 2006-2016 within the commercial fisheries study area (Figure 1.20), and only from within Rectangle 36E6.

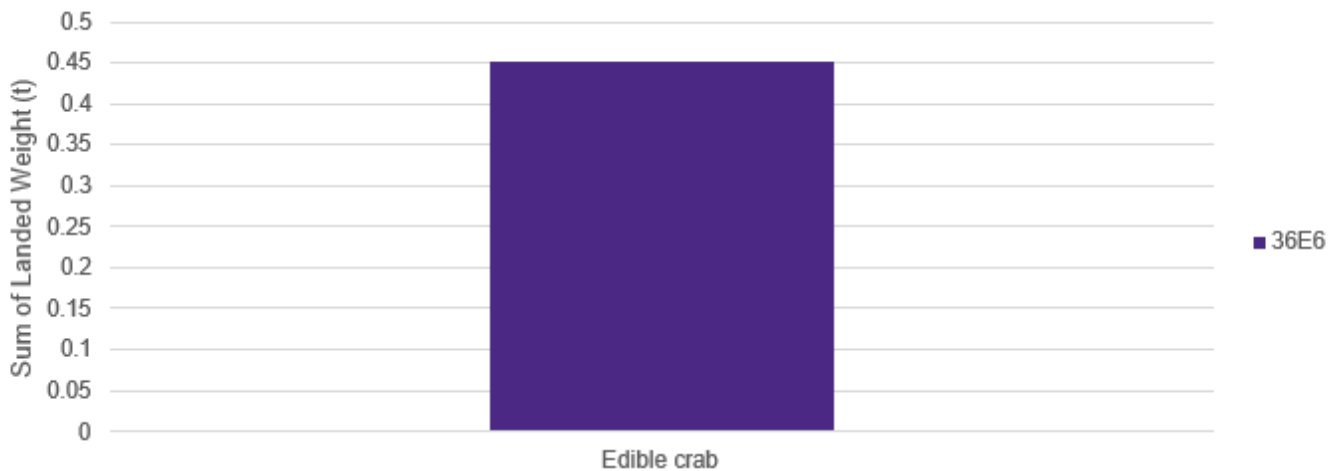


Figure 1.20: Total landings (t) from French vessels within the commercial fisheries study area displayed by species (2006 to 2016)²⁰.

1.4.5.21 A total of four species were landed by Dutch vessels over the period 2006 to 2016 (Figure 1.21) within the commercial fisheries study area.

¹⁹ EU STECF, 2017

²⁰ EU STECF, 2017a

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

1.4.5.22 There were no landings by Dutch vessels within ICES Rectangle 37E5. The top two species, king scallop and European sprat, constituted approximately 58% and 37%, respectively, of the total Dutch catch landed during the monitoring period. The remainder of the total Dutch tonnage landed from the region was constituted of jack and horse mackerel (2.5%) and common sole (2.5%). Data from Dutch vessels shows that the fleet targets the majority of landings from ICES Rectangle 36E5.

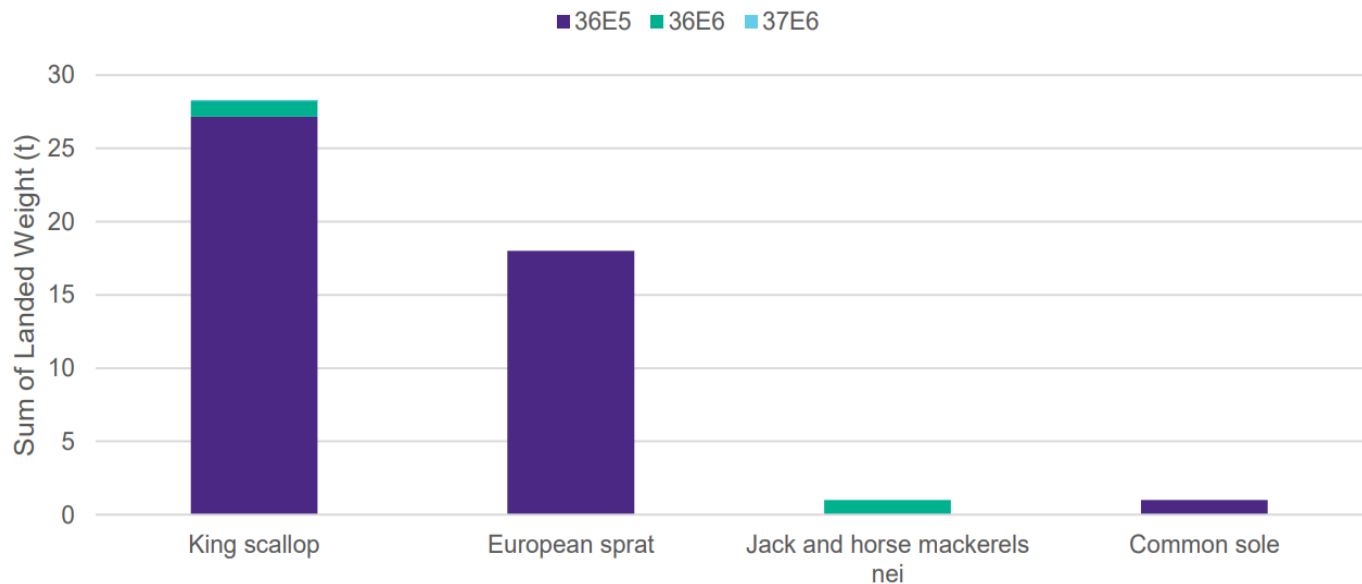


Figure 1.21: Total landings (t) from Dutch vessels within the commercial fisheries study area, displayed by species (2006 to 2016)²¹.

1.4.5.23 The EU STECF species data were analysed further, allowing a closer look at the temporal variation of the top 15 most commercially important species for non-UK vessels. Overall, king scallop, common sole, European plaice, Nephrops and thornback ray were the dominant species caught by all non-UK vessels in terms of landed weight across all years and ICES rectangles (Figure 1.22). King scallop appeared to be of particular importance in terms of landed weight during 2010 to 2016, and less so during prior years, which aligns with feedback from project-specific consultation indicating that the fishery is cyclical.

²¹ EU STECF, 2017

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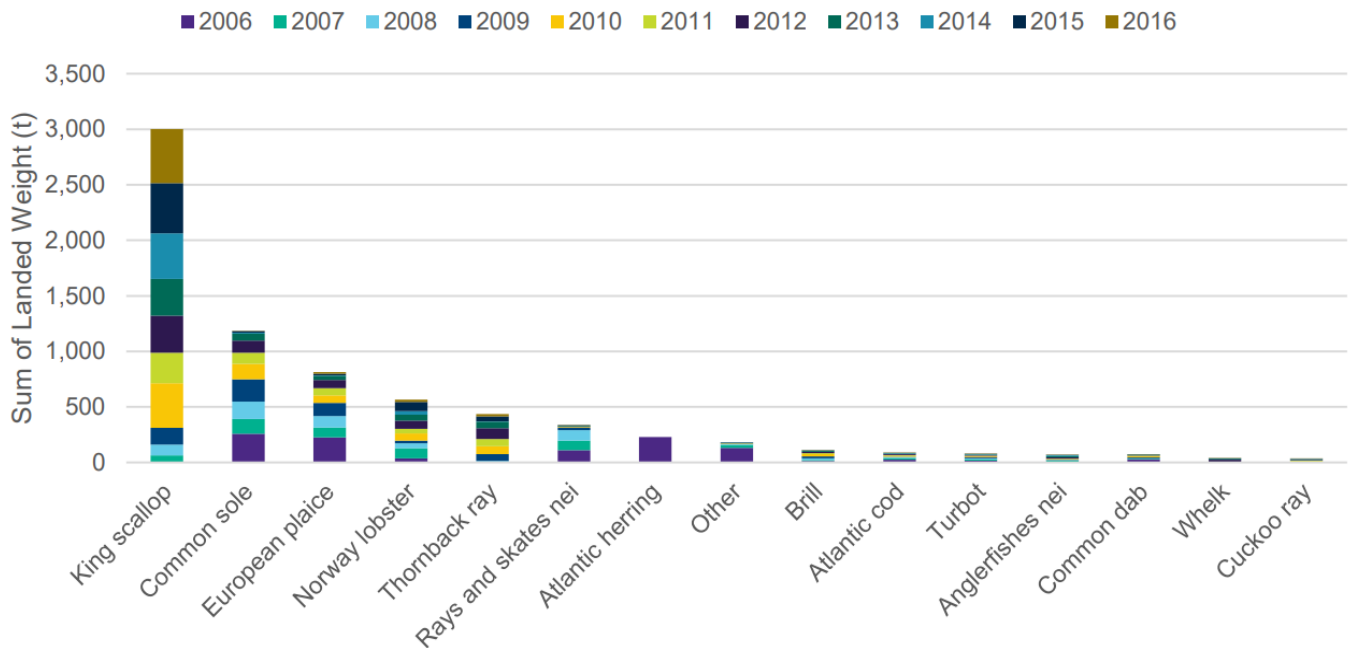


Figure 1.22: Annual trends in the top 15 species by total landings weight (2006 to 2016) within the commercial fisheries study area (non-UK vessels)²².

1.4.5.24 Figure 1.23 shows the seasonality for the top 15 species by landed weight from the non-UK vessels across the region. The landings data illustrate that over the period 2006 to 2016, January to March and October to December were the most productive periods of the year in terms of landings for king scallop; July-September was the least productive period, which is when the fishery is closed to protect spawning. Common sole was caught predominantly during the first half of the year, as also indicated by fisheries stakeholders. Highest landings of European plaice were caught during January to March. April to September was the most productive time of the year for Nephrops. Notably, Atlantic herring was only caught between July to September.

²² EU STECF, 2017

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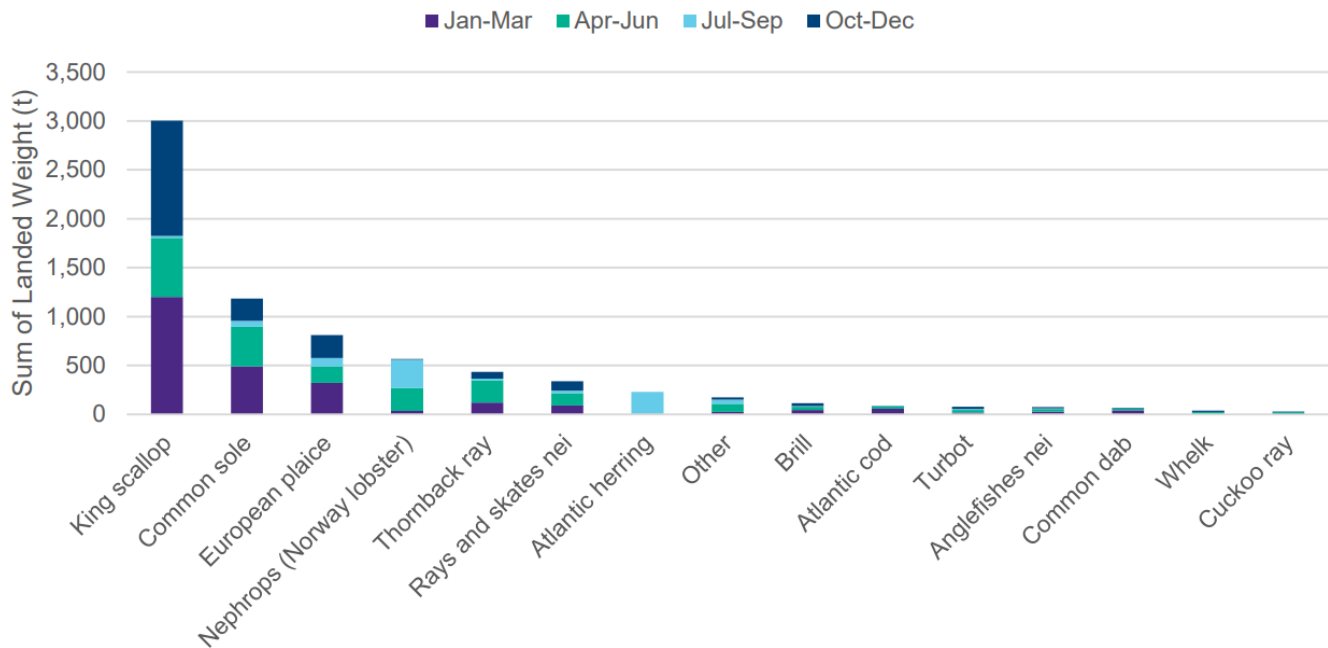


Figure 1.23: Seasonal trends in the top 15 species by total landings weight (2006 to 2016) within the commercial fisheries study area (non-UK vessels)²³.

1.4.6 Gear types

- 1.4.6.1 The data interrogated in this study provides information on the types of fishing gear used by the UK, Isle of Man and non-UK fleets in the commercial fisheries study area. Data has been collated for the most recently available 10-year time period: 2012 to 2022 for the MMO data (UK and Isle of Man vessels), and 2006 to 2016 for the EU STECF data (non-UK vessels).
- 1.4.6.2 The data shows that 12 identifiable gear types were recorded as being used to target fish stocks by UK and Isle of Man vessels, specifically: demersal trawl/seine, pots and traps, otter trawl, pelagic trawl, demersal trawl, beam trawl, drift and fixed nets, gears using hooks, handlines, other mobile gears and other passive gears (MMO, 2023a).
- 1.4.6.3 A total of eight gear types was recorded for non-UK vessels: beam trawls; demersal seines, dredges, gill nets, longlines, otter trawls, pelagic trawls and pots (EU STECF, 2017).
- 1.4.6.4 Dredges accounted for approximately 54% of total landings by UK and Isle of Man vessels from the commercial fisheries study area (Figure 1.24). This indicates the importance of the scallop fishery (see section 1.4.5). Demersal trawl/seine (targeting demersal dwelling species) were also of notable importance in the commercial fisheries study area and consisted mostly of vessels >10 m in length.
- 1.4.6.5 For the non-UK vessels, beam trawls and dredges accounted for a large proportion of total landings from the commercial fisheries study area Figure 1.25. Similarities in gear types can be observed with the UK and Isle of Man vessels, which predominantly used dredges. The spatial distribution of vessels using the different gear types within the respective ICES Rectangles is discussed in section 1.4.8.

²³ EU STECF, 2017

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

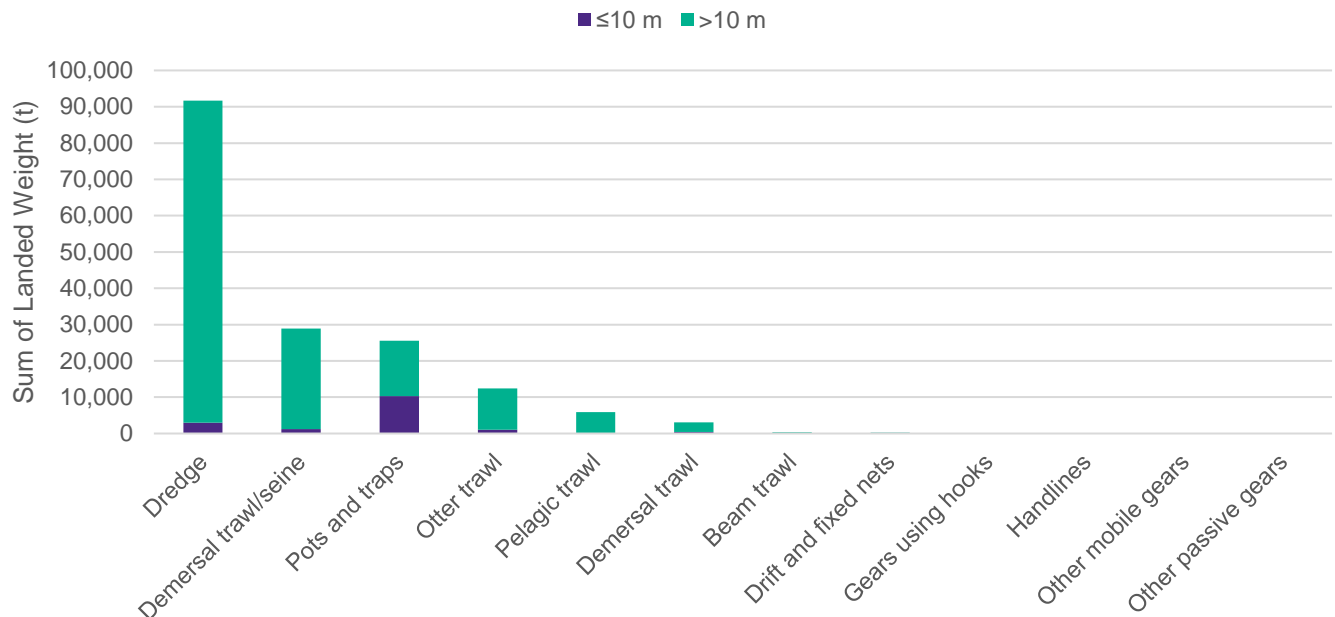


Figure 1.24: Total landings weight by gear type within the commercial fisheries study area (2012 to 2022) (UK and Isle of Man vessels)²⁴.

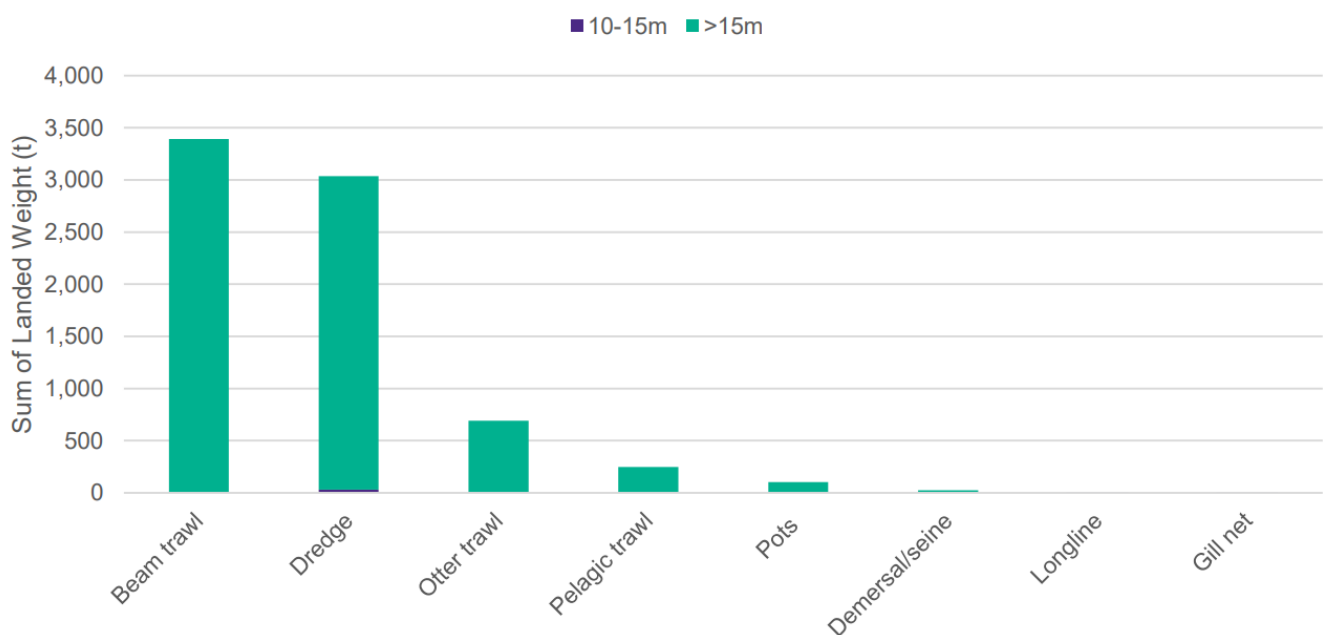


Figure 1.25: Total landings weight by gear type (2006 to 2016) within the commercial fisheries study area (non-UK vessels)²⁵.

1.4.6.6 The data indicates that English vessels utilised a variety of gear types across the commercial fisheries study area (Figure 1.26). Of the gear types, the use of pots, traps and dredges was most dominant. The data also indicates that ICES rectangle 36E6 was of significant importance to English fleets utilising pots and traps; this likely reflects

²⁴ MMO, 2023a

²⁵ EU STECF, 2017

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

the whelk fishery, particularly vessels operating out of Fleetwood, which is discussed in sections 1.4.1, 1.4.5 and 1.4.7.

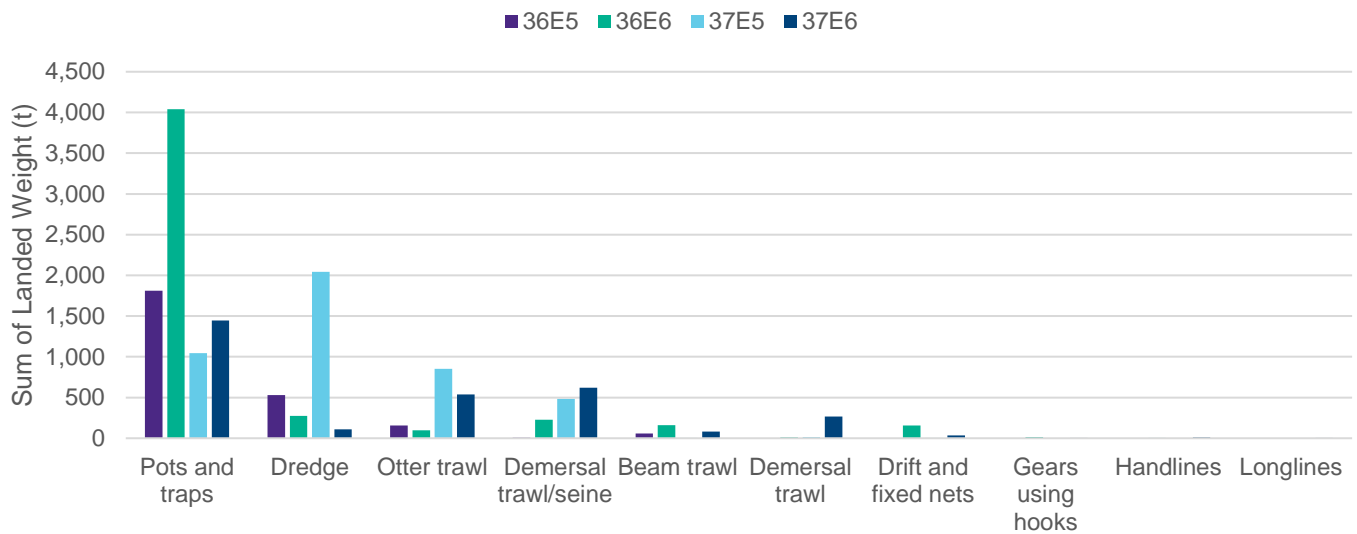


Figure 1.26: Total landings weight from English vessels by gear type within the commercial fisheries study area (2012 to 2022)²⁶.

1.4.6.7 As expected, Figure 1.27 illustrates that fleets from the Isle of Man were mostly active within ICES Rectangle 37E5 which overlaps with Manx waters. Dredges (targeting king and queen scallop) and pots and traps (targeting crab, lobster and whelk) accounted for the majority of landings. Other notable gear types used by the Manx fleet within the commercial fisheries study area were demersal trawl/seine and otter trawl.

²⁶ MMO, 2023a

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

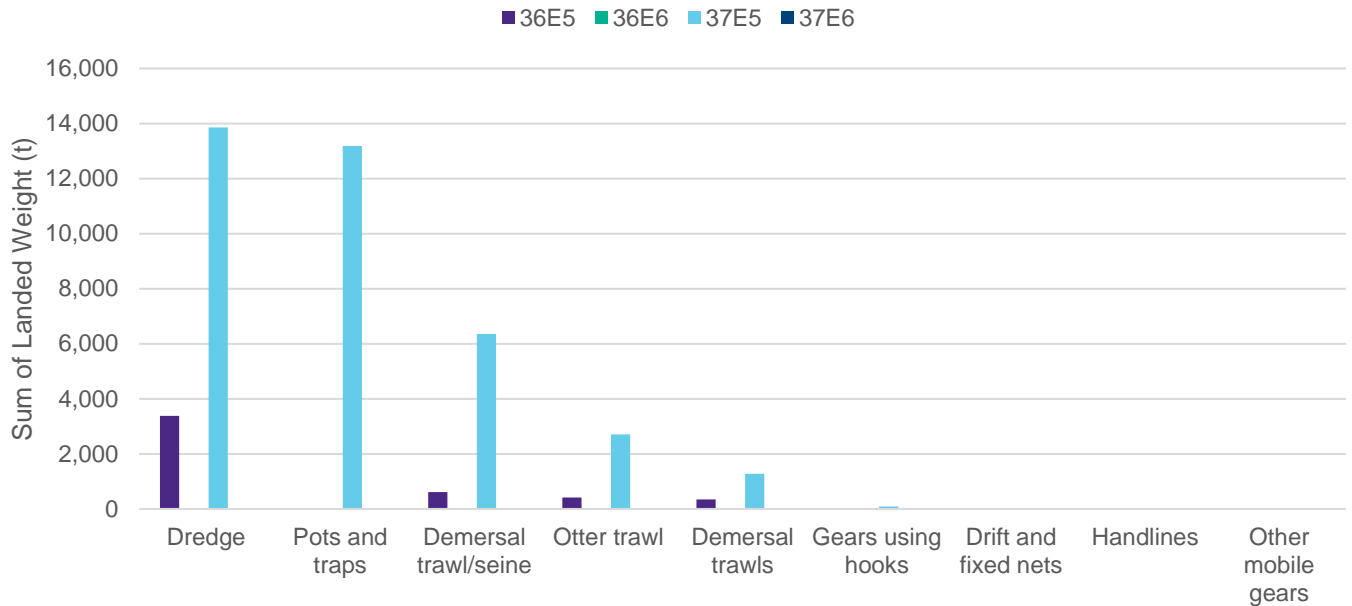


Figure 1.27: Total landings weight from Isle of Man vessels by gear type within the commercial fisheries study area (2012 to 2022)²⁷.

1.4.6.8

A Jersey based vessel showed significantly less variety of deployed gear types than English and Isle of Man vessels (Figure 1.28). Data shows that the Jersey vessel caught a relatively low landed weight (t), in comparison to other UK and Isle of Man vessels and only utilised pots and traps within the commercial fisheries study area.

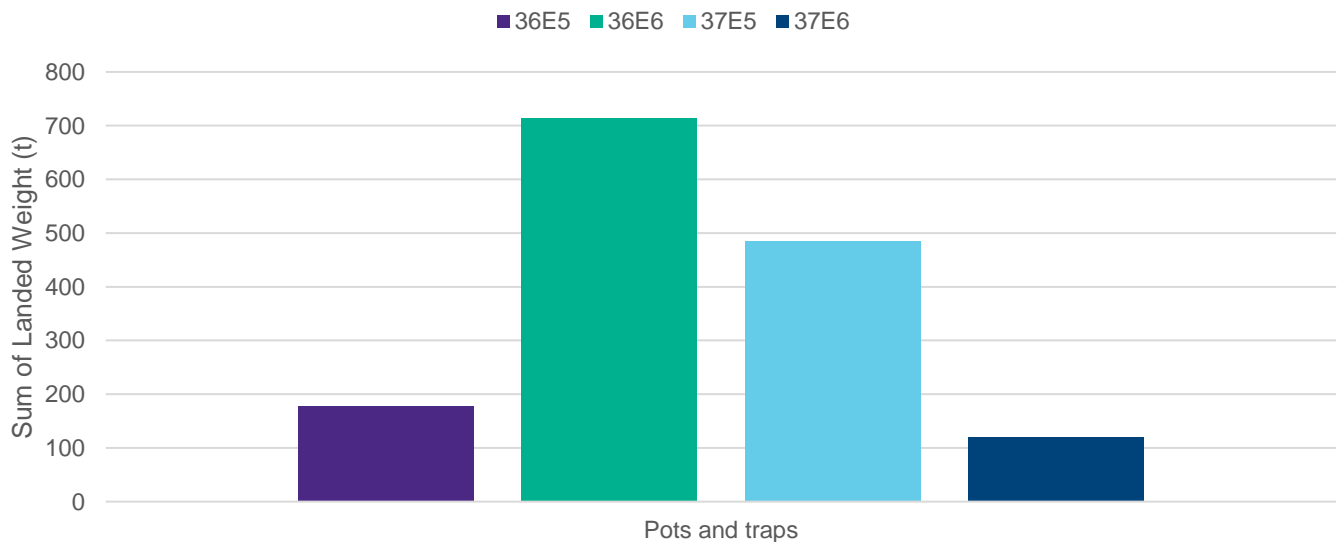


Figure 1.28: Total landings weight from a Jersey vessel by gear type within the commercial fisheries study area (2012 to 2022)²⁸.

²⁷ MMO, 2023a

²⁸ MMO, 2023a

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

1.4.6.9 Similar to vessels from the Isle of Man, Northern Irish vessels were mostly active within ICES Rectangle 37E5. Of the gear types, demersal trawl/seine, dredge and otter trawl were most dominant (Figure 1.29).

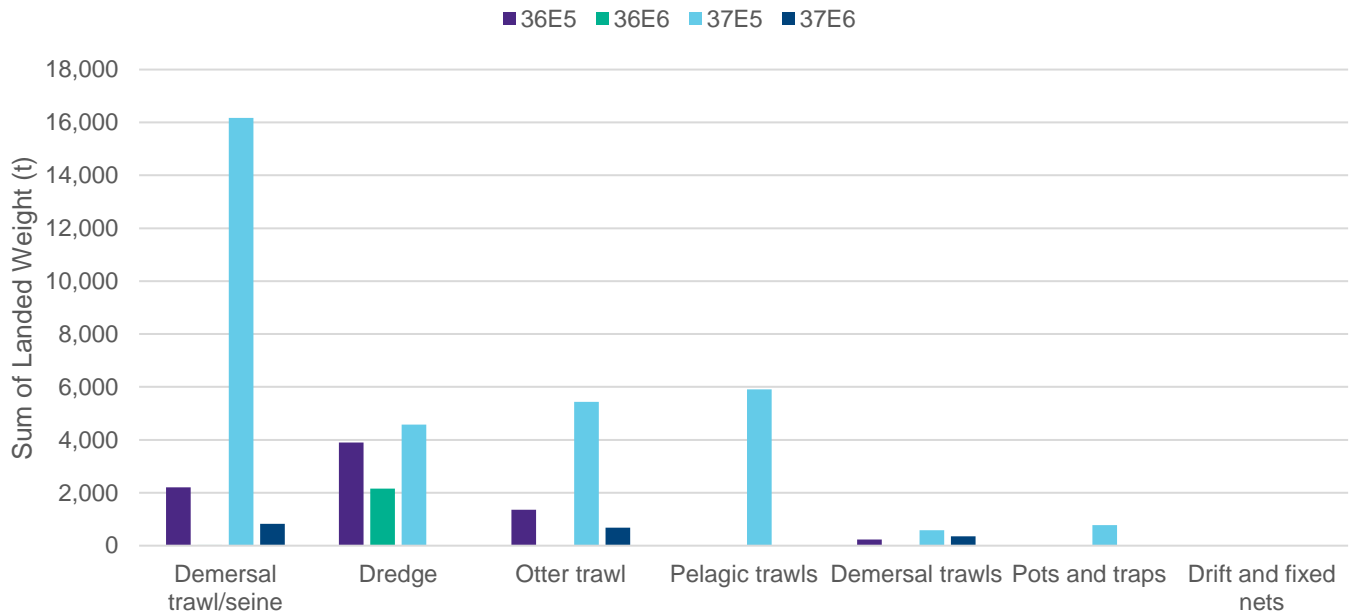


Figure 1.29: Total landings weight from Northern Irish vessels by gear type within the commercial fisheries study area (2012 to 2022)²⁹.

1.4.6.10 Dredge vessels accounted for the majority of landings for the Scottish fleet active within the commercial fisheries study area (Figure 1.30). Scottish vessels landed a significantly greater weight than vessels from other parts of the UK, particularly within Rectangles 36E5, highlighting the commercial importance of the region for Scottish vessels targeting king and queen scallops.

²⁹ MMO, 2023a

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

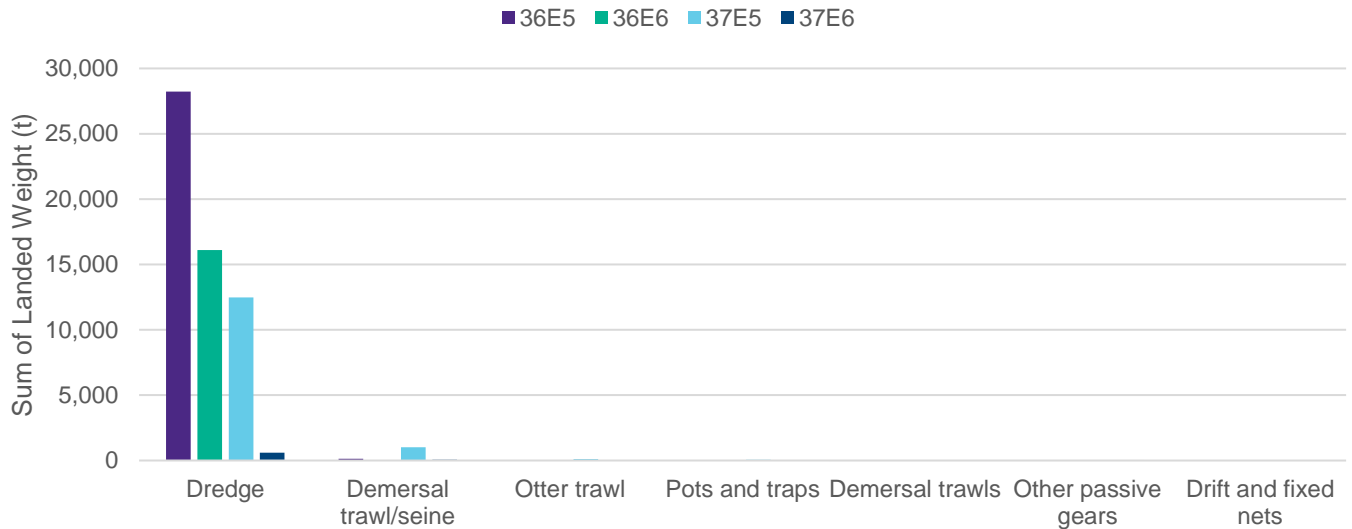


Figure 1.30: Total landings weight from Scottish vessels by gear type within the commercial fisheries study area (2012 to 2022)³⁰.

1.4.6.11 Pots and traps and dredges were the dominant gear type used by the Welsh fleet across ICES Rectangles, notably within Rectangle 36E5, where Anglesey is located (Figure 1.31).

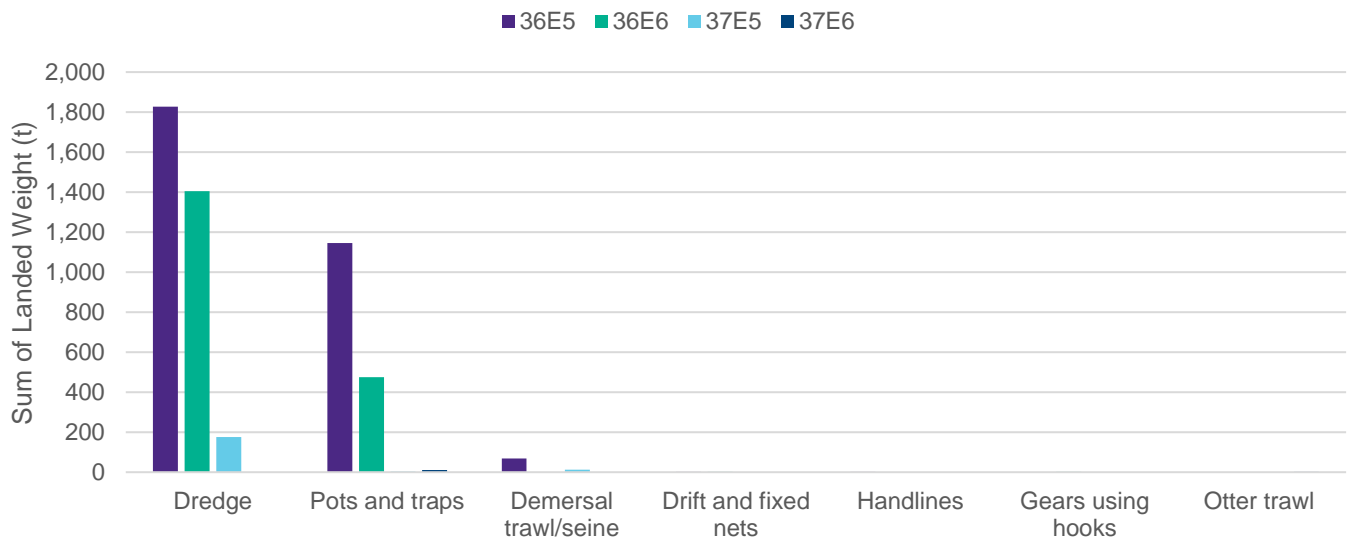


Figure 1.31: Total landings weight from Welsh vessels by gear type within the commercial fisheries study area (2012 to 2022)³¹.

³⁰ MMO, 2023a

³¹ MMO, 2023a

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

- 1.4.6.12 The data indicates that Belgian vessels almost exclusively utilised beam trawls across the commercial fisheries study area (Figure 1.32), suggesting that the Belgian fleet is targeting demersal species. Beam trawls are known to catch a wide variety of bottom dwelling fish which would result in a varied catch containing flatfish, gadoids, and cartilaginous species, aligning with findings of Belgian landing weights by species in section 1.4.5.

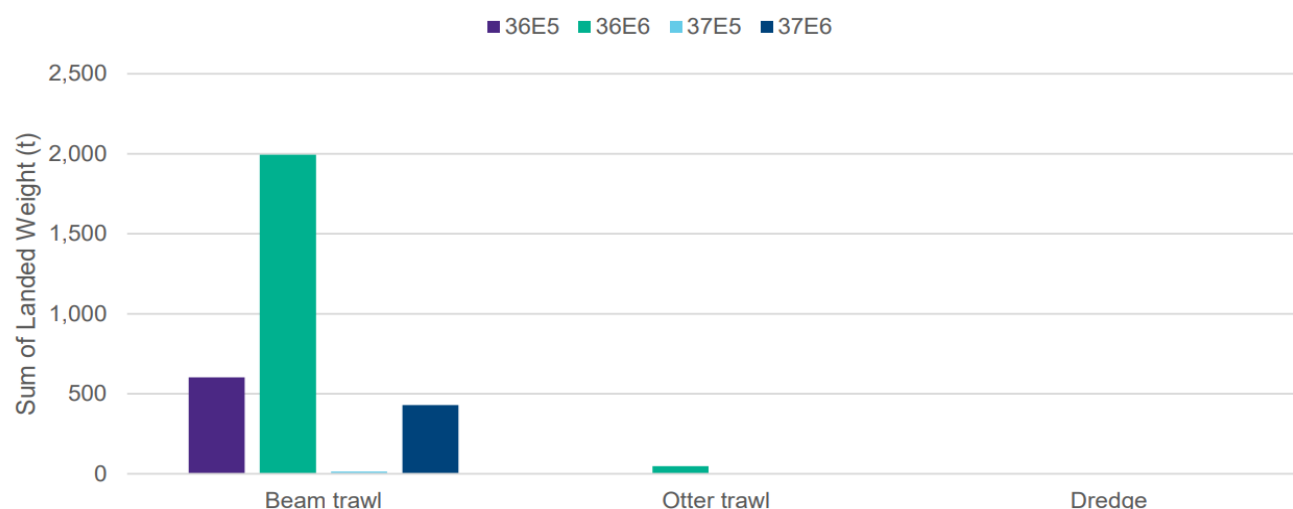


Figure 1.32: Total landings weight from Belgian vessels by gear type (2006 to 2016) within the commercial fisheries study area³².

- 1.4.6.13 French vessels caught a very low weight (t) of fish in comparison to other non-UK vessels. Data shows that French vessels only utilise pots within the commercial fisheries study area and are only active in ICES Rectangle 36E6 (Figure 1.33).

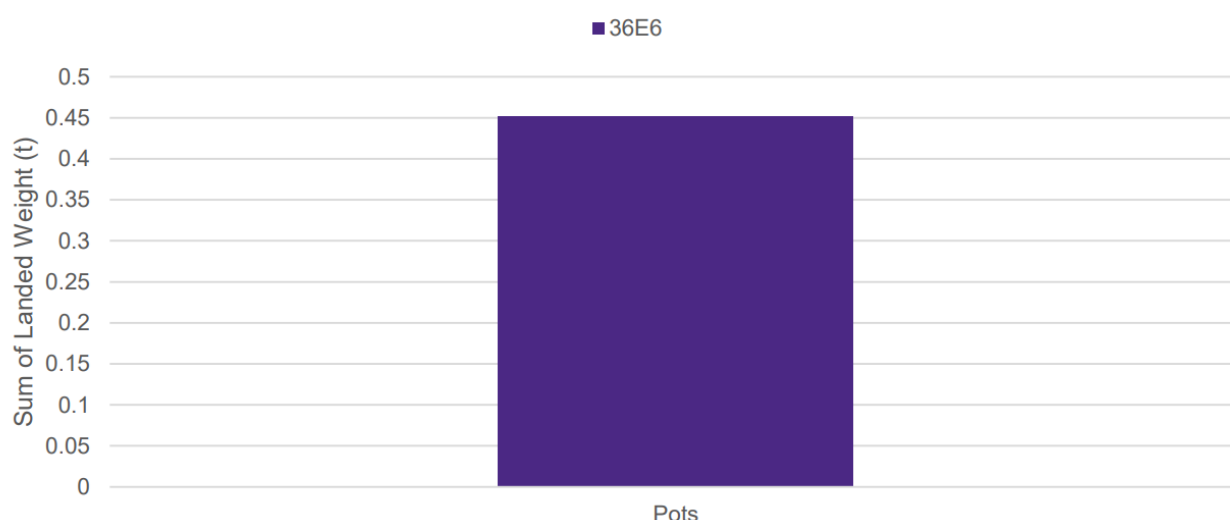


Figure 1.33: Total landings weight from French vessels by gear type (2006 to 2016) within the commercial fisheries study area³³.

³² EU STECF, 2017

³³ EU STECF, 2017

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

- 1.4.6.14 The Irish fleet showed a variety of gear types, with the utilisation of dredges (targeting king and queen scallops) in ICES Rectangle 36E5 being the most prominent (Figure 1.34). Otter trawl, beam trawl, demersal seine, pelagic trawl and pots were also used by the Irish fleet within the commercial fisheries study area.

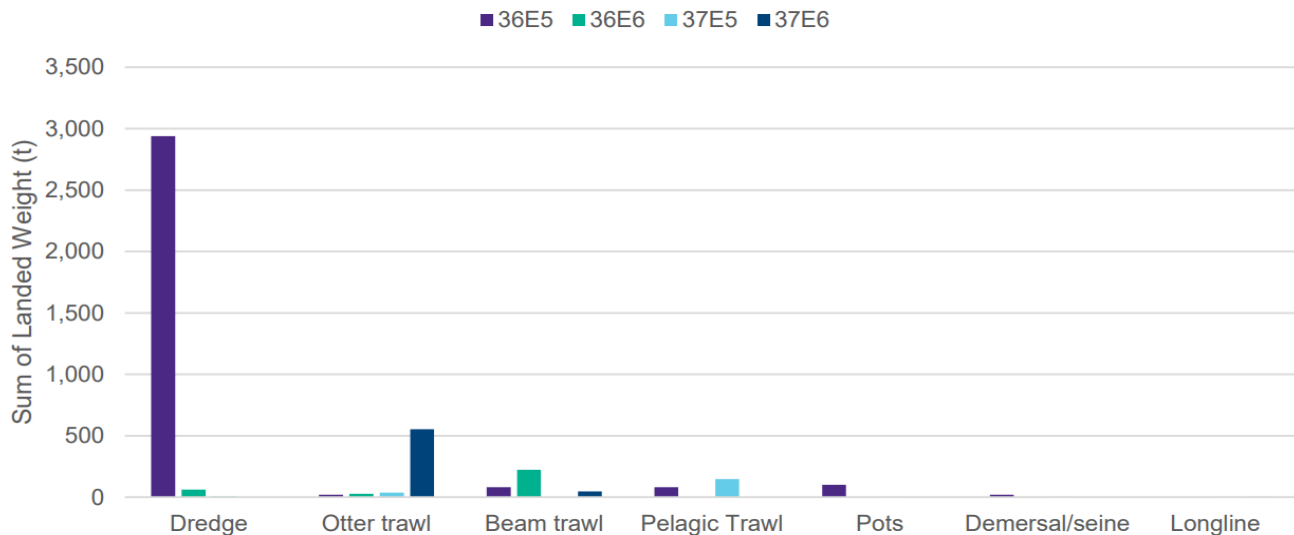


Figure 1.34: Total landings weight from Irish vessels by gear type (2006 to 2016) within the commercial fisheries study area³⁴.

- 1.4.6.15 The total landings caught by Dutch vessels in the commercial fisheries study area were significantly lower in comparison to Belgian and Irish vessels. Dredges and pelagic trawls were the dominant gear type used by the Dutch fleet, notably within ICES Rectangle 36E5 (Figure 1.35). No activity was recorded in ICES Rectangle 37E5.

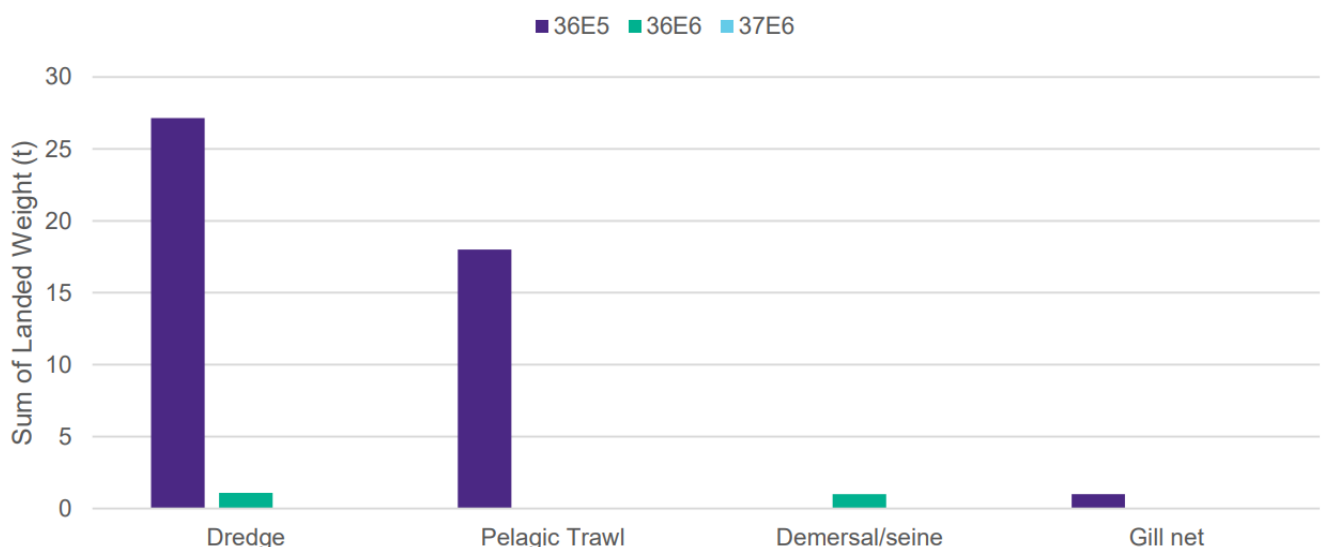


Figure 1.35: Total landings weight from Dutch vessels based on gear type (2006 to 2016) within the commercial fisheries study area³⁵.

³⁴ EU STECF, 2017

³⁵ EU STECF, 2017

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

- 1.4.6.16 It is worth commenting on the general implications of the results of the gear type analysis. The use of dredges and the predominance of landings using fishing vessels >10 m in length, indicates that the seabed supports a range of species that live on or just above the seabed, and the region is important for demersal fish and shellfish. Additionally, use of these gear types suggests that the seabed across the region has areas of seabed whose character is conducive to towing bottom fishing gear (i.e. sediment rather than rock).
- 1.4.6.17 As is evident from the landings data for UK, Isle of Man and non-UK vessels, there is a range of fleets targeting different fisheries across the commercial fisheries study area. The highest proportion of landings by weight from UK and Isle of Man vessels are caught by dredges, and pots and traps. For non-UK vessels, the highest proportion of landings by weight are caught by beam trawls and dredges. Further details on the gear types and vessels used within the key fisheries and fleets that operate across the commercial fisheries study area are described throughout the following sections.

Dredge

- 1.4.6.18 Dredges consists of rigid structures that target numerous species of shellfish through towing along the seabed (Figure 1.36 and Figure 1.37). Within the commercial fisheries study area, queen and king scallop are both caught by vessels deploying dredges, although due to the differences in behaviour between the two species, slightly different gear types may be used for them.
- 1.4.6.19 Scallop dredging is generally undertaken by larger vessels (>10 m in length), due to the engine capacity required to tow such a gear type along the seabed. Scallop are also caught by otter trawl vessels, as discussed in 1.4.6.26.
- 1.4.6.20 Restrictions on dredging activity differ between regional and national authorities and with distance of the activity from the shore. Vessels operating inshore are limited to the number of dredges, whereas vessels operating offshore may use a high number of dredges.
- 1.4.6.21 King scallop are generally fished by vessels operating Newhaven dredges which comprise a triangular frame with a toothed lead bar that penetrates the seabed to scare or flip king scallop up and into a collecting bag behind. A number of these dredges are pulled behind a spreading bar either side of a vessel. Scallop vessels operating within the area have been observed to have between approximately 12 to 36 dredges in total.
- 1.4.6.22 Generally, queen scallop outside of Isle of Man waters are targeted using skid dredges (or otter trawls as discussed in 1.4.6.26), which operate in a similar way as the toothed dredges targeting king scallop. However, with the skid dredges, a tooth bar is replaced with a 'tickler chain' which disturbs queen scallop resting on the seafloor, causing them to swim upwards into the water column where they can be caught by the dredge.
- 1.4.6.23 Tow directions are influenced by a range of factors, including the tide and weather. Within the Morgan Array Area, tows by dredge vessels are generally north to south (established via project-specific consultation). MacNab and Nimmo (2021) found that within the Irish Sea region, dredge vessels typically tow their gear at a speed of two to six knots and have a vessel length of 10 m to 25 m.
- 1.4.6.24 The penetration depth of a typical Newhaven dredge is approximately 3 to 30 cm, but this varies with sediment type (Kaiser et al., 1996; Grieve et al., 2014; Eigaard et al., 2016). MarineSpace, on behalf of the Applicant, engaged with fisheries groups via questionnaires on their gear penetration depth within the commercial fisheries study area. Results found that skid dredges targeting queen scallop have a maximum

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

penetration depth of 0.2 m, whereas dredges targeting king scallop have a maximum penetration depth of 0.3 m (although this is dependent on seabed substrate).

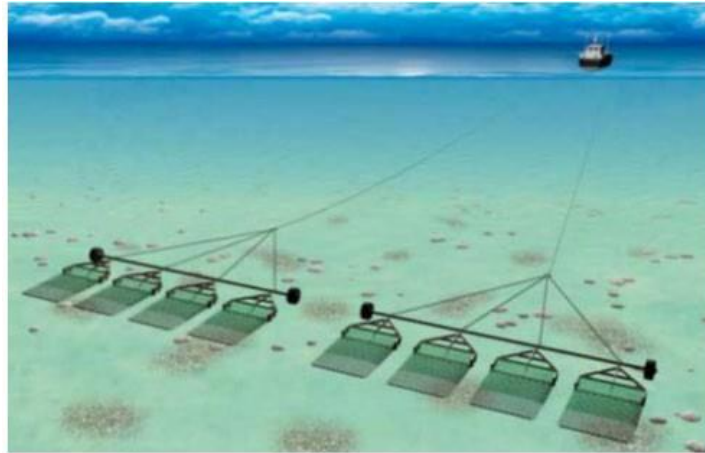


Figure 1.36: Typical dredge gear configuration³⁶.



Figure 1.37: Scallop dredge vessel example³⁷.

Demersal trawls

- 1.4.6.25 Demersal trawls consist of cone-shaped nets that are towed along the seabed to target demersal fish species (Figure 1.38 and Figure 1.39). The mouth of the trawl is spread and held open by a pair of adjacent trawl doors that possess bridles. These bridles are located between the wing-end of the net and the trawl doors, allowing for great areas of seabed to be trawled. These bridles can range from 0 m to 300 m in length, depending upon the seabed substrate and the target species. Demersal fish species are encouraged in-between the trawl doors, into the mouth of the trawl and along a funnel into the end (the 'cod-end') of the net. A range of net mesh sizes can be utilised to target different demersal species.

³⁶ Seafish 2022

³⁷ Marine Traffic 2022

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

- 1.4.6.26 Otter trawl gears are used to target queen scallop, particularly by vessels from the Isle of Man. This method, similar to skid dredges, targets queen scallop which are more active swimmers than king scallop. Queen scallop are generally caught during the summer months when water temperatures are higher and they are most active (Jenkins et al., 2003). The typical towing speed varies with ground, tidal and weather conditions, but is generally between two to three knots (Bloor et al., 2015).
- 1.4.6.27 MacNab and Nimmo (2021) found that within the Irish Sea region, vessels deploying otter trawls typically tow their gear at a speed of two to six knots, while the majority of vessels have a vessel length of <10 m.
- 1.4.6.28 MarineSpace, on behalf of the Applicant, engaged with fisheries groups via questionnaires on their gear penetration depth within the commercial fisheries study area. Results found that vessels using otter trawls have a penetration depth ranging from approximately 0.05 m to 0.1 m.

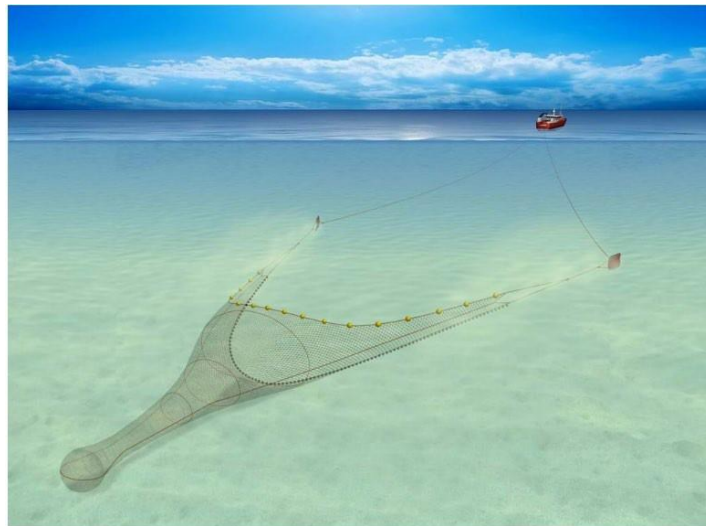


Figure 1.38: Typical demersal trawl gear configuration³⁸.



Figure 1.39: Example demersal trawl vessels³⁹.

³⁸ Seafish 2022

³⁹ Marine Traffic 2022

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Pots and traps

- 1.4.6.29 The shape, size and number of pots and traps used by vessels, varies depending on the target species, size of vessel and seabed substrate. Surface markers used include cans, buoys and flagged dhans buoys (Figure 1.40).
- 1.4.6.30 Pots used to catch whelk often comprise a weighted plastic drum (Figure 1.41). The number of whelk pots deployed is, generally, higher than for crab and lobster on a like-for-like basis but depends on the exact area fished and vessel size. Whelk vessels operating offshore (Figure 1.41) in the commercial fisheries study area may be working strings of approximately 100 pots, whereas vessels targeting crab and lobster, will have strings of approximately 25 to 50 pots.
- 1.4.6.31 Parlour pots are generally utilised for the capture of crab and lobster. The design of these pots typically consists of a steel rod, D-shaped in sections enclosed in netting and protected with rubber strips.
- 1.4.6.32 MacNab and Nimmo (2021) found that within the Irish Sea region, vessels deploying pots and traps typically haul their gear at a speed of 0 to 9 knots and have vessel lengths of both >10 m and ≤ 10 m.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

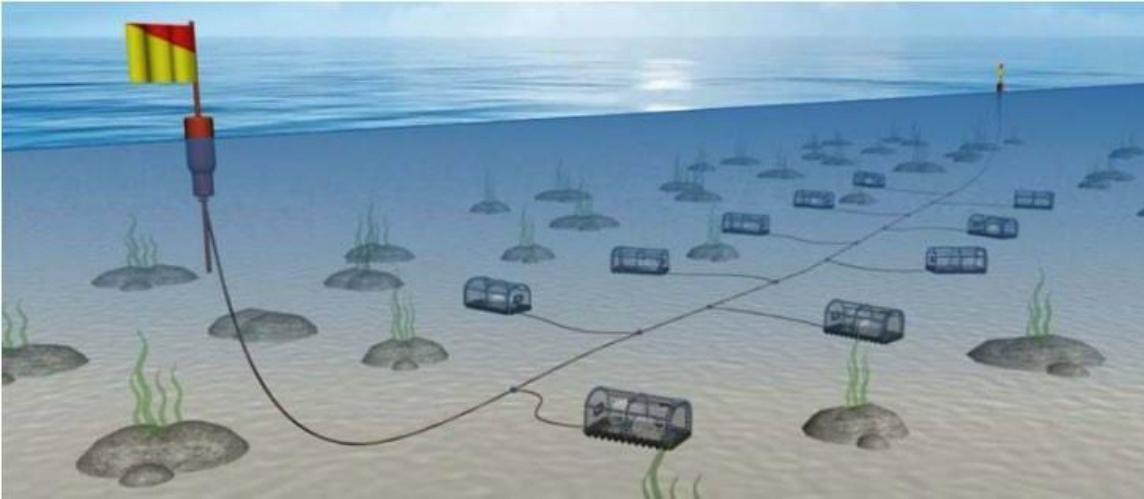


Figure 1.40: Typical potting gear configuration⁴⁰.



Figure 1.41: Typical whelk pot and whelk vessel⁴¹.

Beam trawls

- 1.4.6.33 Beam trawls consist of nets that are held open by a heavy tubular steel beam, which is towed along the seabed. Most beam trawls tow two beams at a time (Figure 1.42). Beam trawling catches a wide range of bottom dwelling species and has the potential to catch a variety of non-target by-catch.
- 1.4.6.34 Beam trawls may use tickler chains, which are attached at the front of the net and slide along the seabed to disturb species of fish within its path, encouraging them to rise up into the net behind.

⁴⁰ Seafish 2022

⁴¹ Seafish, 2022 and MarineTraffic, 2022

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

- 1.4.6.35 MacNab and Nimmo (2021) found that within the Irish Sea region, vessels deploying beam trawls typically tow their gear at a speed of 3.5 to 8 knots, while the majority of vessels have a vessel length of <10 m (Figure 1.43).
- 1.4.6.36 Towing directions vary depending on a range of factors, including tidal and weather conditions.

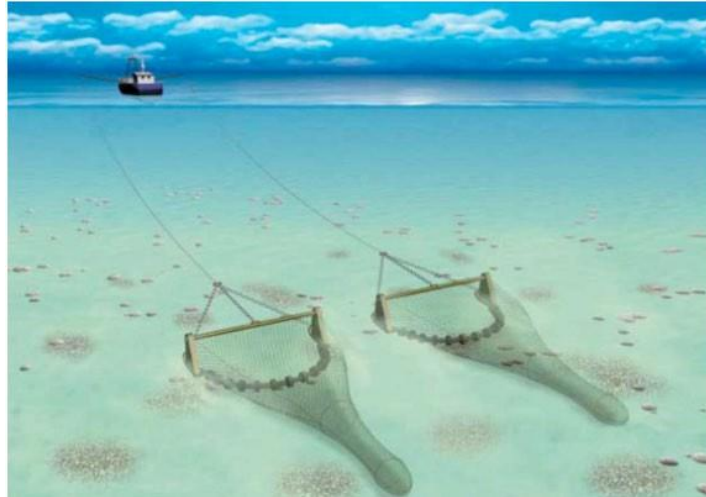


Figure 1.42: Typical beam trawl gear configuration⁴².



Figure 1.43: Beam trawl vessel example⁴³.

1.4.7 Ports

- 1.4.7.1 Figure 1.44 shows fish landings by value (£) into UK and Isle of Man regional ports between 2009 to 2020 (MMO, 2021b). Within the commercial fisheries study area, Fleetwood had the highest value of landings in England between 2009 and 2020; landings into other English ports fluctuated across the time period; landings into the Isle of Man were also high, notably for Douglas, Peel, Port St Mary and Ramsey.

⁴² Seafish 2022

⁴³ Seafish 2022

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

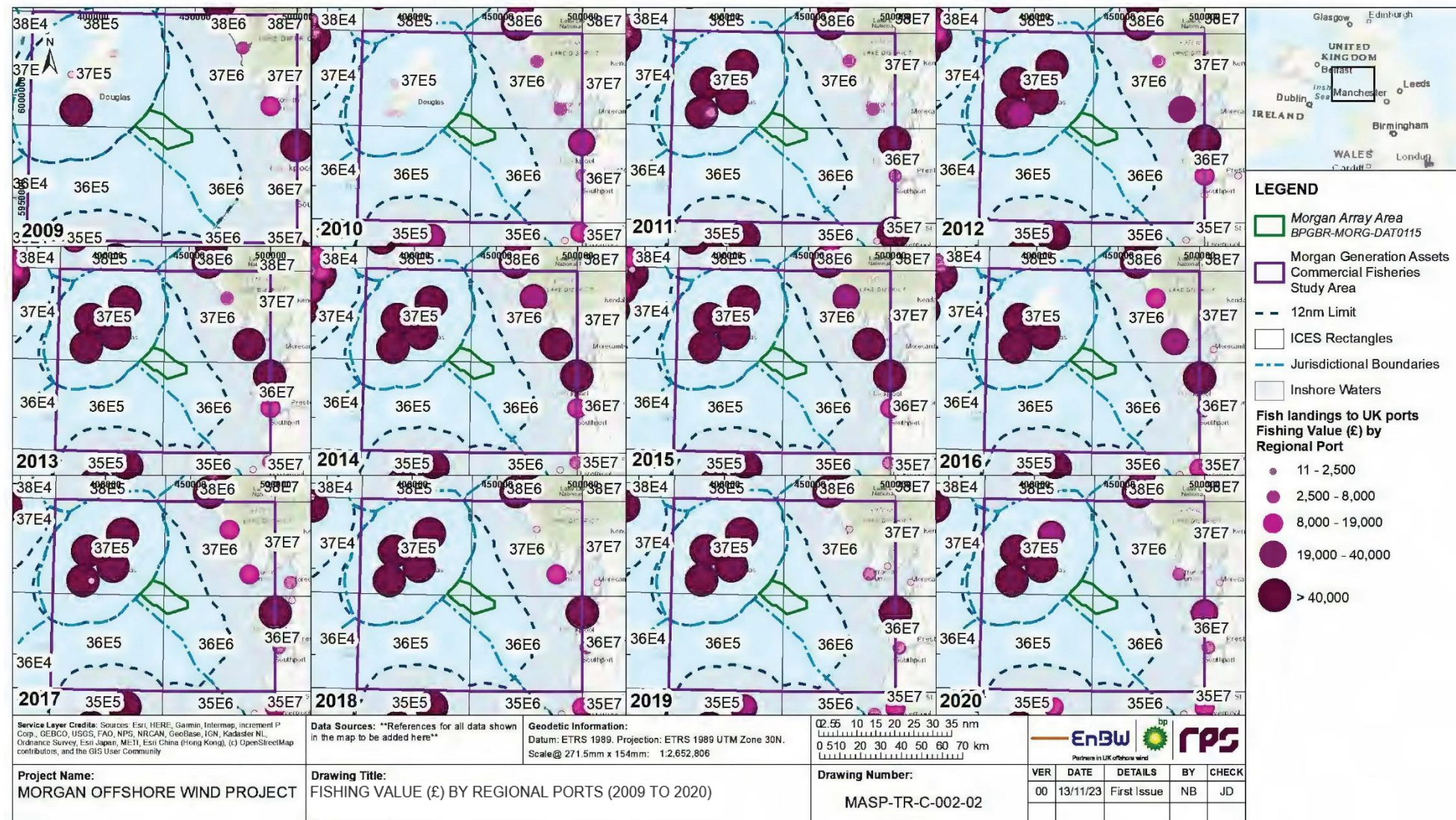


Figure 1.44: Fishing value (£) by regional ports (2009 to 2020)⁴⁴.

⁴⁴ MMO, 2021a

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

- 1.4.7.2 Landings data compiled by the MMO (MMO, 2023b) was reviewed for the period 2012 to 2022 and filtered to just show landings into ports within the commercial fisheries study area. The landings dataset provides summaries of fishing activity for both UK commercial fishing vessels landing into the UK and abroad, as well as foreign registered commercial fishing vessels landing into the UK, that are deemed to have been fishing within a specified calendar year.
- 1.4.7.3 Feedback from project specific consultation with fisheries stakeholders indicated that a large proportion of the shellfish caught within the Morgan Array Area, and wider region, is landed into Fleetwood and Douglas. Therefore, landings into Fleetwood and Douglas have been analysed in this section.
- 1.4.7.4 Data was sorted by port and filtered to analyse details within different vessel size class, species group and nationality of vessels. The data was further sorted by species to then analyse the most important commercial species, in terms of landed weight and value, into each port. This enabled a more detailed analysis of fishing activity from ports within the commercial fisheries study area which are most likely to be affected by the Morgan Generation Assets.

Fleetwood

- 1.4.7.5 Vessels >10 m were dominant, in terms of landed weight, at the port of Fleetwood. Shellfish was the key species group landed into Fleetwood, with a total landed weight between 2012 and 2022 of 6,372 t (Figure 1.45). English vessels landed the majority of shellfish species (Welsh and Scottish vessels also made notable landings of shellfish species). Vessels >10 m from England also landed demersal species into Fleetwood, but total landed weights between 2012 to 2022 were significantly less than those of shellfish species.
- 1.4.7.6 Landed weights in the ≤10 m vessel size class were lower, with demersal and shellfish species landed mostly by English vessels. For both vessel size categories, the pelagic species group was the least dominant by weight and value of landings. No landings of pelagic species were recorded between 2012 to 2022 for vessels >10 m in length.
- 1.4.7.7 A total of 51 species were landed at Fleetwood during 2012 to 2022, with whelk the dominant species in terms of landed weight and value (total value of £6,973,434) (Figure 1.46). This reflects the role of the whelk fishery which operates out of Fleetwood and aligns with feedback from consultation. The next top species in terms of landed weight were lesser spotted dogfish, plaice, thornback ray and crab.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

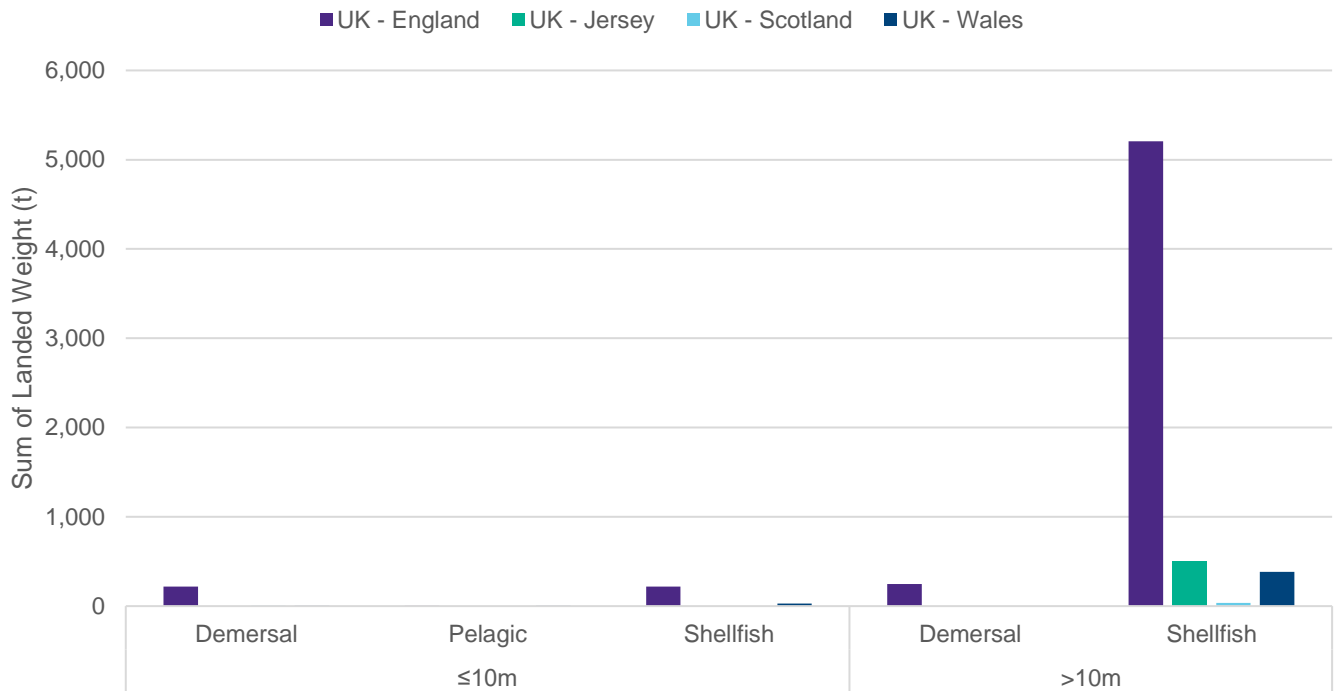


Figure 1.45: Total landings into Fleetwood (2012 to 2022) displayed by species group, vessel length and nationality⁴⁵.

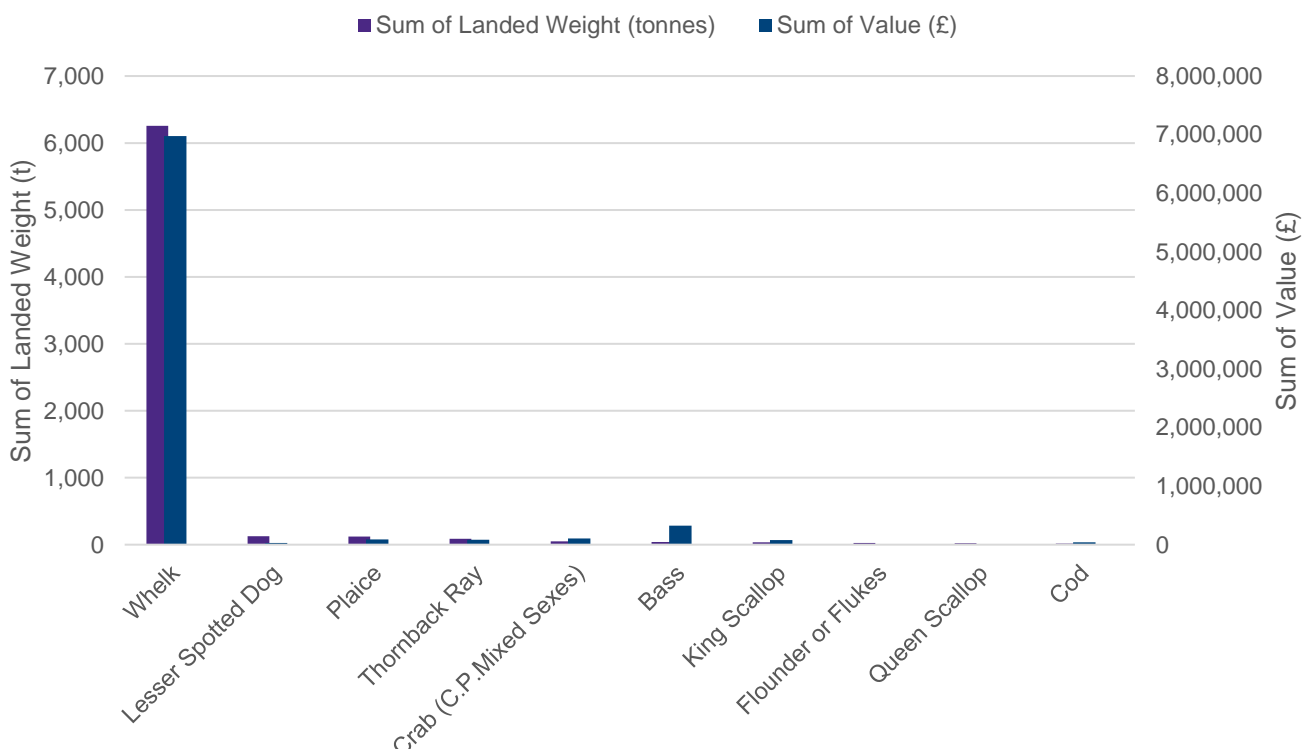


Figure 1.46: Total weight and value of landings into Fleetwood port (2012 to 2022) displayed by the top 10 species by weight⁴⁶.

⁴⁵ MMO 2023b

⁴⁶ MMO 2023b

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Douglas

- 1.4.7.8 Scottish and Isle of Man vessels >10 m dominated the landed weight at the port of Douglas. Shellfish was the key species group landed into Douglas, with a total landed weight between 2012 and 2022 of 29,766 t (Figure 1.47); landings of demersal and pelagic species were low. Isle of Man vessels dominated the ≤10 m shellfish landings into Douglas. For the >10 m landings into Douglas, the highest landings were by Isle of Man vessels, followed by Scottish vessels. English, Northern Irish and Welsh vessels also landed shellfish species into Douglas, but total landed weights between 2012 to 2022 were significantly less.
- 1.4.7.9 A total of 47 species were landed at Douglas during 2012 to 2022. Queen scallop were the dominant species in terms of landed weight and value (Figure 1.48), followed by king scallop and whelk: these three species made up 99% of the landed weight into Douglas. This reflects the role of the scallop and whelk fisheries which operate out of Douglas and within the commercial fisheries study area, which aligns with feedback from consultation. The next top species in terms of landed weight were crab, lobster, lesser spotted dogfish, mackerel, unidentified dogfish, squid and pollack.

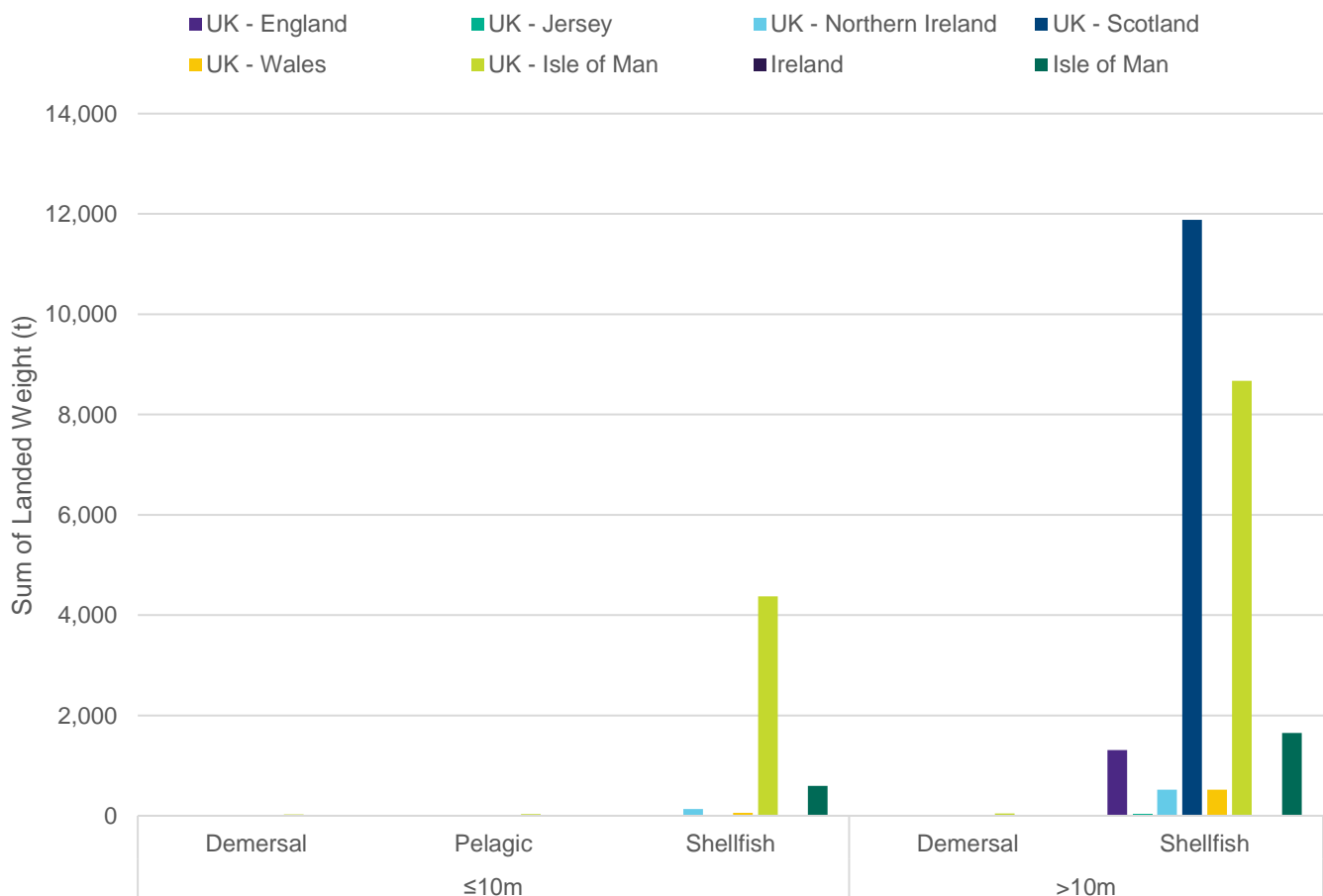


Figure 1.47: Total landings into Douglas (2012 to 2022) displayed by species group, vessel length and nationality⁴⁷.

⁴⁷ MMO 2023b

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

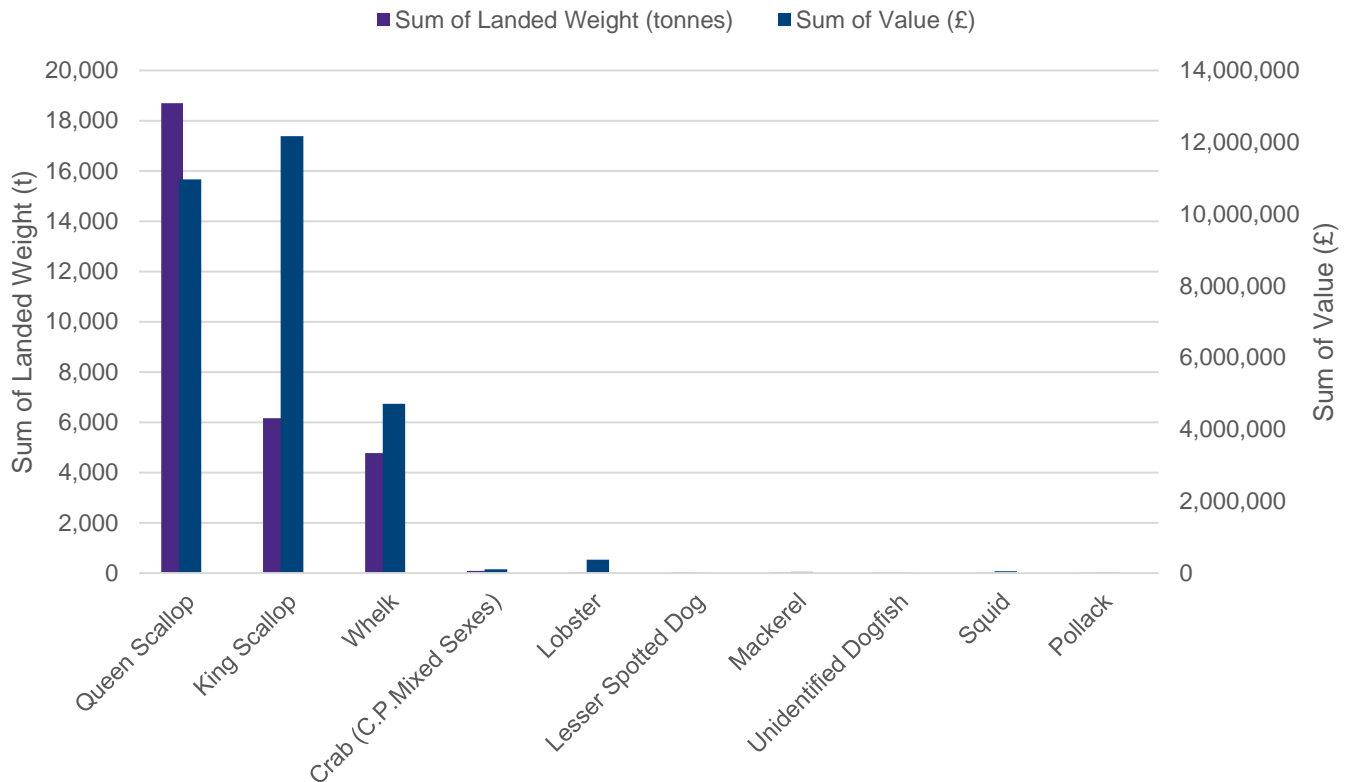


Figure 1.48: Total weight and value of landings into Fleetwood port (2012 to 2022) displayed by the top 10 species by weight⁴⁸.

1.4.8 Spatial distribution of fishing activity

VMS data by gear type

- 1.4.8.1 VMS data between 2009 to 2020 was collated from the MMO and ICES to provide an overview of the spatial extent of fishing activity within the commercial fisheries study area. The MMO dataset only captures data for ≥ 15 m vessels and the ICES dataset is from vessels > 12 m in length. Smaller vessels are not captured within these datasets, so additional datasets have been used to provide a context for their activity. Fishing effort was provided in kWh, which has been calculated by multiplying the time associated with each VMS report, by the engine power of the vessel concerned at the time of activity.
- 1.4.8.2 Both the MMO and ICES datasets are split by the ICES subrectangle and have been categorised into aggregated gear groups (Figure 1.49 to Figure 1.52). The ICES data was only for mobile bottom contacting gear types, so pots and traps were not included. MMO data by gear type for pots has been analysed, but data were only available for the period 2016 to 2020.
- 1.4.8.3 Figure 1.49 illustrates that potting vessels (≥ 15 m) were active across the commercial fisheries study area. Higher intensities of potting activity were observed between Barrow-in-Furness and the English-Welsh maritime boundary, and north of the Isle of Man. Within the commercial fisheries study area, levels of potting were generally higher in the east. Feedback from project specific consultation with fisheries

⁴⁸ MMO, 2020b

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

stakeholders has suggested that this activity is mostly from whelk vessels. Potting activity fluctuated across the time period studied. Activity by <15 m static gear vessels is included in Figure 1.55, Figure 1.61, Figure 1.62, Figure 1.66, the landings data and stakeholder feedback.

- 1.4.8.4 Over the period 2009 to 2020, beam trawl (vessels >12 m) activity within the commercial fisheries study area was focused within two discrete areas (Figure 1.50). One of these areas was located southwest of the Isle of Man. The other area was between the 12 nm limit of England and the Morgan Array Area, and sporadically overlapped with the east part of the Morgan Array Area. Consulted fisheries stakeholders have indicated that beam trawl vessels from the southwest of the UK, and from Belgium, are active within the Morgan Array Area and the wider region during the Spring, with these vessels predominantly targeting sole. Beam trawl activity fluctuated across the time period studied.
- 1.4.8.5 Figure 1.51 illustrates that dredge vessels (>12 m) were active across the commercial fisheries study area. These dredge vessels are largely from Ireland, the Isle of Man, Northern Ireland and Scotland (section 1.4.6). Highest intensities of these vessels were observed within the Isle of Man 12 nm limit, and to the southwest of the Morgan Array Area; high levels of activity overlapped with the west part of the Morgan Array Area. This is supported by feedback from project-specific consultation which highlighted that the west corner of the Morgan Array Area is a particularly important queen scallop fishing ground. It is evident that dredge activity and intensity varies by year, which also corroborates information from fisheries stakeholders, suggesting that the fishery is cyclical over seven to eight year periods.
- 1.4.8.6 Figure 1.52 illustrates that activity by otter trawl vessels (>12 m) was highest in the west and northeast parts of the commercial fisheries study area, with an area of moderate otter trawl activity also located within the east part of the Isle of Man territorial waters. Activity within the Morgan Array Area was generally limited to the northwest part, which is likely Isle of Man vessels targeting scallop. The higher intensity area off the Cumbrian coast shows the Nephrops grounds (Figure 1.52), which do not overlap with the Morgan Array Area. Otter trawl vessels from Belgium, England, Isle of Man, Northern Ireland, Scotland and Wales were active within the commercial fisheries study area (section 1.4.6). Otter trawl activity fluctuated across the time period studied. Feedback from consultation suggested that otter trawl vessels from the Isle of Man target queen scallop, generally between July and October.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

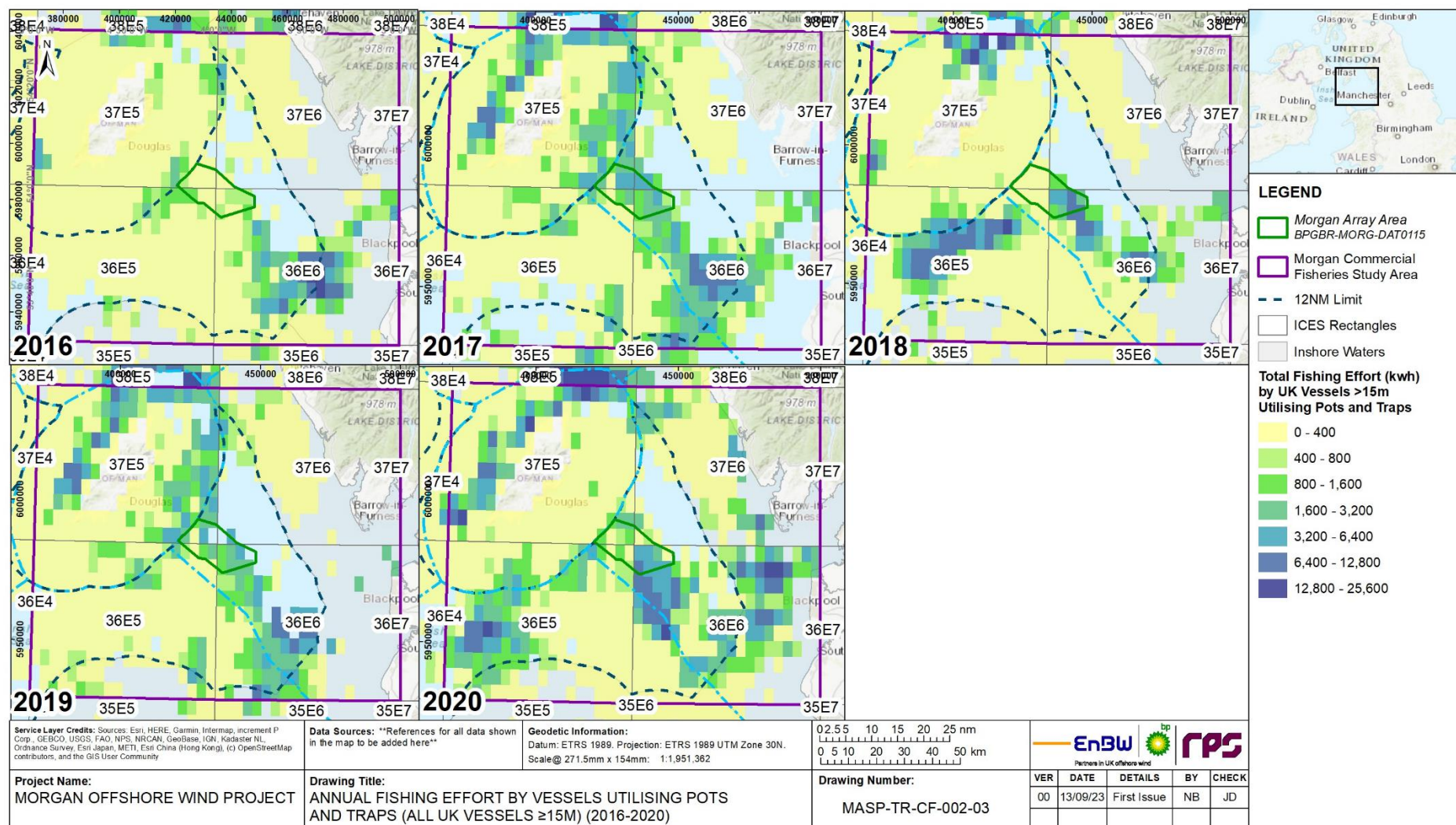


Figure 1.49: Annual fishing effort by vessels utilising pots and traps gear (UK vessels ≥15 m and Isle of Man vessels) (2016 to 2020)⁴⁹.

⁴⁹ MMO, 2021b

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

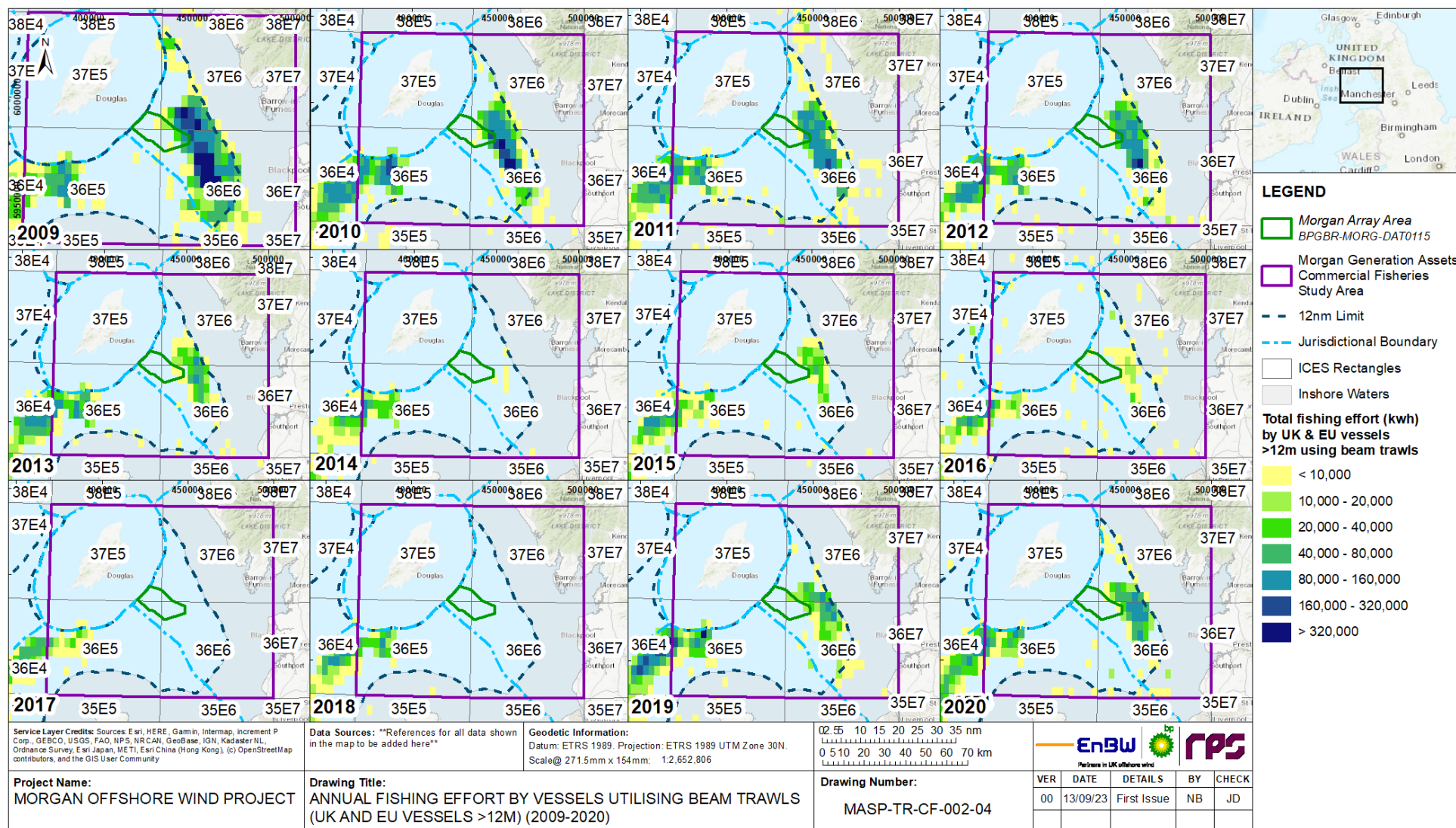


Figure 1.50: Annual fishing effort by vessels utilising beam trawls (UK and EU vessels >12 m) (2009 to 2020)⁵⁰.

⁵⁰ ICES, 2020

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

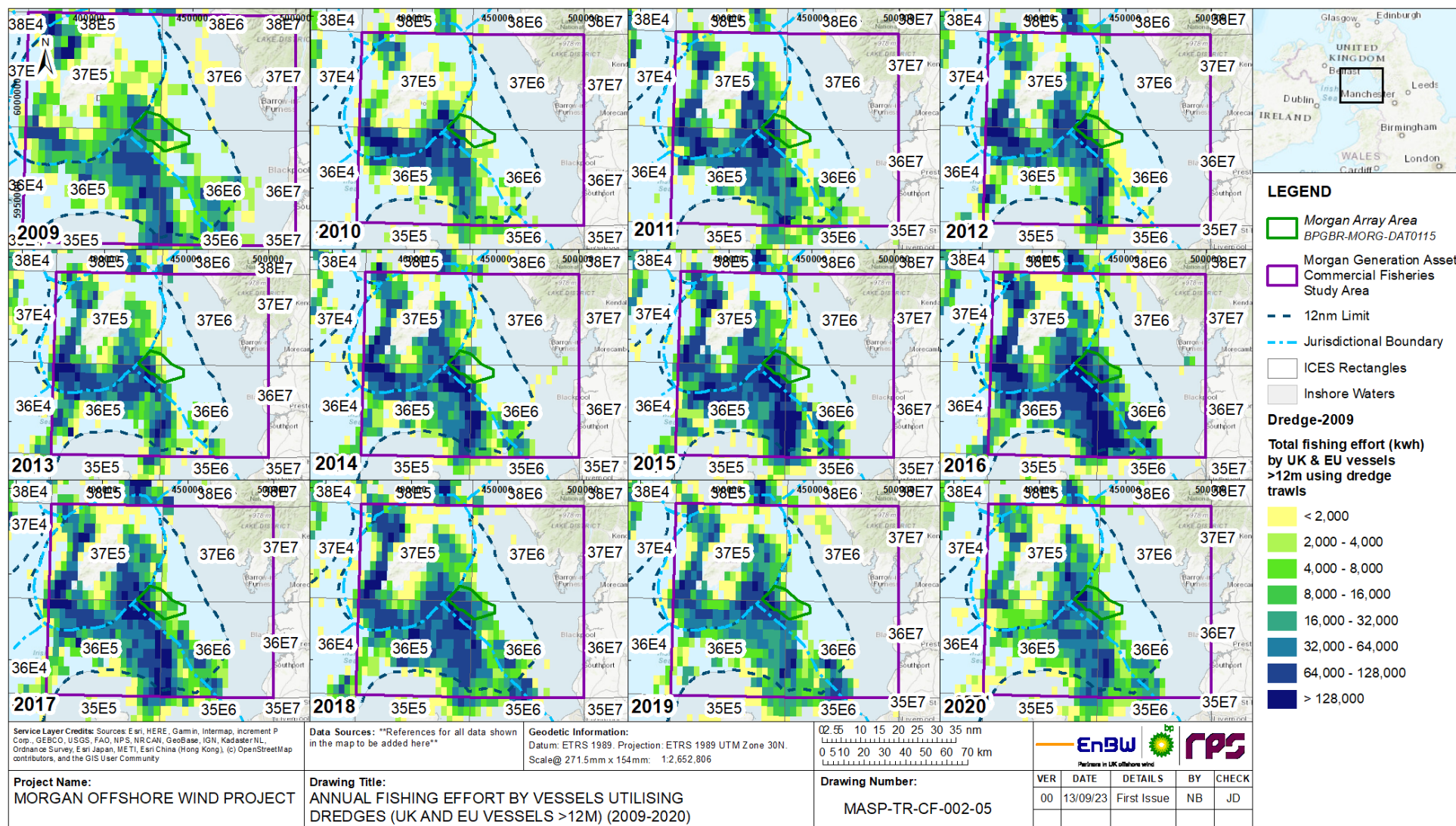


Figure 1.51: Annual fishing effort by vessels utilising dredges (UK and EU vessels >12 m) (2009 to 2020)⁵¹.

⁵¹ ICES, 2020

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

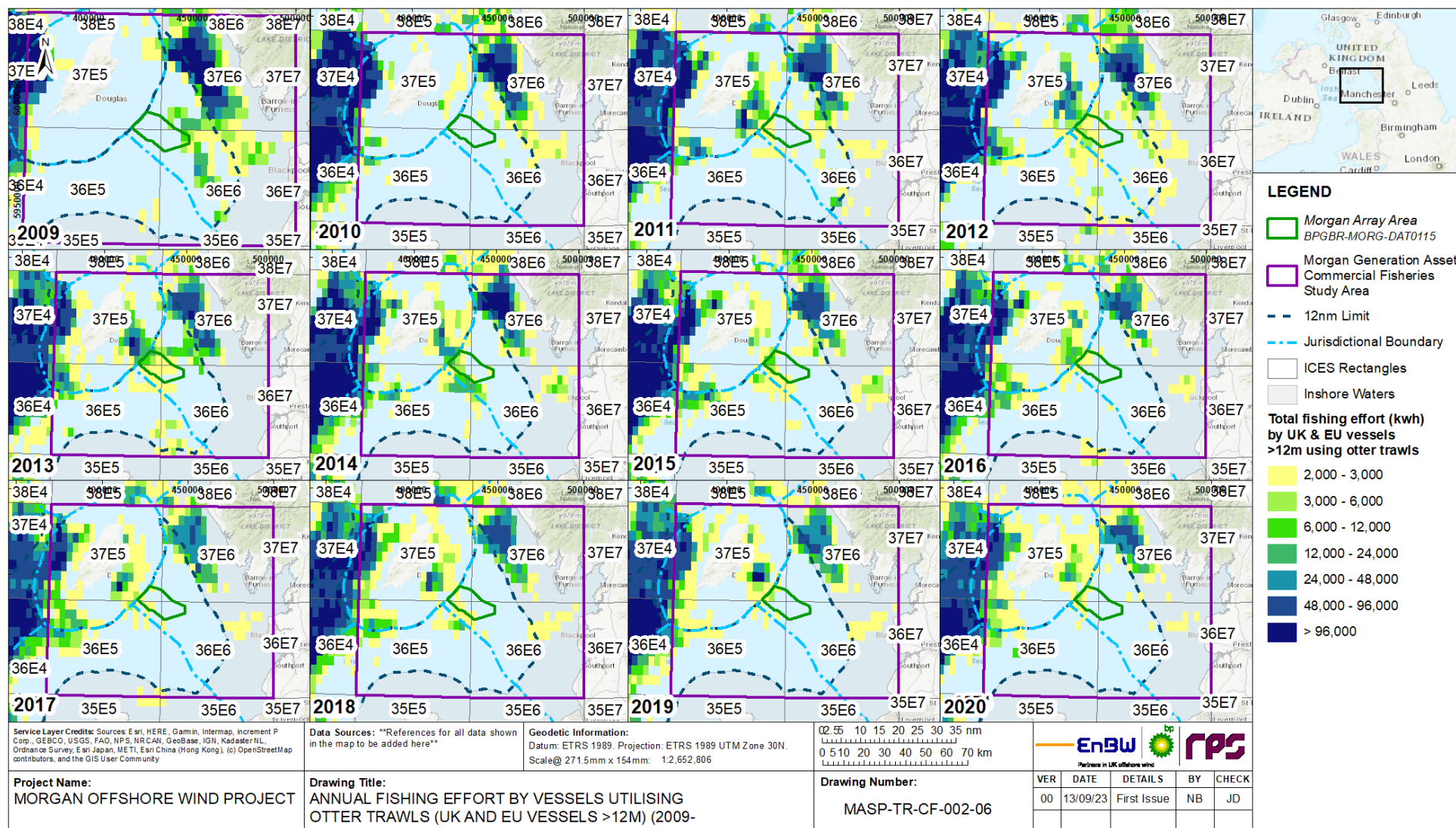


Figure 1.52: Annual fishing effort by vessels utilising otter trawls (UK and EU vessels >12 m) (2009 to 2020)⁵².

⁵² ICES, 2020

Scallop grounds – ICES Scallop Assessment Working Group and consultation feedback

- 1.4.8.7 The ICES Scallop Assessment Working Group (WGSCALLOP) is one of numerous technical fisheries Working Groups established by ICES. WGSCALLOP specifically seeks to develop and improve stock assessment methods for scallop and increase understanding of scallop populations and fisheries.
- 1.4.8.8 WGSCALLOP mapped king scallop fishing activity in the Irish Sea based on VMS data from 2009 to 2019; the data displayed is preliminary, and in the process of being verified by ICES, so has been used to supplement VMS data. This information includes historical data, so may include areas where there is limited fishing intensity (particularly on the edges of the polygons). The VMS data analysed included information on vessels from England, Guernsey, Ireland Jersey, Isle of Man, Scotland and Northern Ireland. This data has been interpreted with care due to the low-medium confidence assigned.
- 1.4.8.9 Figure 1.53 indicates that the king scallop fishery in the Irish Sea overlaps with a large proportion of ICES Rectangles 36E5 and 37E5, the southwest part of 36E6 and only a small part of the southwest part of 37E6. Vessels engaging in the king scallop fishery from the UK showed the largest spatial extent of activity and overlapped with the west part of the Morgan Array Area. Irish vessels overlapped with the west part of the Morgan Array Area. There was a minor overlap of Northern Irish vessel activity within a discrete area of the northwest part of the Morgan Array Area.
- 1.4.8.10 This information is generally consistent with feedback from project specific consultation, which suggested that the king scallop grounds cover a larger area than the queen scallop grounds in the commercial fisheries study area (discussed below).
- 1.4.8.11 VMS data and feedback from fisheries stakeholders (from Scotland and the Isle of Man) indicates that the west part of the Morgan Array Area is the most important area for vessels targeting queen scallop; these areas are displayed in Figure 1.54 which has been produced through close liaison with Scottish fisheries stakeholders and is presented as a guide to inform this technical report. Other parts of the Morgan Array Area and areas beyond the boundary to the north west are of lesser importance for commercial queen scallop fishing but are recognised as important spawning areas.
- 1.4.8.12 Further information on the ecology of scallop is detailed in Volume 4, Annex 3.1: Fish and shellfish ecology technical report of the Environmental Statement.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

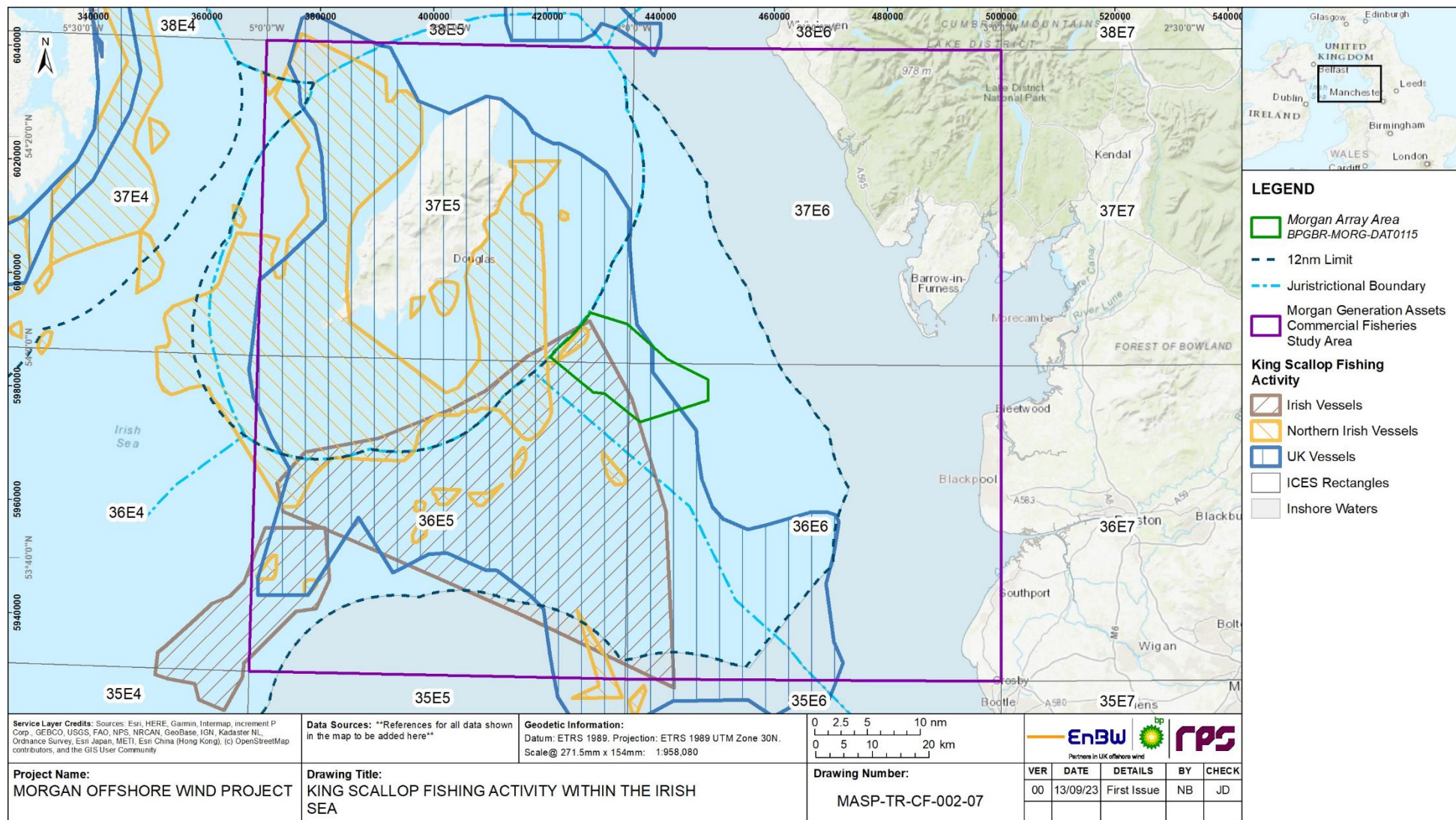


Figure 1.53: King scallop fishing activity within the Irish Sea⁵³.

⁵³ ICES (2020a)

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

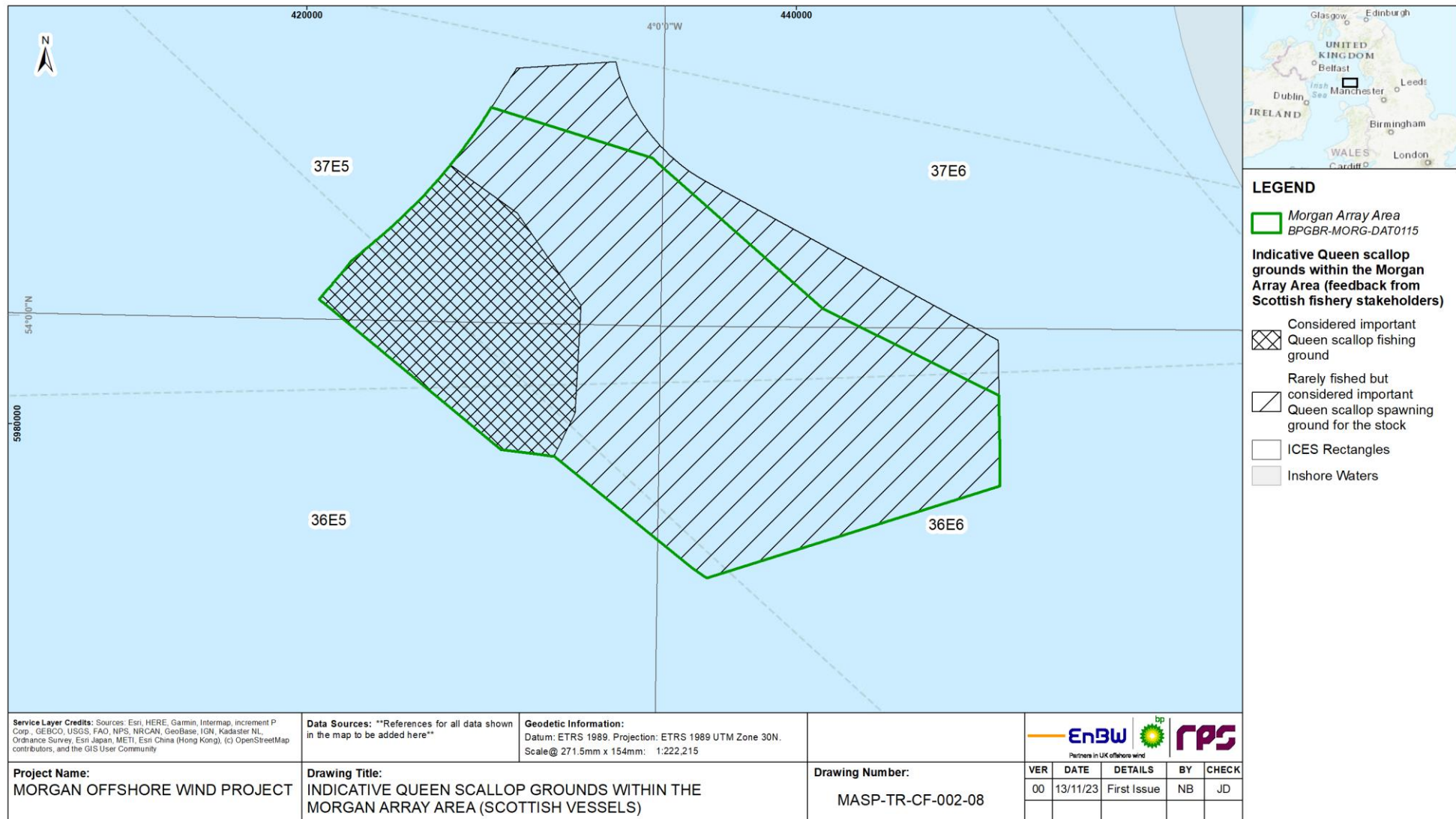


Figure 1.54: Indicative Queen scallop grounds fished by Scottish vessels within the Morgan Array Area⁵⁴.

⁵⁴ WCSP (2022)

UK inshore fishing intensity

- 1.4.8.13 Cefas undertook a study between 2010 and 2012 to provide an improved understanding of inshore fisheries activity (vessels <15 m), with input from the Inshore Fisheries and Conservation Authorities, Welsh Government and the MMO. The dataset is based on sightings and surveillance effort. The various limitations of the data are outlined in section 1.3.1. The maps are purely indicative in nature but have been used to supplement the VMS data which does not capture smaller fishing vessels. The indicative fishing activity illustrated has been cross-referenced with knowledge of the local fleets gathered through informal consultations.
- 1.4.8.14 Figure 1.55 indicates that static gear activity (<15 m vessels) was relatively low within the inshore parts of the commercial fisheries study area. This generally aligns with feedback from project-specific consultation and information collected through site-specific surveys (section 1.4.9).
- 1.4.8.15 Figure 1.56 indicates that mobile gear activity (<15 m vessels) within the inshore areas was highest off the Cumbrian coast and the Welsh coast, which is also evident within the VMS data.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

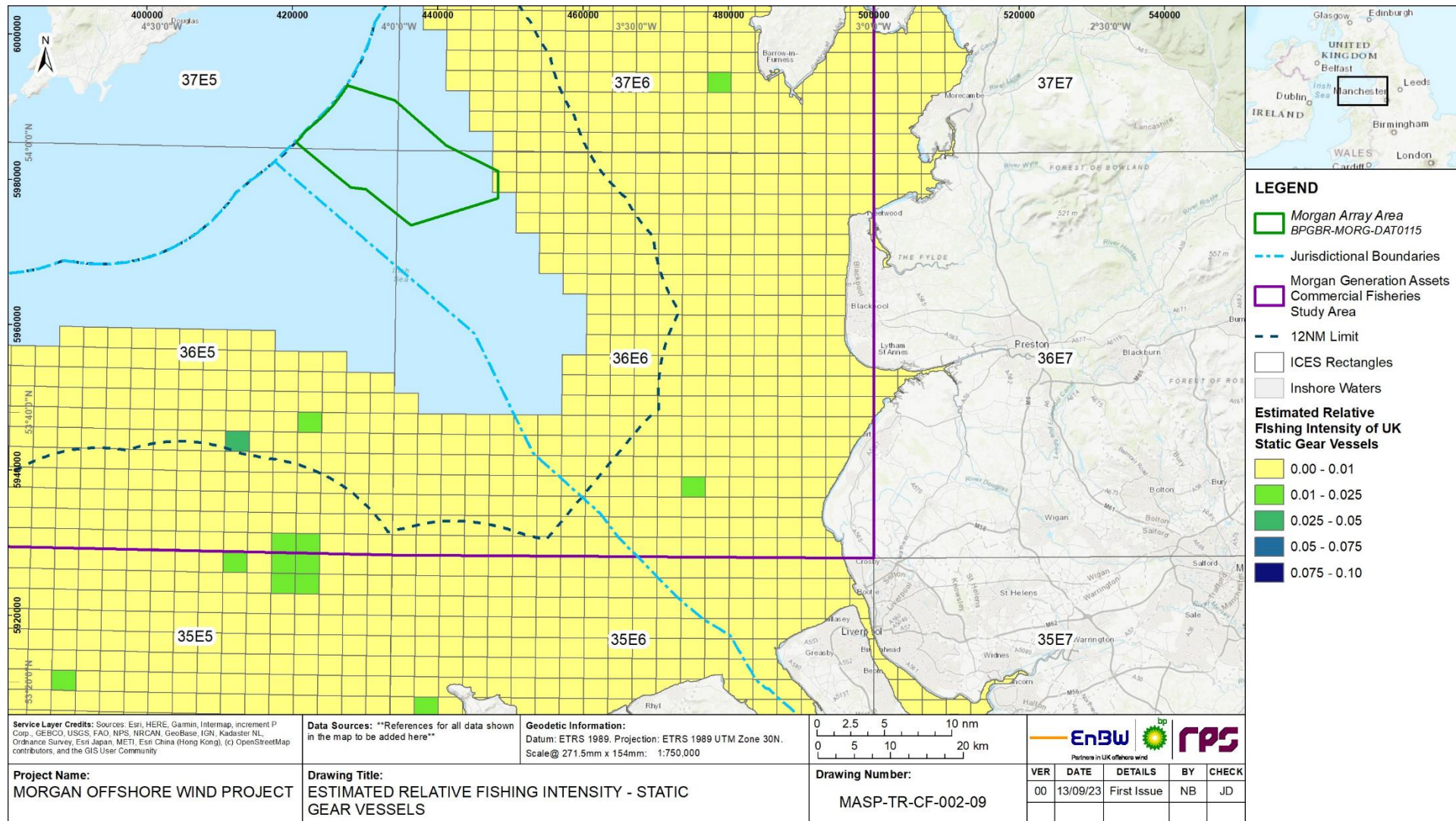


Figure 1.55: Estimated relative fishing intensity – static gear vessels⁵⁵.

⁵⁵ CEFAS, 2014

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

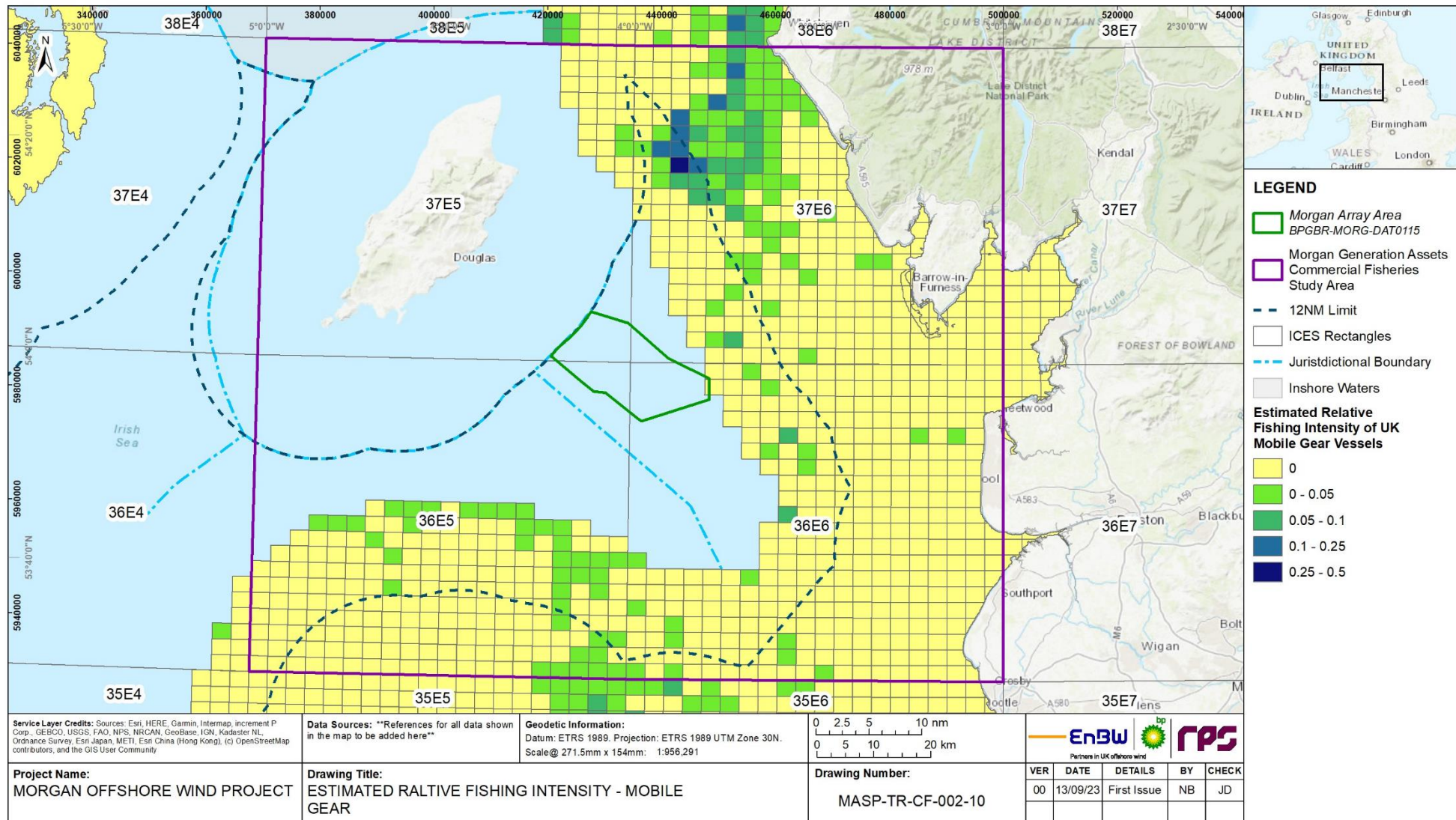


Figure 1.56: Estimated relative fishing intensity – mobile gear vessels⁵⁶.

⁵⁶ CEFAS, 2014

Isle of Man king scallop dredge and queen scallop trawl/dredge swept area data

- 1.4.8.16 King scallop and queen scallop swept area (km²) data between 2017 to 2023 was collated from the Isle of Man Government to provide an overview of the spatial extent of fishing activity within and around Manx territorial waters. All licenced scallop fishing vessels, regardless of size and country of origin, are required to operate a VMS system in Manx Territorial Waters. As such, data for all king scallop (dredge) and queen scallop (otter trawl/dredge) vessel sizes are available, with the dataset not being limited to vessels >15 m, or >12 m in length. The dataset provided are split by IS Boxes, which are used to collect data for the Isle of Man Nest Forms Electronic Daily Scallop Catch Return.
- 1.4.8.17 Figure 1.57 illustrates that dredge vessels targeting king scallop were active across the Manx Territorial Sea, at varying intensities (2017 to 2023). Highest intensities can generally be observed within the Isle of Man 12 nm limit and to the west of the Morgan Array Area; high levels of activity overlapped with the northwestern part of the Morgan Array Area. Lowest levels of activity can be observed beyond the Isle of Man 12 nm limit. It is evident that dredge activity and intensity varies by year, which also corroborates information from fisheries stakeholders, suggesting that the fishery is cyclical over seven to eight year periods.
- 1.4.8.18 Figure 1.58 illustrates that activity by dredge and otter trawl vessels targeting queen scallop was generally highest in the south eastern section of ICES Rectangle 37E5, overlapping with the northwestern part of the Morgan Array Area (2018 to 2022). Other areas of relatively high activity can be observed within the Isle of Man Territorial Sea, particularly in areas to the north and south of the Isle of Man. Lowest levels of activity can be observed beyond the Isle of Man 12 nm limit. Activity fluctuated across the time period studied.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

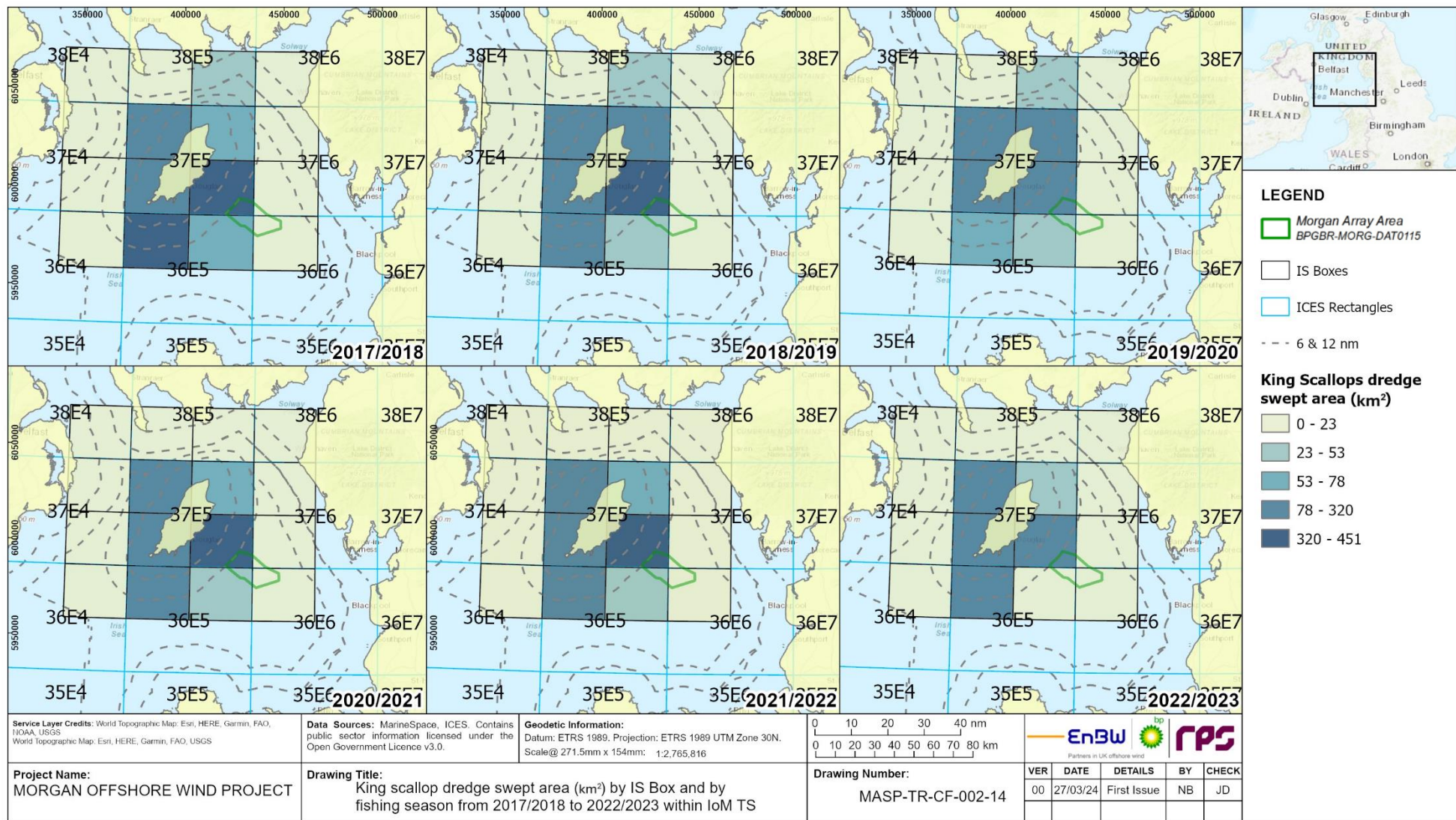


Figure 1.57: King scallop dredge swept area (km²) by IS Box within and around the Isle of Man Territorial Sea (2017/18 to 2022/23)⁵⁷

⁵⁷ DEFA, 2023

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

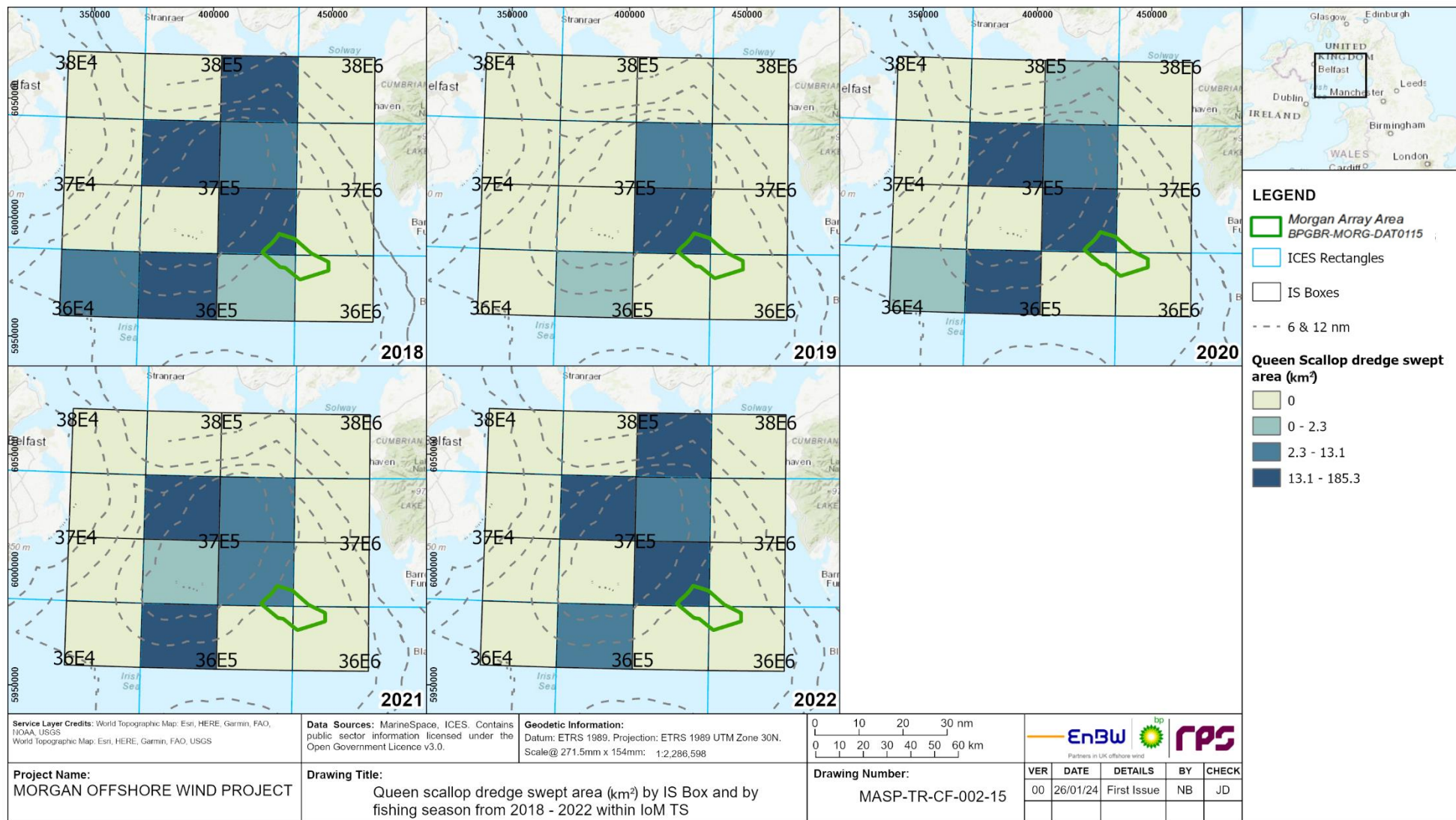


Figure 1.58: Queen scallop swept area (km²) by IS Box within and around the Isle of Man Territorial Sea (2018 to 2022)⁵⁸

⁵⁸ DEFA, 2023

Isle of Man crab, lobster and whelk pot haul data

- 1.4.8.19 Combined total crab and lobster pot haul, and whelk pot haul data was collated from the Isle of Man Government. The data was provided at Monthly Shellfish Activity Report (MSAR) square level for 2010 to 2021. MSAR squares only report on activity within ICES Rectangle 37E5, for all Manx registered vessels.
- 1.4.8.20 Figure 1.59 illustrates that Isle of Man registered static gear vessels, targeting crab and lobster, were active across ICES Rectangle 37E5 at varying degrees (2010 to 2021). Higher intensities of crab and lobster pot haul effort were observed to the south and west of the Isle of Man, within the Manx 6 nm limit. Lower levels of activity can generally be observed to the west of the Isle of Man and beyond the Manx 6 nm limit. An overlap of crab and lobster pot haul effort can be observed with the Morgan Array Area, although this is at a relatively low level.
- 1.4.8.21 Figure 1.60 illustrates that Isle of Man registered static gear vessels, targeting whelk, were active across ICES Rectangle 37E5 at varying degrees (2010 to 2021). Higher intensities of whelk pot haul effort were observed within the Manx 6 nm limit particularly in areas to the south east of the Isle of Man. Lower levels of activity can generally be observed in all areas of ICES Rectangle 37E5 beyond the Manx 6 nm limit. An overlap of whelk pot haul effort can be observed with the Morgan Array Area, although this is at a relatively low level.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

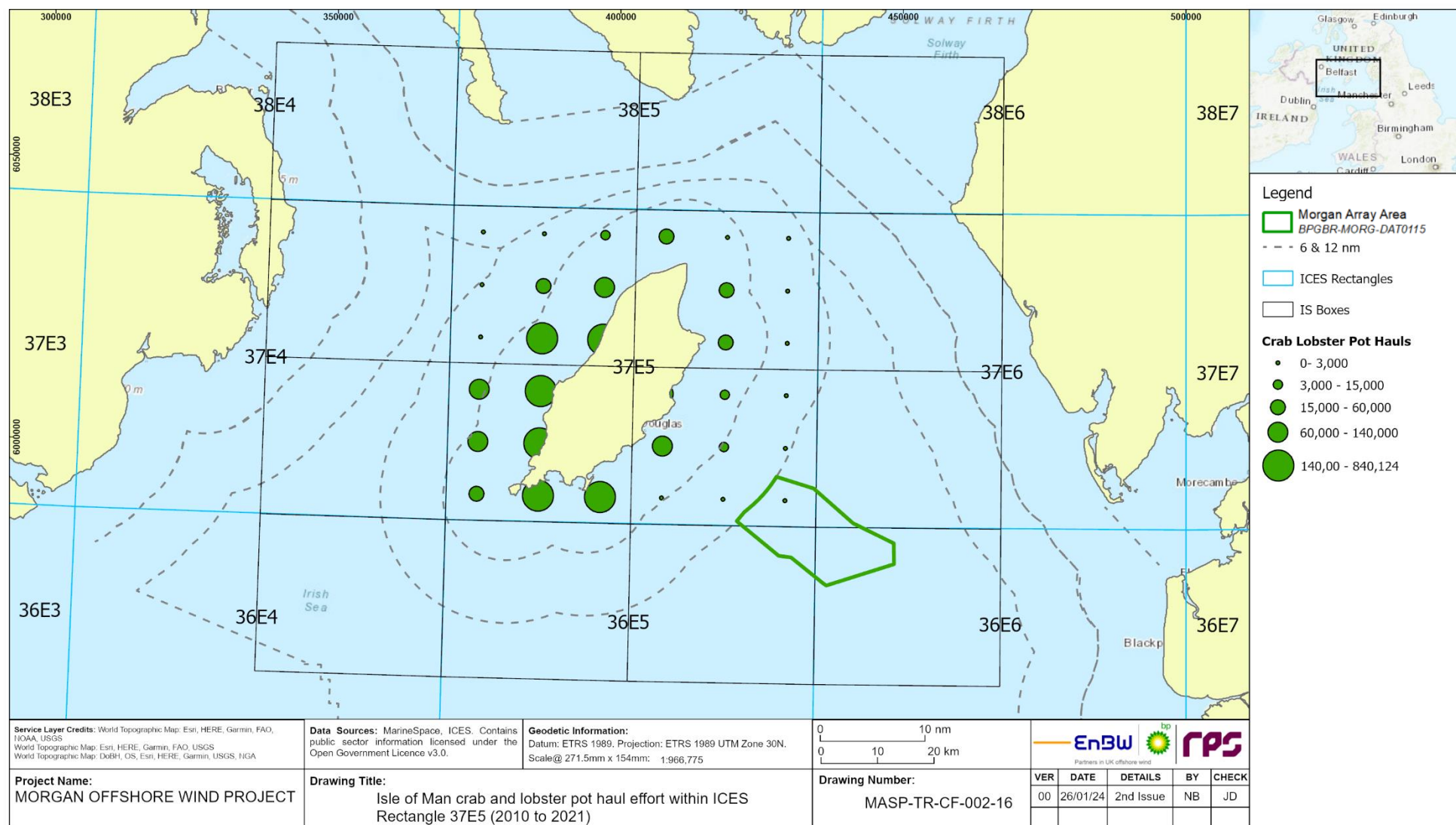


Figure 1.59: Isle of Man crab and lobster pot haul effort within ICES Rectangle 37E5 (2010 to 2021)⁵⁹

⁵⁹ DEFA, 2023

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

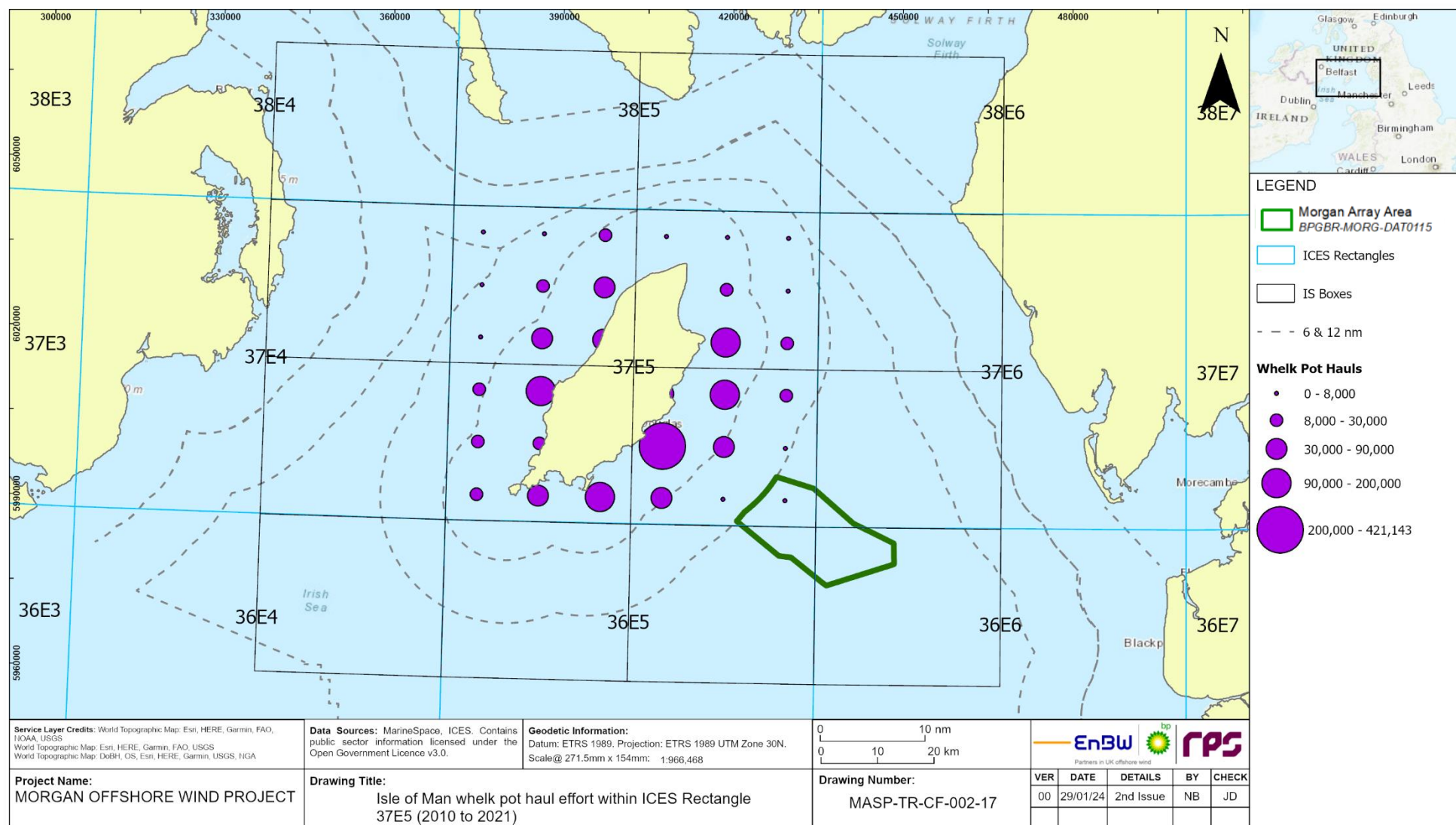


Figure 1.60: Isle of Man whelk pot haul effort within ICES Rectangle 37E5 (2010 to 2021)⁶⁰

⁶⁰ DEFA, 2023

1.4.9 Site-specific surveys

1.4.9.1 To complement the official commercial fisheries landings and activity data described in the previous sections, the following section provides additional information on commercial fishing activity in the Morgan Generation Assets commercial fisheries study area.

Vessel traffic surveys

1.4.9.2 A summary of the fishing vessels identified during the three Morgan Array Area specific vessel traffic surveys (Winter 2021, Summer 2022 Spring 2023 and November 2023) is presented in Table 1.6. Table 1.6 also includes fishing vessels identified during the Summer 2023 vessel traffic survey undertaken for the Morgan and Morecambe Offshore Wind Farms: Transmission Assets. Names and sizes of vessels were only captured by the AIS data, so there may have been additional fishing vessels active in the commercial fisheries study area that are not listed here⁶¹. Figure 1.61 also displays fishing vessel tracks which were detected by radar from the same time periods as the vessel traffic surveys, however information is not provided on the individual fishing vessels.

Table 1.6: Summary of fishing vessels identified during the Morgan Generation Assets vessel traffic surveys 21 November to 04 December 2021, 15 to 29 July 2022, 04 to 18 May 2023, 03 to 17 August 2023 and 11 to 27 November 2023.

Length (m)	Time period	Vessel type	Nationality
9.95	December 2021	Scallop vessel (trawler)	Isle of Man
13.2	December 2021	Static gear vessel	UK
16	December 2021	Scallop vessel (dredge)	UK
18.25	December 2021	Guard vessel	UK
20.5	December 2021	Scallop vessel (dredge)	UK
20.5	December 2021	Guard vessel	UK
23	December 2021	Scallop vessel (dredge)	UK
30.57	December 2021	Scallop vessel (dredge)	UK
34.1	December 2021	Scallop vessel (dredge)	UK
13.2	July 2022	Static gear vessel	UK
15	July 2022	Scallop vessel (dredge)	UK
16	July 2022	Guard vessel	UK
38	May 2023	Beam trawler	Belgium
21.3	May 2023	Scallop vessel (dredge)	UK
16	May 2023	Beam trawler	UK
16	May 2023	Static gear vessel (pots)	UK
16	May 2023	Otter trawler	UK

⁶¹ It has been observed that some scallop vessels which fish in the area turn off their AIS during fishing, so may only be captured during steaming.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Length (m)	Time period	Vessel type	Nationality
16	May 2023	Otter trawler	UK
15	May 2023	Otter trawler	UK
15	May 2023	Scallop vessel (dredge)	UK
15	May 2023	Scallop vessel (dredge)	UK
14	May 2023	Otter trawler	UK
13	May 2023	Scallop vessel (dredge)	UK
13	May 2023	Otter trawler	UK
13	May 2023	Otter trawler	UK
12	May 2023	Otter trawler	UK
10	May 2023	Static gear vessel/ Otter trawler	UK
38	August 2023	Beam trawler	Belgium
13	August 2023	Static gear vessel	UK
n/a	August 2023	Unidentified	n/a
24	November 2023	Scallop vessel (dredge)	UK
34	November 2023	Scallop vessel (dredge)	UK
23	November 2023	Scallop vessel (dredge)	UK
21.3	November 2023	Scallop vessel (dredge)	UK
23.66	November 2023	Scallop vessel (dredge)	UK
23	November 2023	Scallop vessel (dredge)	UK
24	November 2023	Scallop vessel (trawler)	UK
n/a	November 2023	Unidentified	n/a
n/a	November 2023	Unidentified	n/a

1.4.9.3 During the winter survey, nine fishing vessels were identified from the AIS data, six of which were scallop vessels, two were providing guard vessel services and one was a static gear vessel (Table 1.6). Of the nine vessels, seven were >18 m in length, one was 13.2 m and one was 10 m. The static gear vessel and the scallop vessel (trawler) would not have been captured within the VMS data, which includes vessels ≥ 15 m. Eight of the fishing vessels identified were UK registered and the scallop vessel (trawler) was from the Isle of Man.

1.4.9.4 Out of the nine vessels detected by AIS data during the winter survey, only three were active within the Morgan Array Area during this time period, all of which were scallop vessels. The three scallop vessels generally appeared to be fishing within the northwest part of the Morgan Array Area, adjacent to the Isle of Man territorial sea but not within it (Figure 1.61); they were assumed to be fishing as they showed an average speed of approximately 2.9 to 3.6 knots. Figure 1.61 also indicates that scallop vessels were transiting through the west part of the Morgan Array Area, likely transiting between Scotland and fishing grounds south or west of the Morgan Array Area: speed of these vessels was generally over 7 kn. This information aligns with feedback from project-specific consultation and analysis of VMS data that the west corner of the Morgan Array Area is the most important area for commercial fishing vessels targeting scallop (for example, see Figure 1.54).

1.4.9.5 The radar data collected during the winter survey indicated that there was a high level of fishing activity within the Isle of Man territorial sea, approximately 7 to 14 km

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

northwest of the Morgan Array Area (Figure 1.61). This is likely to be an area that is targeted for scallop by Isle of Man vessels, and the VMS data for otter trawl vessels aligns with this area (Figure 1.52).

- 1.4.9.6 During the summer survey, three fishing vessels were identified from the AIS data, one of which was also observed during the winter survey. Of the three vessels, one was a guard vessel (16 m in length), one was a static gear vessel (13.2 m in length) and one was a scallop vessel (15 m in length) (Table 1.6). All fishing vessels identified were UK registered.
- 1.4.9.7 Of the three fishing vessels detected by AIS during the summer survey, the guard vessel and static gear vessel were identified within the Morgan Array Area, within the northeast part (Figure 1.62). The scallop vessel was assumed to be fishing as its speeds were between approximately 2.5 to 4.8 kn; it was observed fishing in a northwest to southeast direction, approximately 3.8 km west of the Morgan Array Area.
- 1.4.9.8 The radar data collected during the summer survey showed a fishing vessel operating out of Douglas on the Isle of Man, steaming to beyond the Isle of Man territorial sea and appeared to be towing within the northwest part of the Morgan Array Area (Figure 1.62).
- 1.4.9.9 During the Spring 2023 survey, 15 fishing vessels were identified from the AIS data, four of which were scallop vessels, seven were otter trawl vessels, two were beam trawl vessels, one was a static gear vessel and one was a static gear/otter trawl vessel (Figure 1.63). Of the 15 vessels, nine were ≥ 15 m and six were < 15 m in length. The fishing vessels under the smaller size category would not have been captured within the VMS data, as this includes vessels ≥ 15 m. 14 of the fishing vessels identified were UK registered and the beam trawl (38 m in length) was from Belgium.
- 1.4.9.10 Out of the 15 vessels detected by AIS data during the Spring 2023 survey, only four were active within the Morgan Array Area during this time period, two of which were scallop vessels, one was an otter trawl vessel and one was a static gear vessel/scallop vessel. The four identified vessels appeared to be fishing within the central and north most part of the Morgan Array Area, adjacent to the Isle of Man territorial sea, and within it (Figure 1.63). This information aligns with feedback from project-specific consultation and analysis of VMS data that the west corner of the Morgan Array Area is the most important area for commercial fishing vessels targeting scallop (for example, see Figure 1.54).
- 1.4.9.11 The radar data collected during the Spring 2023 survey indicated that there was a high level of fishing activity within the Isle of Man territorial sea (Figure 1.63). This is likely to be an area that is targeted for scallop by Isle of Man vessels, and the VMS data for otter trawl vessels and the Isle of scallop trawl/dredge swept area data aligns with this area (Figure 1.63).
- 1.4.9.12 During the Summer 2023 survey, three fishing vessels were observed from the AIS data, one of which was a Belgian beam trawler, another a UK registered static gear vessel and one that was unidentified during the survey. No fishing activity was observed to overlap with the Morgan Array Area, all vessel tracks were observed to the south east of the Morgan Array Area. It is noted, however, that this survey was undertaken to inform the Morgan and Morecambe Offshore Wind Farms: Transmission Assets.
- 1.4.9.13 During the Winter 2023 survey, seven fishing vessels were identified from the AIS and radar data, all of which were scallop vessels (six scallop dredge and one scallop trawler). Two other fishing vessel tracks were recorded during the Winter 2023 survey, however the vessel type was unidentified. The identified scallop vessels appeared to

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

be fishing within the central and western part of the Morgan Array Area and in a north to south orientation (Figure 1.65). This information aligns with feedback from project-specific consultation and analysis of VMS data (for example, see Figure 1.54).

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

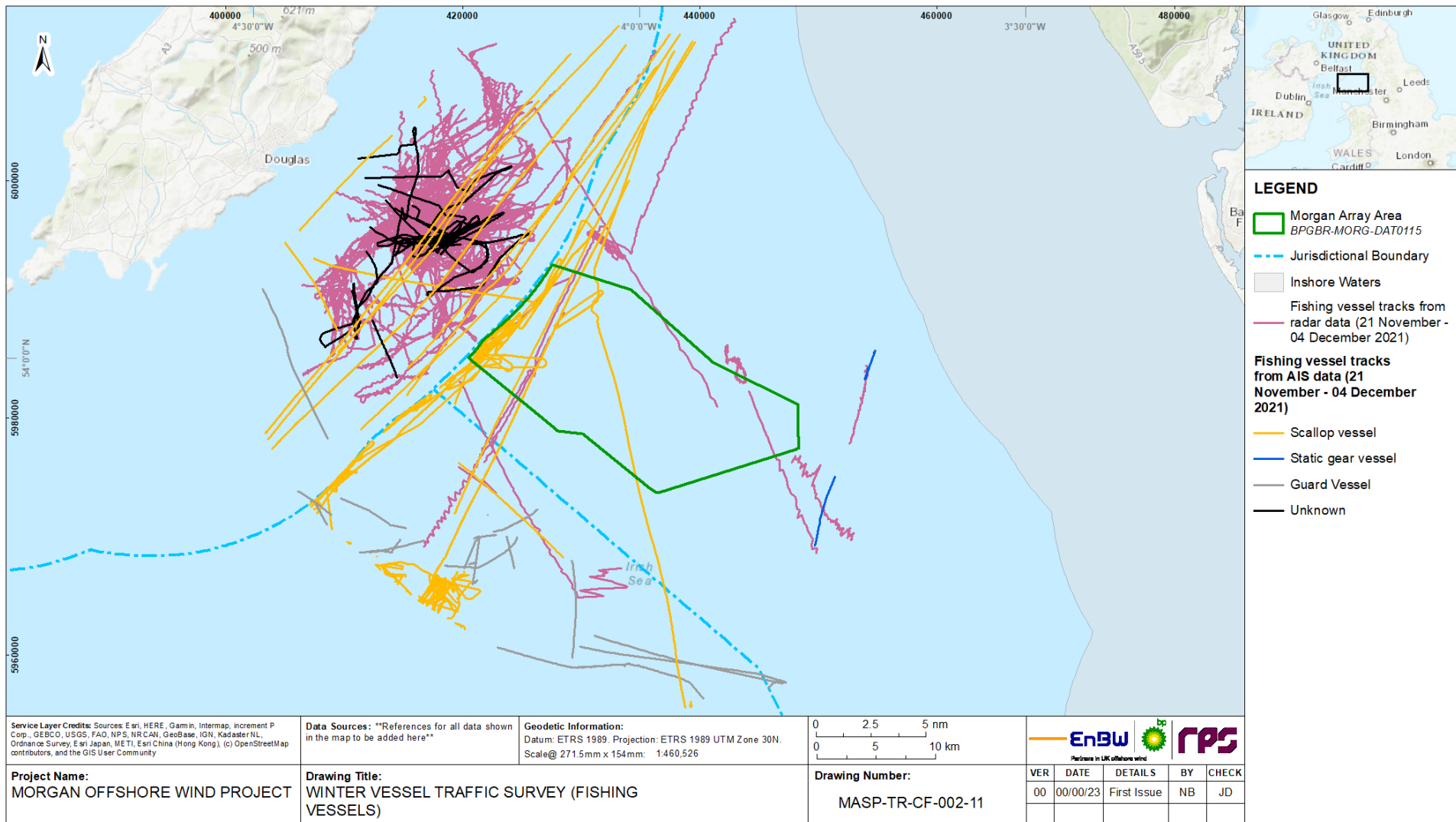


Figure 1.61: AIS fishing vessel track data from 21 November to 04 December 2021⁶².

⁶² NASH Maritime, 2021

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

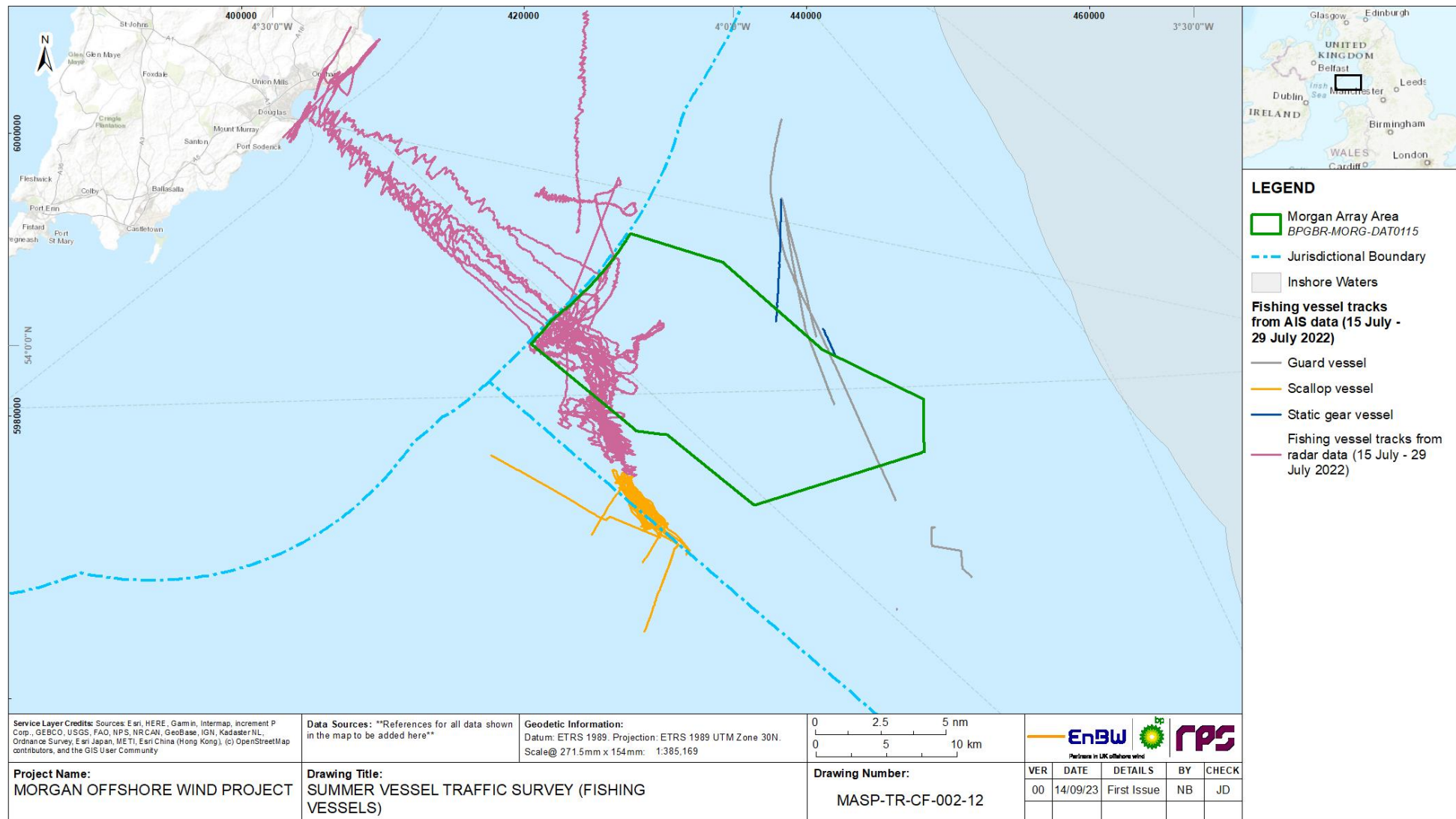


Figure 1.62: AIS fishing vessel track data from 15 to 29 July 2022.⁶³

⁶³ NASH Maritime, 2022

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

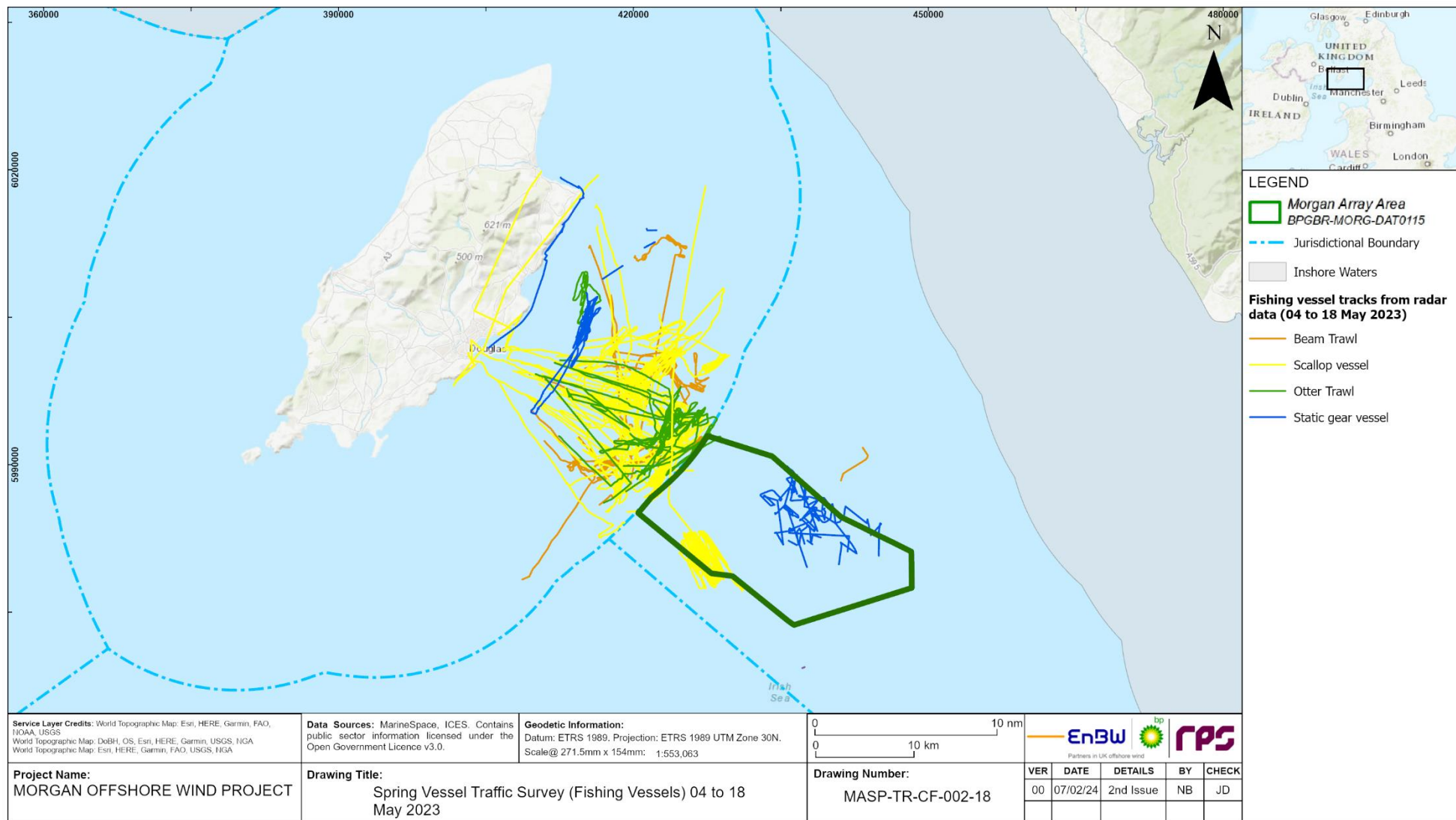


Figure 1.63: AIS fishing vessel track data from 04 to 18 May 2023⁶⁴.

⁶⁴ NASH Maritime, 2023

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

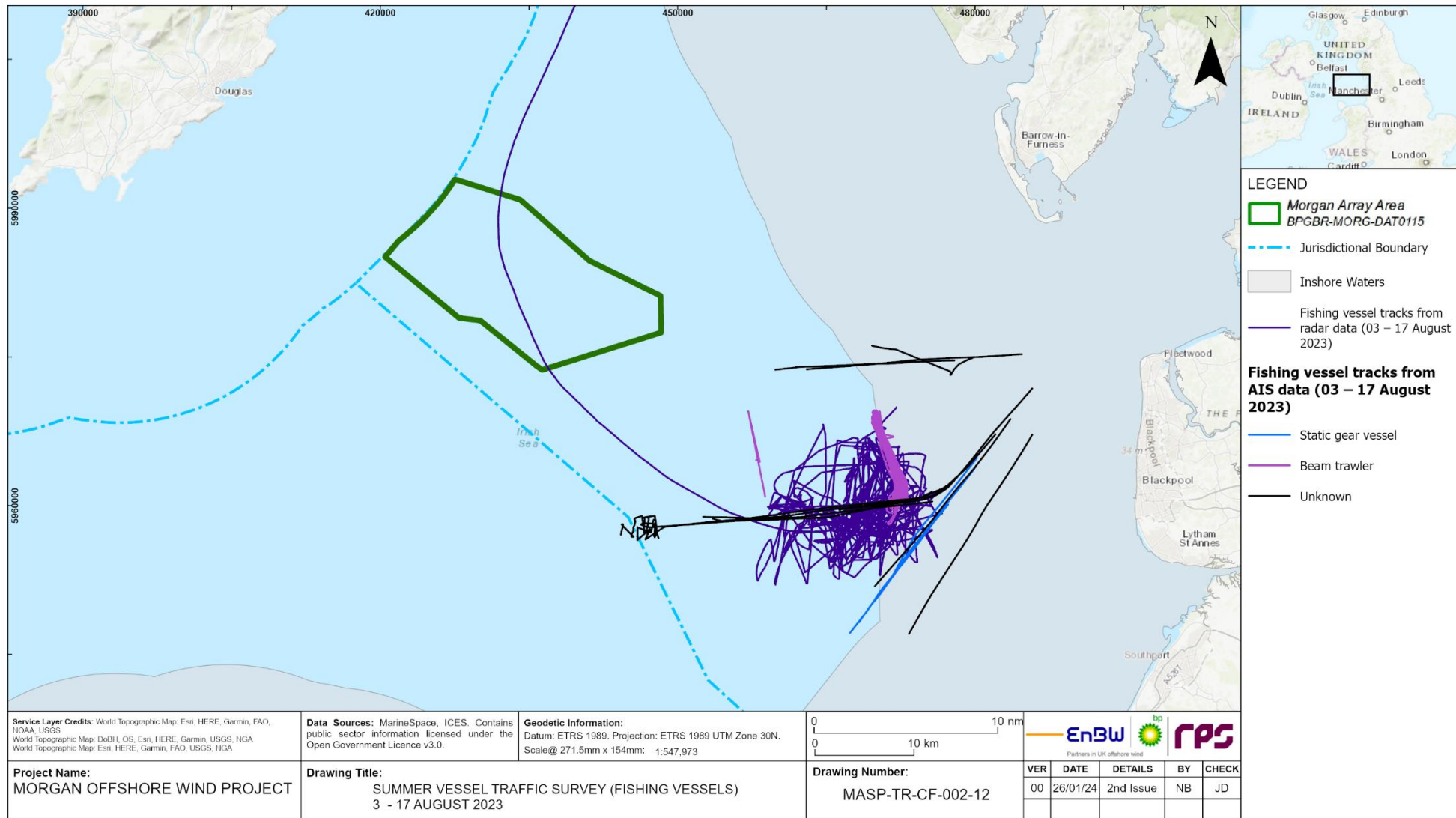


Figure 1.64: AIS fishing vessel track data from 03 to 17 August 2023⁶⁵.

⁶⁵ NASH Maritime, 2023

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

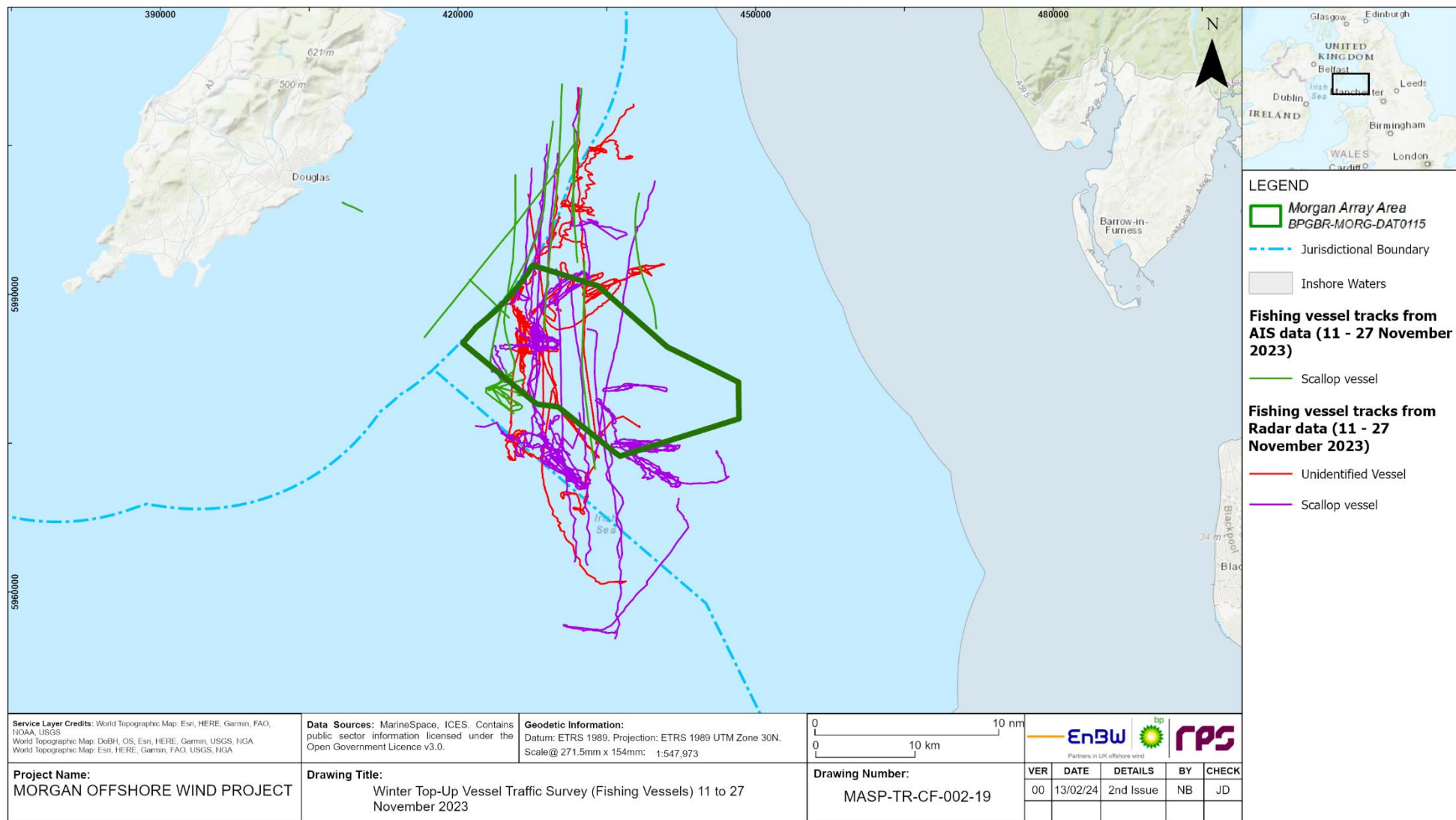


Figure 1.65: AIS fishing vessel track data from 11 to 27 November 2023⁶⁶.

⁶⁶ NASH Maritime, 2023

OFLO and MarineSpace observations

- 1.4.9.14 A summary of the fishing vessels identified by the OFLO present during the offshore geophysical, environmental and geotechnical surveys undertaken in 2021 and 2022 is presented in Table 1.7. OFLO observations were recorded during the periods 30 June to 18 September 2021 and 01 April to 10 July 2022 and MarineSpace undertook fisheries monitoring fisheries observations until 30 November 2022. Data is not fully representative of fishing activity in the commercial fisheries study area, particularly inside the 12 nm boundary, where survey vessels were not present. This data has been interpreted with care due to the low-medium confidence assigned, as discussed in section 1.3.1.
- 1.4.9.15 Figure 1.66 displays all the observations recorded by the OFLO and MarineSpace, however it is important to note that not all vessels were observed within the commercial fisheries study area or within the Morgan Array Area. Table 1.7 outlines the fishing vessels which were identified within the commercial fisheries study area, and notes which vessels were identified within the Morgan Array Area.

Table 1.7: Summary of fishing vessels identified by the OFLO and MarineSpace during offshore surveys.

Length (m)	Vessel type	Nationality	Commercial fisheries study area	Morgan Array Area
No information	Scallop vessel (dredge)	UK	Y	N
No information	Otter trawler	UK	Y	N
No information	Scallop vessel (dredge)	UK	Y	Y
No information	Trawler	UK	Y	N
No information	Otter trawler	France	Y	N
No information	Scallop vessel (dredge)	UK	Y	N
10	Static gear vessel	UK	Y	N
10	Otter trawler	Isle of Man	Y	N
11.6	Unknown	UK	Y	N
11.95	Otter trawler	UK	Y	N
11.99	Scallop vessel (dredge)	UK	Y	N
12	Static gear vessel	UK	Y	Y
13.09	Otter trawler	UK	Y	N
13.2	Static gear vessel	UK	Y	Y
13.39	Static gear vessel	UK	Y	Y
13.4	Trawler	UK	Y	N
13.97	Scallop vessel (dredge)	UK	Y	N
14	Otter trawler	Isle of Man	Y	Y

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Length (m)	Vessel type	Nationality	Commercial fisheries study area	Morgan Array Area
14	Trawler	Isle of Man	Y	N
14	Otter trawler	Isle of Man	Y	N
14.11	Otter trawler	UK	Y	N
14.5	Otter trawler	UK	Y	N
14.73	Scallop vessel (dredge)	UK	Y	Y
14.95	Otter trawler	UK	Y	N
14.96	Scallop vessel (dredge)	UK	Y	Y
14.98	Otter trawler	UK	Y	N
15	Scallop vessel (dredge)	UK	Y	N
15	Scallop vessel (dredge)	UK	Y	N
15.7	Otter trawler	UK	Y	N
16	Otter trawler	UK	Y	N
16	Scallop vessel (dredge)	UK	Y	Y
16	Scallop vessel (dredge)	Isle of Man	Y	N
16.4	Static gear vessel	UK	Y	Y
16.77	Scallop vessel (dredge)	UK	Y	N
16.89	Otter trawler	UK	Y	N
17	Otter trawler	UK	Y	N
17.13	Static gear vessel	UK	Y	Y
17.13	Static gear vessel	UK	Y	N
17.6	Otter trawler	UK	Y	N
17.99	Trawler	UK	Y	N
18	Otter trawler	UK	Y	N
18.5	Otter trawler	UK	Y	N
19	Otter trawler	UK	Y	N
19.27	Trawler	Canada	Y	N
19.35	Trawler	UK	Y	N
19.9	Otter trawler	UK	Y	N
20	Scallop vessel (dredge)	UK	Y	N
20.5	Otter trawler	UK	Y	N
20.6	Trawler	UK	Y	N
20.86	Otter trawler	UK	Y	N
21	Otter trawler	UK	Y	N
22.4	Trawler	UK	Y	N

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Length (m)	Vessel type	Nationality	Commercial fisheries study area	Morgan Array Area
22.78	Trawler	UK	Y	N
22.8	Otter trawler	UK	Y	N
22.94	Scallop vessel (dredge)	UK	Y	Y
23.09	Otter trawler	UK	Y	N
23.6	Otter trawler	UK	Y	N
29.86	Beam trawler	UK	Y	N
34	Beam trawler	Belgium	Y	Y
34.1	Trawler	UK	Y	Y
37	Beam trawler	Belgium	Y	N
37	Beam trawler	Belgium	Y	N
38	Beam trawler	Belgium	Y	Y
38	Beam trawler	Belgium	Y	N
38.9	Beam trawler	Belgium	Y	N
40	Beam trawler	Belgium	Y	N
43.51	Trawler	UK	Y	N

- 1.4.9.16 During the offshore surveys a total of 67 fishing vessels were observed by the OFLO and MarineSpace within the commercial fisheries study area, 14 of which were observed within the Morgan Array Area. The majority of vessels observed within the commercial fisheries study area were from the UK, with vessels also from Belgium, Canada, France and the Isle of Man. Offshore static gear vessels showed the largest spatial extent, with activity across the commercial fisheries study area. Scallop vessels were active across the commercial fisheries study area. The high density of points inside the 12 nm and within ICES rectangle 37E6 clearly shows the Nephrops fishing grounds. Relatively high densities of beam trawl vessels were observed southeast of the Morgan Array Area, beyond the 12 nm.
- 1.4.9.17 Within the Morgan Array Area, the only non-UK vessels observed were from Belgium and the Isle of Man. However, it is unclear whether these vessels were actively fishing, or transiting through the area. This generally aligns with the information presented in section 1.4.3 and with feedback from consultation. Four scallop dredge vessels and five static gear vessels were recorded within the Morgan Array Area. There was a cluster of static gear points in the east part of the Morgan Array Area.
- 1.4.9.18 Static gear (crab and whelk pots) was also recorded and observed within the Morgan Array Area, but the exact locations of this gear are not shown here due to commercial sensitivities.
- 1.4.9.19 Figure 1.66 indicates that fishing vessels may transit through the Morgan Array Area, for example between Fleetwood and fishing grounds within the wider Irish Sea region.
- 1.4.9.20 Few scallop vessels were observed by the OFLO during the 2021 and 2022 offshore surveys. This is likely due to the surveys overlapping with the seasonal closures for both queen and king scallop in the Irish Sea and vessels working in other areas to

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

avoid interactions with the survey vessels; this has been considered when interpreting the data. Some scallop vessels were also observed transiting towards the fishing grounds within the Morgan Array Area but turning AIS off once they started fishing.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

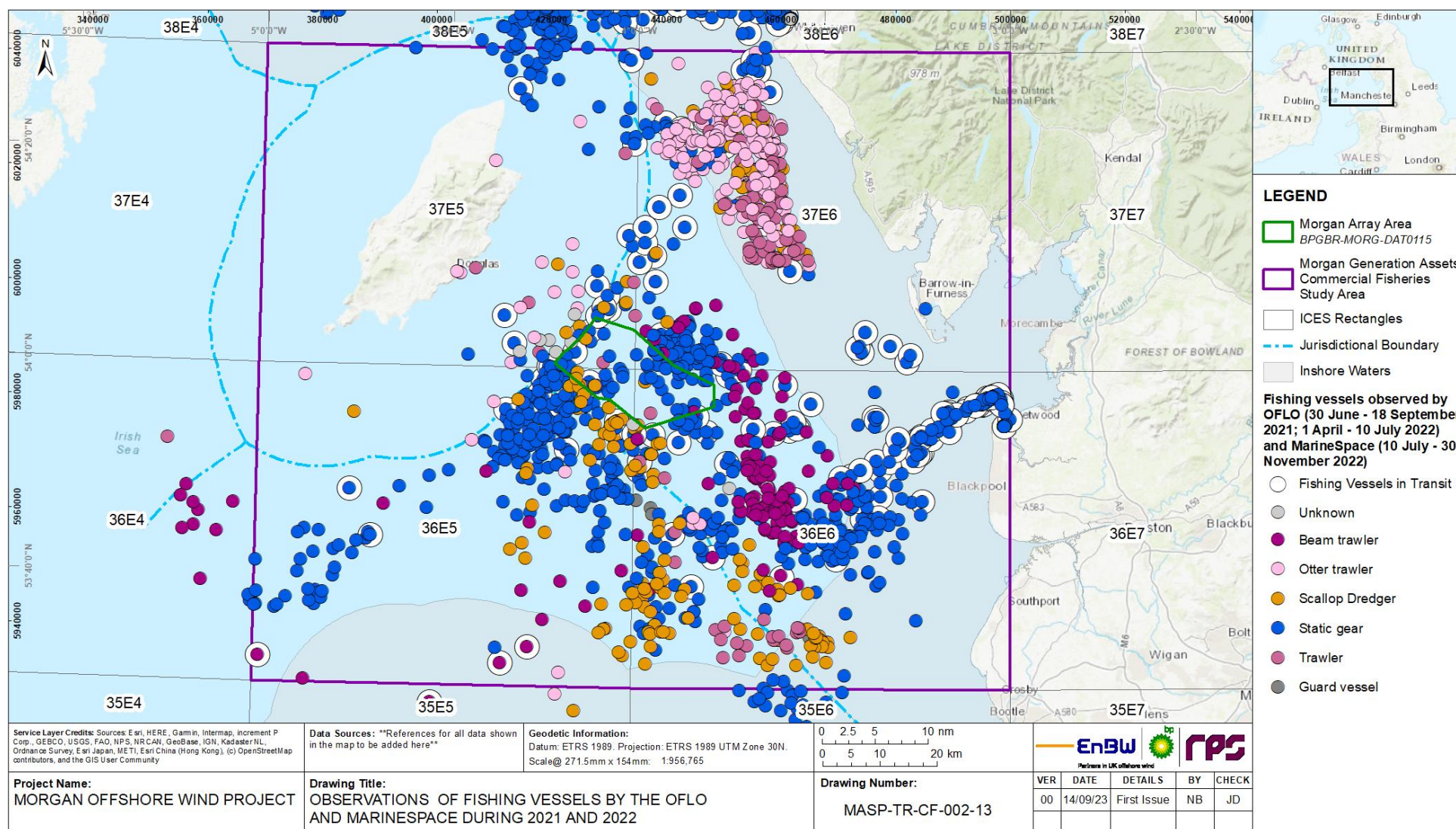


Figure 1.66: Observations of fishing vessels by the OFLO (30 June to 18 September 2021 and 01 April to 10 July 2022) and MarineSpace (10 July to 30 November 2022).

1.5 Future baseline

- 1.5.1.1 The baseline environment for commercial fisheries is constantly evolving, as the fishing industry is dynamic, with frequent and sometime unpredictable changes which affect activity, such as changes in fish abundance and distribution, climatic conditions, management regulations and fuel costs (DECC, 2016). A review by the Irish Sea Maritime Forum highlighted that legislative and policy changes from ‘Brexit’, overfishing and spatial conflict are considered key future issues for the fishing industry (Salthouse, 2021).
- 1.5.1.2 The baseline was described using the most recent datasets available over at least a four-year time period and, where possible, using a 10-year time period. This should account for variations within the different fisheries, for example the scallop fishery within the commercial fisheries study area is cyclical over seven to eight year periods, as established in consultation with commercial fisheries stakeholders. Feedback from project specific consultation indicated that reduced levels of queen scallop were observed between 2017 to 2020, so the next few years are expected to see higher catches and, therefore, a higher level of activity. The future baseline scenario is expected to reflect the cyclical nature of the fisheries which is observed in the datasets analysed.
- 1.5.1.3 Within the commercial fisheries study area, the impacts of ‘Brexit’ on the commercial fisheries baseline are uncertain. Fisheries within UK waters were managed through the EU CFP prior to the withdrawal of the UK in 2021. Under the new EU-UK Trade and Cooperation Agreement there is a five-year transition period, whereby 25% of the EU quota for British waters will be transferred to the UK fishing fleet, phased across the five years until 2025. As a result, the UK will receive higher quota shares for some stocks, as outlined in Table 1.8 for species within the Irish Sea. However, a large proportion of landings within the commercial fisheries study area are from non-quota shellfish species, so will not be affected by the quota changes. Quota allocations for 2026 and beyond are likely to be the same as for 2025 and access to EU/UK waters will be subject to annual negotiations. The introduction of the Catch Certificate and other supporting documents, as well as changes to tariffs could act as a barrier to the UK fishing fleet exporting landings to the EU.

Table 1.8: Quota share changes by 2026 for the UK, for species within the Irish Sea⁶⁷.

Stock	2020 UK share of EU quota	2026 UK share of EU/UK quota or TAC	UK quota absolute increase
Herring	73.97%	99.01%	25%
Plaice	41.15%	51.11%	10%
Haddock	47.91%	56.02%	8%
Whiting	38.70%	61.00%	22%
Cod	28.79%	44.80%	16%
Sole	21.01%	23.30%	2%

⁶⁷ ABPmer 2021

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

- 1.5.1.4 New herring quota for the Isle of Man was introduced in July 2023. Fishing businesses may be able to diversify, rather than relying on king and queen scallop which are seasonal fisheries.
- 1.5.1.5 Irish and Belgian vessels are the main non-UK vessels that are active within the commercial fisheries study area. At present, it is not clear how their activity will change post 2026, as they predominantly catch species which are subject to quota allocations. Inshore UK vessels in the commercial fisheries study area generally target non-quota shellfish species, but they could be affected by potential tariff and non-tariff barriers if exporting to the EU.
- 1.5.1.6 Other pressures on the fishing industry, such as rising fuel costs or potential designations of marine protected areas could affect the commercial fisheries baseline. The impact of the Covid-19 pandemic may not yet be seen in the official datasets, but there could be changes within the fishing industry due to adapting to, and recovering from, the pandemic.
- 1.5.1.7 Cumulative impacts on commercial fisheries, including those from proposed offshore developments, are considered in Volume 2, Chapter 6: Commercial fisheries of the Environmental Statement.

1.6 Summary

- 1.6.1.1 A description of baseline fishing activity in the region of the Morgan Array Area has been undertaken via a review of official landings and fishing activity data, feedback from fisheries stakeholders and site-specific surveys.
- 1.6.1.2 Within the commercial fisheries study area, the key commercial fishing fleets identified were:
- Dredging and trawling for king scallop and queen scallop
 - Potting for whelk, crab and lobster
 - Beam trawling for flatfish and other demersal finfish
 - Trawling for herring
 - Trawling for *Nephrops*.
- 1.6.1.3 Shellfish account for the largest proportion of landings in the commercial fisheries study area and dredges dominant UK and Isle of Man vessel landings, whereas beam trawl and dredge vessels dominated non-UK vessel landings. This reflects the importance of the king scallop, queen scallop and whelk fisheries in this region, particularly within the west parts of the Morgan Array Area.
- 1.6.1.4 Whereas the king scallop grounds are relatively extensive, the queen scallop grounds within the far west part of the Morgan Array Area are much more discrete and are heavily relied on by both UK and non-UK fleets. The scallop fisheries are seasonal due to existing closures in the Irish Sea.
- 1.6.1.5 The whelk fishery within the commercial fisheries study area, including the Morgan Array Area, comprises a range of vessel sizes; there are several UK commercial fisheries operators which are able to operate all year round.
- 1.6.1.6 Beam trawling for flatfish is undertaken predominantly by several vessels from Belgium and the southwest of England. These vessels are generally active in the commercial fisheries study area during the spring, and overlap with the east part of the Morgan Array Area.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

- 1.6.1.7 Trawling and netting for herring is mostly undertaken by several vessels from Northern Ireland and England; this fishery is very seasonal and occurs mainly during June and July.
- 1.6.1.8 Trawling for Nephrops within the commercial fisheries study area mostly occurs off the Cumbrian coast during the summer months but does not generally overlap with the Morgan Array Area.
- 1.6.1.9 Within the commercial fisheries study area, fishing activity occurs at lower levels around the coast and activity is generally from static gear vessels. Within the Morgan Array Area, there are several smaller static gear vessels that are active, which operate out of Fleetwood.
- 1.6.1.10 A full impact assessment of commercial fisheries receptors has been undertaken and presented in Volume 2, Chapter 6: Commercial fisheries of the Environmental Statement.

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