

# MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Preliminary Environmental Information Report

Volume 2, chapter 11: Commercial fisheries



April 2023  
FINAL

Image of an offshore wind farm

**Document status**

<b>Version</b>	<b>Purpose of document</b>	<b>Authored by</b>	<b>Reviewed by</b>	<b>Approved by</b>	<b>Review date</b>
Rev01	Draft for Client review	MarineSpace	RPS		08/12/2022
Rev02	Addressing client comments	MarineSpace	RPS		19/01/2023
Rev03	Final	MarineSpace	RPS	bp/EnBW	03/02/2023

The report has been prepared for the exclusive use and benefit of our client and solely for the purpose for which it is provided. Unless otherwise agreed in writing by RPS Group Plc, any of its subsidiaries, or a related entity (collectively 'RPS') no part of this report should be reproduced, distributed or communicated to any third party. RPS does not accept any liability if this report is used for an alternative purpose from which it is intended, nor to any third party in respect of this report. The report does not account for any changes relating to the subject matter of the report, or any legislative or regulatory changes that have occurred since the report was produced and that may affect the report.

The report has been prepared using the information provided to RPS by its client, or others on behalf of its client. To the fullest extent permitted by law, RPS shall not be liable for any loss or damage suffered by the client arising from fraud, misrepresentation, withholding of information material relevant to the report or required by RPS, or other default relating to such information, whether on the client's part or that of the other information sources, unless such fraud, misrepresentation, withholding or such other default is evident to RPS without further enquiry. It is expressly stated that no independent verification of any documents or information supplied by the client or others on behalf of the client has been made. The report shall be used for general information only.

**Prepared by:**

**RPS**

**Prepared for:**

**Morgan Offshore Wind Ltd.**

## Contents

<b>11</b>	<b>CHAPTER 11 – COMMERCIAL FISHERIES</b>	<b>1</b>
11.1	Introduction	1
11.1.1	Overview	1
11.1.2	Purpose of chapter	1
11.1.3	Study area	1
11.2	Policy context	3
11.2.1	National Policy Statements	3
11.2.2	North West Inshore and North West Offshore Coast Marine Plans	4
11.3	Consultation	4
11.4	Baseline environment	9
11.4.1	Methodology to inform baseline	9
11.4.2	Desktop study	9
11.4.3	Site-specific surveys	9
11.4.4	Baseline environment	10
11.4.5	Receptor groups	13
11.4.6	Future baseline scenario	14
11.4.7	Data limitations	14
11.5	Impact assessment methodology	15
11.5.1	Overview	15
11.5.2	Impact assessment criteria	15
11.6	Key parameters for assessment	16
11.6.1	Maximum design scenario	16
11.6.2	Impacts scoped out of the assessment	20
11.7	Measures adopted as part of the Morgan Generation Assets	20
11.8	Assessment of significant effects	21
11.8.2	Loss or restricted access to fishing grounds	21
11.8.3	Displacement of fishing activity into other areas	27
11.8.4	Interference with fishing activity	33
11.8.5	Temporary increase in steaming distances	35
11.8.6	Loss or damage to fishing gear due to snagging	36
11.8.7	Potential impacts on commercially important fish and shellfish resources	39
11.8.8	Supply chain opportunities for local fishing vessels	40
11.8.9	Potential impacts on commercial fisheries as a result of increased risk of introduction and spread of INNS	42
11.8.10	Future monitoring	42
11.9	Cumulative effect assessment methodology	42
11.9.1	Methodology	42
11.9.2	Maximum design scenario	46
11.10	Cumulative effects assessment	48
11.10.2	Loss or restricted access to fishing grounds	48
11.10.3	Interference with fishing activity	49
11.10.4	Loss or damage of fishing gear due to snagging	50
11.10.5	Potential impacts on commercially important fish and shellfish resources	51
11.10.6	Future monitoring	51
11.11	Transboundary effects	51
11.12	Inter-related effects	52
11.13	Summary of impacts, mitigation measures and monitoring	52
11.14	Next steps	60
11.15	References	60

## Tables

Table 11.1:	Summary of the NPS EN-3 provisions relevant to commercial fisheries	3
Table 11.2:	Summary of NPS EN-3 policy on decision making relevant to commercial fisheries	3
Table 11.3:	North West Inshore and North West Offshore Marine Plan policies of relevance to commercial fisheries	4
Table 11.4:	Summary of key consultation issues relevant to commercial fisheries raised during consultation activities undertaken for the Morgan Generation Assets	6
Table 11.5:	Summary of key desktop data sources/reports	9
Table 11.6:	Summary of site-specific survey data	10
Table 11.7:	Key commercial fisheries receptor groups used in this assessment	13
Table 11.8:	Quota share changes by 2026 for the UK, for species within the Irish Sea	14
Table 11.9:	Definition of terms relating to magnitude of impact	15
Table 11.10:	Definition of terms relating to sensitivity of the receptor	15
Table 11.11:	Matrix used for the assessment of the significance of effect	16
Table 11.12:	MDS considered for the assessment of potential impacts on commercial fisheries	17
Table 11.13:	Impacts scoped out of the assessment for commercial fisheries	20
Table 11.14:	Measures adopted as part of the Morgan Generation Assets	20
Table 11.15:	Magnitude, sensitivity and impact significance relating to loss or restricted access to fishing grounds during construction of the Morgan Generation Assets	24
Table 11.16:	Magnitude, sensitivity and impact significance relating to loss or restricted access to fishing grounds during the operations and maintenance phase of the Morgan Generation Assets	27
Table 11.17:	Magnitude, sensitivity and impact significance relating to loss or restricted access to fishing grounds during decommissioning of the Morgan Generation Assets	27
Table 11.18:	Magnitude, sensitivity and impact significance relating to displacement of fishing activity into other areas during construction of the Morgan Generation Assets	30
Table 11.19:	Magnitude, sensitivity and impact significance relating to displacement of fishing activity into other areas during the operations and maintenance phase of the Morgan Generation Assets	32
Table 11.20:	Magnitude, sensitivity and impact significance relating to displacement of fishing activity into other areas during decommissioning of the Morgan Generation Assets	32
Table 11.21:	Magnitude, sensitivity and impact significance relating to interference with fishing activity during construction of the Morgan Generation Assets	34
Table 11.22:	Magnitude, sensitivity and impact significance relating to interference with fishing activity during the operations and maintenance phase of the Morgan Generation Assets	34
Table 11.23:	Magnitude, sensitivity and impact significance relating interference with fishing activity during decommissioning of the Morgan Generation Assets	35
Table 11.24:	Magnitude, sensitivity and impact significance relating to temporary increase in steaming distances during construction of the Morgan Generation Assets	35
Table 11.25:	Magnitude, sensitivity and impact significance relating to temporary increase in steaming distances during decommissioning of the Morgan Generation Assets	36
Table 11.26:	Magnitude, sensitivity and impact significance relating to loss or damage to fishing gear due to snagging during construction of the Morgan Generation Assets	38
Table 11.27:	Magnitude, sensitivity and impact significance relating to loss or damage to fishing gear due to snagging during the operations and maintenance phase of the Morgan Generation Assets	39
Table 11.28:	Magnitude, sensitivity and impact significance relating to loss or damage to fishing gear due to snagging during decommissioning of the Morgan Generation Assets	39
Table 11.29:	Magnitude, sensitivity and impact significance relating to supply chain opportunities for local fishing vessels during construction of the Morgan Generation Assets	41
Table 11.30:	Magnitude, sensitivity and impact significance relating to supply chain opportunities for local fishing vessels during the operations and maintenance phase of the Morgan Generation Assets	42
Table 11.31:	Monitoring commitments	42

**MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS**

Table 11.32: List of other projects, plans and activities considered within the CEA.....44  
 Table 11.33: MDS considered for the assessment of potential cumulative effects on commercial fisheries. .47  
 Table 11.34: Magnitude, sensitivity and impact significance relating to loss or restricted access to fishing grounds during construction of the Morgan Generation Assets.....48  
 Table 11.35: Magnitude, sensitivity and impact significance relating to loss or restricted access to fishing grounds during the operations and maintenance phase of the Morgan Generation Assets. ....49  
 Table 11.36: Magnitude, sensitivity and impact significance relating to interference with fishing activity during construction of the Morgan Generation Assets.....50  
 Table 11.37: Magnitude, sensitivity and impact significance relating to interference with fishing activity during the operations and maintenance phase of the Morgan Generation Assets. ....50  
 Table 11.38: Magnitude, sensitivity and impact significance relating to loss or damage of fishing gear due to snagging during construction of the Morgan Generation Assets.....50  
 Table 11.39: Magnitude, sensitivity and impact significance relating to loss or damage of fishing gear due to snagging during the operations and maintenance phase of the Morgan Generation Assets.....51  
 Table 11.40: Monitoring commitments.....51  
 Table 11.41: Summary of potential environmental effects, mitigation and monitoring. ....53  
 Table 11.42: Summary of potential cumulative environmental effects, mitigation and monitoring.....59

**Figures**

Figure 11.1: Commercial fisheries study area.....2  
 Figure 11.2: Sum of landed value (2010 to 2020) within the commercial fisheries study area, displayed by species group and vessel class (UK vessels).....11  
 Figure 11.3: Sum of landed weight (2010 to 2020) within the commercial fisheries study area, displayed by species group and vessel class (UK vessels).....11  
 Figure 11.4: Sum of landed weight by vessel size class (2006-2016) within the commercial fisheries study area) (non-UK vessels). ....11  
 Figure 11.5: Seasonal trends in top five species by total landed weight (tonnes) from UK vessels across the commercial fisheries study area (2010 to 2020). ....12  
 Figure 11.6: Annual trends in top five species by total landed weight (tonnes) from UK vessels across the commercial fisheries study area (2010 to 2020). ....12  
 Figure 11.7: Other projects, plans and activities screened into the cumulative effects assessment.....45

**List of Annexes**

- Annex 5.3: CEA screening matrix of the PEIR.
- Annex 5.4: Transboundary screening of the PEIR.
- Annex 11.1: Commercial fisheries technical report of the PEIR.
- Annex 12.1: Navigational Risk Assessment of the PEIR.

## Glossary

Term	Meaning
Beam trawler	A vessel undertaking beam trawling, which is a fishing method of bottom trawling with a net that is held open by a solid metal beam, attached to two "shoes", consisting of solid metal plates, fixed to the ends of the beam.
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 fish	Demersal fish are species that live and feed on or near the seabed.
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 Offshore Fisheries Liaison Officer (OFLO) and disseminator of Project information.
Fishing ground	An area of water or seabed targeted by fishing activity.
Fleet	A physical group of vessels sharing similar characteristics (e.g. nationality).
Gear type	The method/equipment used for fishing.
ICES statistical rectangles	Defined areas of sea used for fisheries statistics (1 degree longitude by 0.5 degree latitude, equalling approximately 30 by 30 nautical miles).
Inshore waters (England and Wales)	Mean High Water Springs (MHWS) to 12 nautical miles (nm) offshore.
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 licence required and, therefore, allowable catch, discards and quotas.
Landings	Quantitative description of amount of fish returned to port for sale, in terms of value or weight.
Notice to Mariners	The United Kingdom Hydrographic Office's (UKHO) service of publications that contain all of the corrections, alterations and amendments to the UKHO worldwide charts and publications. These are published weekly and are available directly from the UKHO.
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 fish	Pelagic fish are species which live and feed within the water column.
Pelagic trawl	Pelagic trawls consist of nets which are used to catch fish in the water column, rather than on the seafloor.

Term	Meaning
Potter	A vessel undertaking potting, which is a method of fishing that uses pots (or creels) which are baited traps set down on the seabed to catch crabs and lobsters.
Safety zone	This includes defined safety zones (in accordance with the Maritime and Coastguard Agency) and advisory safety zones (recommended during construction and/or maintenance works).
Scallop dredger	A vessel undertaking scallop dredging, which is a fishing method to catch scallop using steel dredges with a leading bar fitted with a set of spring loaded, downward pointing teeth. Behind this toothed bar (sword), a mat of steel rings is fitted. A heavy net cover (back) is laced to the frame, sides and after end of the mat to form a bag.
Shellfish	For the purposes of this assessment, shellfish is considered a generic term to define molluscs and crustaceans.
Static gear	Gear that is set to catch fish or shellfish. This is a collective term and includes gears that remains static and is not towed, such as pots, traps and set nets.
Vessel Monitoring System	Satellite tracking system using a device on vessel which transmits the location, speed and course of the vessel.

## Acronyms

Acronym	Description
AIS	Automatic Identification System
ANIFPO	Anglo-North Irish Fish Producers Organisation
BEIS	Department for Business, Energy and Industrial Strategy
CFLO	Company Fisheries Liaison Officer
CEA	Cumulative Effect Assessment
COLREGS	The Convention on the International Regulations for Preventing Collisions at Sea 1972
DECC	Department of Energy and Climate Change (now BEIS)
dML	deemed Marine Licence
DPR	Daily Progress Report
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
EU	European Union
EU STECF	European Union Scientific, Technical and Economic Committee for Fisheries
FIR	Fishing Industry Representative
HND	Holistic Network Design
ICES	International Council for the Exploration of the Sea
IFCA	Inshore Fisheries and Conservation Authority

**MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS**

Acronym	Description
ISEFPO	Irish South & East Fish Producers Organisation
LTMP	Long Term Management Plan
MCA	Maritime and Coastguard Agency
MCZ	Marine Conservation Zone
MDS	Maximum Design Scenario
MFPO	Manx Fish Producers Organisation
MHWS	Mean High Water Spring
MMO	Marine Management Organisation
MPA	Marine Protected Area
NFFO	National Federation of Fishermen's Organisations
NIFPO	Northern Ireland Fish Producers Organisation
OFLO	Offshore Fisheries Liaison Officer
PEIR	Preliminary Environmental Information Report
SAC	Special Area of Conservation
SFF	Scottish Fishermen's Federation
SSC	Suspended Sediment Concentrations
SWFPA	The Scottish White Fish Producers Association Ltd
UK	United Kingdom
UKHO	United Kingdom Hydrographic Office
VMS	Vessel Monitoring System
WCSP	West Coast Sea Products Ltd
WFA	Welsh Fisherman's Association
WFC	Whitehaven Fisherman's Cooperative
WFPO	Western Fish Producers Organisation

**Units**

Unit	Description
£	Pound sterling
kW	Kilowatt (power)
kWh	Kilowatt hours
m	Metres
nm	Nautical mile (distance; 1nm = 1.852km)
t	Tonnes

## 11 Chapter 11 – Commercial fisheries

### 11.1 Introduction

#### 11.1.1 Overview

11.1.1.1 This chapter of the Preliminary Environmental Information Report (PEIR) presents the assessment of potential impacts of the Morgan Offshore Wind Project Generation Assets, hereafter referred to as the Morgan Generation Assets, on commercial fisheries. Specifically, this chapter considered the potential impact of the Morgan Generation Assets seaward of Mean High Water Springs (MHWS) during the construction, operation and maintenance, and decommissioning phases. In instances within this chapter where the Morgan Generation Assets is referred to spatially, the “Morgan Array Area” will be used.

11.1.1.2 The assessment presented is informed by the following technical chapters:

- Volume 2, chapter 7: Benthic subtidal and intertidal ecology of the PEIR
- Volume 2, chapter 8: Fish and shellfish ecology of the PEIR
- Volume 2, chapter 12: Shipping and navigation of the PEIR
- Volume 2, chapter 14: Other sea users of the PEIR.

11.1.1.3 This chapter also draws upon information contained within volume 6, annex 11.1: Commercial fisheries technical report of the PEIR.

11.1.1.4 For the purposes of this chapter, commercial fishing is defined as any form of fishing activity where the catch is sold for taxable profit. Recreational rod and line fishers, as well as charter-angling operators, are also active in the region. The potential impacts of the Morgan Generation Assets on recreational rod and line fisheries are considered within the other sea users chapter in volume 2, chapter 14: Other sea users of the PEIR. The approach for considering potential impacts of the Morgan Generation Assets on commercial operators is set out within volume 2, chapter 18: Socio-economics of the PEIR.

#### 11.1.2 Purpose of chapter

11.1.2.1 The primary purpose of the PEIR is outlined in volume 1, chapter 1: Introduction of the PEIR. In summary, the primary purpose of a final Environmental Statement is to support the Development Consent Order (DCO) application for the Morgan Generation Assets under the Planning Act 2008 (the 2008 Act). The PEIR constitutes the Preliminary Environmental Information for the Morgan Generation Assets and sets out the findings of the EIA to date to support the pre-application consultation activities required under the 2008 Act. The EIA will be finalised following completion of pre-application consultation and the Environmental Statement will accompany the application to the Secretary of State for Development Consent.

11.1.2.2 The PEIR forms the basis for statutory consultation, which will last for 47 days and conclude on 4 June 2023. At this point, comments received on the PEIR will be reviewed and incorporated (where appropriate) into the Environmental Statement, which will be submitted in support of the application for Development Consent, scheduled for quarter one of 2024.

11.1.2.3 Specifically, this PEIR chapter:

- Presents the existing environmental baseline established from desk studies, site-specific surveys and consultation with key commercial fisheries stakeholders
- Identifies any assumptions and limitations encountered in compiling the environmental baseline information
- Presents the potential environmental effects of the Morgan Generation Assets on commercial fisheries, based on the information gathered and the analysis and assessments undertaken as part of the EIA process undertaken to date
- Highlights any necessary monitoring and/or mitigation measures which could prevent, minimise, reduce or offset the possible environmental effects of the Morgan Generation Assets on commercial fisheries.

#### 11.1.3 Study area

11.1.3.1 The Morgan Generation Assets (the Morgan Array Area) 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 (illustrated in Figure 11.1) will be located within ICES Rectangle 36E5, 36E6, 37E5 and 37E6; and is wholly within English waters.

11.1.3.2 A broad commercial fisheries study area has been defined for the purposes of this PEIR chapter, to provide a wider regional context to the current fisheries activity, and to ensure that potential impacts (e.g. displacement of fishing vessels) from the Morgan Generation Assets on commercial fisheries are fully assessed. Therefore, for the purposes of this PEIR chapter, the commercial fisheries study area is defined as ICES Rectangles 36E5, 36E6, 37E5 and 37E6.

11.1.3.3 Given the operational ranges of the fishing fleets active in the region, and considering feedback from consultation, the study area for the Cumulative Effects Assessment (CEA) for commercial fisheries remains the same as for the main assessment (ICES Rectangles 36E5, 36E6, 37E5 and 37E6). This study area will ensure that relevant regional fishing grounds, for a range of different fishing fleets, are fully assessed as part of the CEA.

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

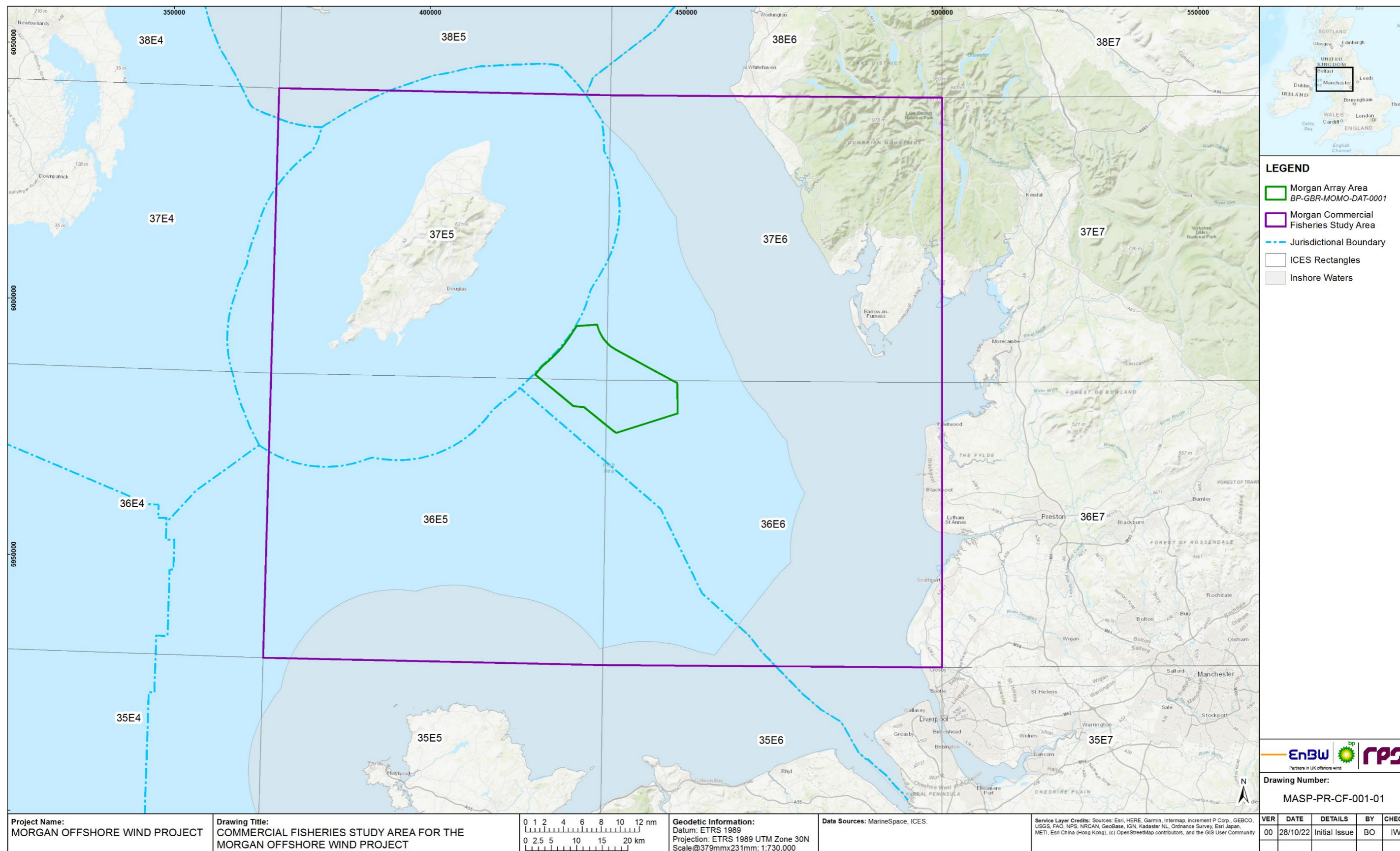


Figure 11.1: Commercial fisheries study area.



**11.2 Policy context**

**11.2.1 National Policy Statements**

- 11.2.1.1 Planning policy on renewable energy infrastructure is presented in volume 1, chapter 2: Policy and legislation of the PEIR. Planning policy relevant to offshore renewable energy Nationally Significant Infrastructure Projects (NSIPs), is contained in the Overarching National Policy Statement (NPS) for Renewable Energy Infrastructure (EN-3, DECC, 2011b). EN-3 includes specific policy statements for commercial fisheries. A review of the Overarching NPS for Energy (EN-1; DECC, 2011a) has been undertaken and there are no specific references to commercial fisheries within this document.
- 11.2.1.2 NPS EN-3 includes guidance on those matters that are to be considered in any assessment of an offshore renewable energy project. These are summarised in Table 11.1 below. NPS EN-3 also highlights a number of factors relating to the determination of an application and in relation to mitigation. These are summarised in Table 11.2 below.
- 11.2.1.3 Table 11.1 refers to the current NPSs, specifically NPS EN-1 (DECC, 2011a) and NPS EN-3 (DECC, 2011b). If the NPSs are updated prior to the application for Development Consent, the revised NPSs will be fully considered in relation to commercial fisheries within the Environmental Statement.

**Table 11.1: Summary of the NPS EN-3 provisions relevant to commercial fisheries.**

NPS EN-3 provision	How and where considered in the PEIR
The construction and operation of offshore windfarms can have both positive and negative effects on fish and shellfish stocks (paragraph 2.6.122 of NPS EN-3).	Potential impacts to fish stocks arising from the Morgan Generation Assets have been assessed in volume 2, chapter 8: Fish and shellfish ecology of the PEIR. Potential impacts on the commercial fisheries that target the fish stocks are assessed in section 11.8.6.4.
Whilst the footprint of the offshore windfarm and any associated infrastructure may be a hindrance to certain types of commercial fishing activity, such as trawling and longlining, other fishing activities may be able to take place within operational windfarms without unduly disrupting or compromising navigational safety. Consequently, the establishment of a windfarm can increase the potential for some activities, such as potting, where this would not compromise any safety zone in place. The Planning Inspectorate should consider adverse or beneficial impacts on different types of commercial fishing on a case-by-case basis (paragraph 2.6.123 of NPS EN-3).	Potential impacts to commercial fisheries have been described in section 11.8, and cumulative effects are described in section 11.9.
In some circumstances, transboundary issues may be a consideration as fishermen from other countries may fish in waters within which offshore windfarms are sited (paragraph 2.6.124 of NPS EN-3).	Transboundary issues have been described in section 11.11, where consideration has been given to both UK and non-UK fishing fleets.

NPS EN-3 provision	How and where considered in the PEIR
--------------------	--------------------------------------

Early consultation should be undertaken with statutory advisors and with representatives of the fishing industry which could include discussions of impact assessment methodologies (paragraph 2.6.127 of NPS EN-3).	Consultation with relevant stakeholders (local, regional, national and international) has been undertaken for the Morgan Generation Assets and is summarised in section 11.3, with further information in volume 6, annex 11.1: Commercial fisheries technical report of the PEIR and the Consultation Report which will be submitted as part of the DCO application.
Where a number of offshore wind farms have been proposed within an identified zone, it may be beneficial to undertake such consultation at a zonal, rather than a site-specific, level (paragraph 2.6.128 of NPS EN-3).	Cumulative impacts have been assessed in section 11.10. Consultation has taken place with a wide range of local, regional, UK and non-UK fisheries stakeholders active in the wider region, not only within and around the Morgan Generation Assets.
The assessment by the applicant should include detailed surveys of the effects on fish stocks of commercial interest and any potential reduction in such stocks, as well as any likely constraints on fishing activity within the project's boundaries. Robust baseline data should have been collected and studies conducted as part of the assessment (paragraph 2.6.129 of NPS EN-3).	Volume 2, chapter 8: Fish and shellfish ecology of the PEIR outlines the potential impacts on fish stocks, including those of commercial interest. Baseline fisheries activity data has been collated from official sources and through consultation, as described in section 11.6 and volume 6, annex 11.1: Commercial fisheries technical report of the PEIR. Likely constraints associated with the Morgan Generation Assets are assessed in section 11.6.
Where there is a possibility that safety zones will be sought around offshore infrastructure, potential effects should be included in the assessment on commercial fishing (paragraph 2.6.130 of NPS EN-3).	Implications from the implementation of safety zones have been presented in section 11.8. There will be temporary 500m safety zones around the major construction vessels and any future major operations and maintenance vessel activities. Safety Zones are included within the PDE and have been considered within volume 2, chapter 12: Shipping and navigation and volume 6, annex 12.1: Navigational risk assessment of the PEIR.
Where the precise extents of potential safety zones are unknown, a realistic worst case scenario should be assessed. Applicants should consult the Maritime and Coastguard Agency (MCA). Exclusion of certain types of fishing may make an area more productive for other types of fishing. The assessment by the Applicant should include surveys of the effects on fish stocks of commercial interest and the potential reduction or increase in such stocks will result from the presence of the windfarm development and of any safety zones (paragraph 2.6.131 of NPS EN-3).	

**Table 11.2: Summary of NPS EN-3 policy on decision making relevant to commercial fisheries.**

NPS EN-3 provision	How and where considered in the PEIR
The Secretary of State should be satisfied that the site selection process has been undertaken in a way that reasonably minimises adverse effects on fish stocks, including during peak spawning periods and the activity of fishing itself (paragraph 2.6.132 of NPS EN-3).	The potential impacts arising from the Morgan Generation Assets will be discussed with statutory bodies during consultation. The Applicant is taking, and will continue to take, steps to minimise the effects upon the industry in the area through appropriate mitigation, where required (see section 11.7).

NPS EN-3 provision	How and where considered in the PEIR
The Secretary of State should consider the extent to which the proposed development occupies any recognised important fishing grounds and whether the project would prevent or significantly impede protection of sustainable Commercial Fisheries or fishing activities (paragraph 2.6.132 of NPS EN-3).	The Applicant has considered the extent to which the Morgan Generation Assets will overlap with recognised fishing grounds and has carried out consultation with fishing stakeholders, in order to fully understand any potential impacts (see section 11.3). The results of this assessment are presented in this chapter (see section 11.8).
The Secretary of State should be satisfied that the Applicant has sought to design the proposal having consulted representatives of the fishing industry with the intention of minimising the loss of fishing opportunity taking into account effects on other marine interests (paragraph 2.6.133 of NPS EN-3).	The Applicant has committed to a consultation programme with commercial fisheries stakeholders to ensure that the project design can, where possible, promote co-existence (see section 11.3).
Any mitigation proposals should result from the Applicant having detailed consultation with relevant representatives of the fishing industry (paragraph 2.6.134 of NPS EN-3).	Consultation is an important aspect of the assessment of potential impacts on commercial fisheries for the Morgan Generation Assets and any related mitigation. The consultation programme with UK and international fisheries stakeholders is ongoing and has already included discussion on potential mitigation via fisheries input to array design and layouts (see section 11.3).
Mitigation should be designed to enhance, where reasonably possible, any potential medium and long-term positive benefits to the fishing industry and commercial fish stocks (paragraph 2.6.135 of NPS EN-3).	Mitigation measures are presented in section 11.7.
The Secretary of State will need to consider the extent to which disruption to the fishing industry, whether short term during construction or long term over the operational period, including that caused by the future implementation of any safety zones, has been mitigated where reasonably possible (paragraph 2.6.136 of NPS EN-3).	A range of mitigation options will be explored with the fishing industry representatives and stakeholders of the fishing community, where disruption is anticipated (see section 11.7 and 11.8).

## 11.2.2 North West Inshore and North West Offshore Coast Marine Plans

11.2.2.1 The assessment of potential impacts to commercial fisheries has also been made with consideration to the specific policies set out in the North West Inshore and North West Offshore Coast Marine Plans (MMO, 2021b). Key provisions contained within these plans are set out in Table 11.3, along with details as to how these have been addressed within this assessment.

**Table 11.3: North West Inshore and North West Offshore Marine Plan policies of relevance to commercial fisheries.**

Policy	Key provisions	How and where considered in the PEIR
NW-FISH-2: Fisheries	Proposals that may have significant adverse impacts on access for fishing activities must demonstrate that they will, in order of preference: a) avoid b) minimise c) mitigate - adverse impacts so they are no longer significant. If it is not possible to mitigate significant adverse impacts, proposals should state the case for proceeding.	The Applicant is taking, and will continue to take, steps to minimise the potential impacts upon the fishing industry in the area through appropriate mitigation where required. Designed-in measures related to commercial fisheries are provided in section 11.7.
NW-FISH-3: Fisheries	Proposals that may have significant adverse impacts on essential fish habitat, including spawning, nursery and feeding grounds, and migratory routes, must demonstrate that they will, in order of preference: a) avoid b) minimise c) mitigate - adverse impacts so they are no longer significant.	The Morgan Generation Assets assessment has considered the impacts on fish stocks in volume 2, chapter 8: Fish and shellfish ecology of the PEIR, the chapter includes potential impacts on habitats, spawning, nursery and feeding grounds, and migratory routes
NW-CE-1: Cumulative effects	Proposals which may have adverse cumulative effects with other existing, authorised, or reasonably foreseeable proposals must demonstrate that they will, in order of preference: a) avoid b) minimise c) mitigate – adverse cumulative and/or in-combination effects so they are no longer significant.	Cumulative impacts on commercial fisheries are assessed in section 11.10.
NW-CO-1: Co-existence	Proposals that may have significant adverse impacts on, or displace, existing activities must demonstrate that they will, in order of preference: a) avoid b) minimise c) mitigate – adverse impacts so they are no longer significant. If it is not possible to mitigate significant adverse impacts, proposals must state the case for proceeding	The Applicant is taking, and will continue to take, steps to minimise the impacts upon the fishing industry in the area through appropriate mitigation where required. Designed-in measures related to commercial fisheries are provided in section 11.7, and include a commitment to develop a Fisheries Coexistence and Liaison Plan, which will be submitted as part of the DCO application.

## 11.3 Consultation

- 11.3.1.1 The Applicant is committed to open, constructive, collaborative and solutions-focused consultation with commercial fisheries stakeholders. MarineSpace provides the role of Company Fisheries Liaison Officer (CFLO) on behalf of the Applicant.
- 11.3.1.2 Informal consultation has been undertaken with key local and regional fisheries stakeholders since June 2021, to date. It is intended that these consultations will continue over the consenting phase of the Morgan Generation Assets, to ensure that relevant information from fisheries stakeholders is presented within the final Environmental Statement. It is also intended to ensure consultation continues past the

submission of the consent applications right through to any eventual construction and operations and maintenance phase of the Morgan Generation Assets.

11.3.1.3 In addition to stakeholder meetings focussed on the EIA process, fisheries stakeholders have also been engaged at a detailed level during offshore surveys associated with the Morgan Generation Assets, which have been undertaken in 2021 and 2022.

11.3.1.4 The Scoping Report for the Morgan Generation Assets was submitted in June 2022 to The Planning Inspectorate. Following consultation, the Scoping Opinion was received in July 2022, and responses relevant to commercial fisheries are outlined in Table 11.4.

11.3.1.1 A summary of the key issues specific to commercial fisheries raised during consultation activities undertaken to date is presented in Table 11.4. Table 11.4 also lists how these issues have been considered in the production of this PEIR chapter. Further detail is presented within volume 6, annex 11.1: Commercial fisheries technical report of the PEIR. Information from consultees has been used to inform the baseline in Table 11.4 and volume 6, annex 11.1: Commercial fisheries technical report of the PEIR.

**Table 11.4: Summary of key consultation issues relevant to commercial fisheries raised during consultation activities undertaken for the Morgan Generation Assets.**

Date	Consultee and type of response	Issues raised	Response to issue raised and/or were considered in this chapter
June 2021	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).  Consultation meeting.	<ul style="list-style-type: none"> <li>Concerns regarding array layout and coexistence during the operations and maintenance phase. Scallop vessel representatives stated that they would require greater spacing of wind turbines.</li> <li>Concerns regarding cumulative impacts with other activities and developments in the region.</li> <li>Concerns regarding impacts on fish stocks.</li> <li>Long-term datasets were recommended where possible, particularly due to the dynamic nature of queen scallop beds.</li> <li>There are seven Irish scallop vessels that are normally active in the area from December to April.</li> </ul>	<ul style="list-style-type: none"> <li>Feedback from consultees regarding fishing activity has been presented within the baseline and fed into the design process where possible. Feedback from ongoing consultation on fishing activity will be detailed in the environmental statement submitted at Application.</li> <li>Cumulative effects have been assessed in section 11.10.</li> <li>Assessment of fish stocks has been assessed in volume 2, chapter 8: Fish and shellfish ecology of the PEIR.</li> <li>Ten year datasets have been obtained for landings statistics and Vessel Monitoring System (VMS) data, as outlined in section 11.4.</li> </ul>
June 2021	Scottish Fishermen's Federation (SFF); Scottish White Fish Producers Association (SWFPA); and West Coast Sea Products Ltd (WCSP).  Consultation meeting.	<ul style="list-style-type: none"> <li>Concerns regarding array layout and coexistence during the operations and maintenance phase. Scallop vessels would require greater spacing of wind turbines.</li> <li>Morgan Generation Assets (particularly the west) overlap with key queen scallop grounds.</li> </ul>	<ul style="list-style-type: none"> <li>Feedback from consultees regarding fishing activity has been presented within the baseline and fed into the design process where possible. Feedback from ongoing consultation on fishing activity will be detailed in the environmental statement submitted at Application.</li> </ul>
July 2021	Anglo North Irish Fish Producers Organisation (ANIFPO); Northern Ireland Fish Producers' Organisation (NIFPO); and Rederscentrale.  Consultation meeting.	<ul style="list-style-type: none"> <li>Concerns regarding array layout and coexistence during the operations and maintenance phase. Belgian vessel representatives stated that they would not fish between wind turbines, so preference for closer spacing to minimise overall area of sea affected by the Morgan Array Area.</li> <li>Concerns regarding cumulative and in-combination impacts with other activities and developments in the region.</li> <li>Concerns regarding timing of surveys due to herring spawning – request to avoid seismic activity and grab sampling during spawning period.</li> <li>Belgian vessels active in the east part of the Irish Sea during winter months.</li> <li>Concerns regarding impacts on fish stocks.</li> </ul>	<ul style="list-style-type: none"> <li>Feedback from consultees regarding fishing activity has been presented within the baseline and fed into the design process where possible. Feedback from ongoing consultation on fishing activity will be detailed in the environmental statement submitted at Application.</li> <li>Cumulative effects have been assessed in section 11.10.</li> <li>Assessment of fish stocks has been assessed in volume 2, chapter 8: Fish and shellfish ecology of the PEIR.</li> </ul>
July 2021	NFFO  Consultation meeting.	<ul style="list-style-type: none"> <li>Concerns regarding array layout and coexistence during the operations and maintenance phases.</li> <li>Concerns regarding cumulative and in-combination impacts with other activities and developments.</li> </ul>	<ul style="list-style-type: none"> <li>Feedback from consultees regarding fishing activity has been presented within the baseline and fed into the design process where possible. Feedback from ongoing consultation on fishing activity will be detailed in the environmental statement submitted at Application.</li> <li>Cumulative effects have been assessed in section 11.10.</li> </ul>
February 2022	MFPO, NFFO and WFC.  Consultation meeting.	<ul style="list-style-type: none"> <li>Concerns regarding the interconnectivity of scallop stocks in the region and potential impacts.</li> <li>Discussion regarding inter-array cable layout (and burial depth) to allow scallop fishing during operations and maintenance phase.</li> </ul>	<ul style="list-style-type: none"> <li>The impact on scallop stocks has been assessed in volume 2, chapter 8: Fish and shellfish ecology of the PEIR.</li> <li>Information was collated from stakeholders on gear penetration depth. Cables will be buried where possible (target depth of 1m) and in areas where this is not achievable the cable will be protected (section 11.7). Loss of fishing grounds and snagging risk are assessed in section 11.8.</li> </ul>
February 2022	ANIFPO, Rederscentrale and WFPO.  Consultation meeting.	<ul style="list-style-type: none"> <li>Concerns regarding cumulative and in-combination impacts with other activities and developments.</li> <li>Concerns regarding impacts on fish stocks.</li> <li>Concerns that VMS data does not capture smaller vessels.</li> </ul>	<ul style="list-style-type: none"> <li>Cumulative effects have been assessed in section 11.10.</li> <li>Assessment of fish stocks has been assessed in volume 2, chapter 8: Fish and shellfish ecology of the PEIR.</li> <li>It is acknowledged that there is a lack of data for vessels &lt;15m in length. To ensure that smaller vessels are represented in the baseline (section 11.4 and volume 6, annex 11.1: Commercial fisheries technical report of the PEIR), multiple datasets have been collated which capture vessels &lt;15m in length. For example: consultation is being undertaken to better understand activity of vessels &lt;15m in the region; site specific surveys are also collating information on all fishing vessels, such as the scouting potting surveys and marine traffic surveys, which include vessels &lt;15m.</li> </ul>

Date	Consultee and type of response	Issues raised	Response to issue raised and/or were considered in this chapter
February 2022	SFF, SWFPA and WCSP.  Consultation meeting.	<ul style="list-style-type: none"> <li>• Discussion regarding location of offshore substation to cause least disruption to fisheries.</li> <li>• Concerns that VMS and Automatic Identification System (AIS) data does not capture smaller vessels.</li> <li>• Concerns regarding impact to scallop grounds due to the array layout.</li> <li>• Importance of the queen scallop grounds, particularly in the northwest of the Morgan Generation Assets.</li> </ul>	<ul style="list-style-type: none"> <li>• The offshore booster substation was removed from the PDE.</li> <li>• It is acknowledged that there is a lack of data for vessels &lt;15m in length. See comment above regarding the same concern.</li> <li>• Feedback from consultees regarding fishing activity has been presented within the baseline and fed into the design process where possible. Feedback from ongoing consultation on fishing activity will be detailed in the environmental statement submitted at Application.</li> </ul>
July 2022	The Planning Inspectorate  Scoping Opinion.	<ul style="list-style-type: none"> <li>• The influence of noise impacts on commercial fisheries (i.e. as a result of impacts to targeted species) should be clearly explained and assessed within the Environmental Statement.</li> </ul>	<ul style="list-style-type: none"> <li>• This impact has been considered in section 11.8.7.</li> </ul>
July 2022	The Planning Inspectorate  Scoping Opinion.	<ul style="list-style-type: none"> <li>• The Planning Inspectorate commented that, providing the ES sets out the reasoning for excluding 'loss or damage to fishing gear due to snagging during the construction and decommissioning phase', a detailed assessment is not required.</li> </ul>	<ul style="list-style-type: none"> <li>• This impact has been considered in section 11.8.6.</li> </ul>
July 2022	The Planning Inspectorate  Scoping Opinion.	<ul style="list-style-type: none"> <li>• The Planning Inspectorate agrees that the following impact can be scoped out: increased steaming distances during the operations and maintenance phase.</li> </ul>	<ul style="list-style-type: none"> <li>• This impact is scoped out of the impact assessment (section 11.8).</li> </ul>
July 2022	The Planning Inspectorate  Scoping Opinion.	<ul style="list-style-type: none"> <li>• The Environmental Statement should clearly describe the mitigation measures, with care taken to ensure consistency with cable protection matters considered for other environmental aspects.</li> </ul>	<ul style="list-style-type: none"> <li>• This has been considered and the mitigation measures are outlined in section 11.7.</li> </ul>
July 2022	The Planning Inspectorate  Scoping Opinion response.	<ul style="list-style-type: none"> <li>• The Environmental Statement should assess the potential for the introduction of hard substrate and vessel movements to facilitate the spread of INNS (e.g. via ballast water and through accidents and spillages) and the potential for impacts upon commercial fisheries, where significant effects are likely to occur.</li> </ul>	<ul style="list-style-type: none"> <li>• This impact is considered in volume 2, chapter 7: Benthic subtidal and intertidal ecology of the PEIR and section 11.8.</li> </ul>
July 2022	Marine Licensing  Scoping Opinion response.	<ul style="list-style-type: none"> <li>• The Marine Management Organisation (MMO) would expect to see MMO landings data for the relevant ICES Rectangles be used to support survey data.</li> </ul>	<ul style="list-style-type: none"> <li>• MMO landings data have been analysed and considered in the baseline (section 11.4.4).</li> </ul>
November 2022	Individual static gear operator from Fleetwood  Consultation meeting.	<ul style="list-style-type: none"> <li>• Concerns regarding noise impacts on whelk. Concerns regarding array layout and co-existence during the operational and maintenance phase. Static gear vessels lay gear in a north - south alignment within the Morgan Array Area.</li> <li>• Preference for equally spaced turbines in rows and as far apart as possible.</li> </ul>	<ul style="list-style-type: none"> <li>• Assessment of fish stocks has been assessed in volume 2, chapter 8: Fish and shellfish ecology of the PEIR.</li> <li>• Feedback from consultees regarding fishing activity has been collated and fed into the design process where possible. The MDS has been assessed in the impact assessment (section 11.6).</li> <li>•</li> </ul>
November 2022	SFF, SWFPA and WCSP.  Consultation meeting.	<ul style="list-style-type: none"> <li>• Concerns regarding array layout and co-existence during the operational and maintenance phase. Noted higher density queen scallop ground in the south west part of the Morgan Array Area.</li> <li>• Discussion regarding inter-array cable layout and burial depth to allow scallop fishing during operational and maintenance phase. Gear penetration can vary between 5-25cm.</li> <li>• Concerns regarding impacts on scallop stocks as a result of changes to tidal flow from the installation of wind turbines.</li> </ul>	<ul style="list-style-type: none"> <li>• Feedback from consultees regarding fishing activity has been presented within the baseline and fed into the design process where possible. Feedback from ongoing consultation on fishing activity will be detailed in the environmental statement submitted at Application.</li> <li>• Cables will be buried where possible (target depth of 1m) and in areas where this is not achievable the cable will be protected (section 11.7). Loss of fishing grounds and snagging risk are assessed in section 11.8.</li> <li>• Assessment of fish stocks has been assessed in volume 2, chapter 8: Fish and shellfish ecology of the PEIR.</li> <li>•</li> </ul>

Date	Consultee and type of response	Issues raised	Response to issue raised and/or were considered in this chapter
November 2022	MFPO  Consultation meeting.	<ul style="list-style-type: none"> <li>• Queries regarding array layout and co-existence during the operational and maintenance phase. Noted that the Manx fishing vessels only use approximately 100ft of cable, so are able to fish between turbines.</li> <li>• Discussion regarding inter-array cable layout and burial depth to allow scallop fishing during operational and maintenance phase.</li> <li>• Concerns regarding impacts on scallop stocks as a result of construction and changes to tidal flow from the installation of wind turbines.</li> </ul>	<ul style="list-style-type: none"> <li>• Feedback from consultees regarding fishing activity has been presented within the baseline and fed into the design process where possible, which will be detailed in the environmental statement submitted at Application.</li> <li>• Cables will be buried where possible (target depth of 1m) and in areas where this is not achievable the cable will be protected (section 11.7). Loss of fishing grounds and snagging risk are assessed in section 11.8.</li> <li>• Assessment of fish stocks has been assessed in volume 2, chapter 8: Fish and shellfish ecology of the PEIR.</li> </ul>
November 2022	Rederscentrale  Consultation meeting.	<ul style="list-style-type: none"> <li>• Queries regarding array layout and co-existence during the operational and maintenance phase. Noted that fishing between turbines of 1km spacing 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.</li> <li>• Discussion regarding 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.</li> </ul>	<ul style="list-style-type: none"> <li>• Feedback from consultees regarding fishing activity has been presented within the baseline and fed into the design process where possible, which will be detailed in the environmental statement submitted at Application.</li> <li>• Cables will be buried where possible (target depth of 1m) and in areas where this is not achievable the cable will be protected (section 11.7). Loss of fishing grounds and snagging risk are assessed in section 11.8.</li> <li>•</li> </ul>
November 2022	ANIFPO, NIFPO, WFA  Consultation meeting.	<ul style="list-style-type: none"> <li>• Concerns regarding array layout and co-existence during the operational and maintenance phase. Orientation of wind turbines in a north – south alignment would be preferable.</li> <li>• Concerns regarding timings of surveys to minimise impacts on fish stocks.</li> <li>• Concerns that VMS data does not capture smaller vessels.</li> </ul>	<ul style="list-style-type: none"> <li>• Feedback from consultees regarding fishing activity has been presented within the baseline and fed into the design process where possible, which will be detailed in the environmental statement submitted at Application.</li> <li>• Assessment of fish stocks has been assessed in volume 2, chapter 8: Fish and shellfish ecology of the PEIR.</li> <li>• It is acknowledged that there is a lack of data available for vessels &lt;15m in length. To ensure that smaller vessels are represented in the baseline (section 11.4 and volume 6, annex 11.1: Commercial fisheries technical report of the PEIR), multiple datasets have been collated which capture vessels &lt;15m in length. For example: consultation is being undertaken to better understand activity of vessels &lt;15m in the region; site specific surveys are also collating information on all fishing vessels, such as the scouting potting surveys and marine traffic surveys, which include vessels &lt;15m.</li> </ul>
November 2022	ISEFPO  Consultation meeting.	<ul style="list-style-type: none"> <li>• Queries regarding array layout and co-existence during the operational and maintenance phase.</li> <li>• Discussion regarding inter-array cable layout and burial depth and concerns regarding gear snagging.</li> </ul>	<ul style="list-style-type: none"> <li>• Feedback from consultees regarding fishing activity has been presented within the baseline and fed into the design process where possible, which will be detailed in the environmental statement submitted at Application.</li> <li>• Cables will be buried where possible (target depth of 1m) and in areas where this is not achievable the cable will be protected (section 11.7). Loss of fishing grounds and snagging risk are assessed in section 11.8.</li> </ul>
November 2022	Individual fishing operators from Conwy	<ul style="list-style-type: none"> <li>• Queries regarding co-existence during the operational and maintenance phase.</li> <li>• Concerns regarding spatial squeeze on fishing vessels due to changes in ferry routes as a result of the Morgan Array Area.</li> <li>• Concerns regarding impacts on fish stocks.</li> </ul>	<ul style="list-style-type: none"> <li>• Feedback from consultees regarding fishing activity has been presented within the baseline and fed into the design process where possible, which will be detailed in the environmental statement submitted at Application.</li> <li>• Assessment of fish stocks has been assessed in volume 2, chapter 8: Fish and shellfish ecology of the PEIR.</li> </ul>

## 11.4 Baseline environment

### 11.4.1 Methodology to inform baseline

11.4.1.1 To characterise the baseline environment for commercial fisheries within the commercial fisheries study area (see section 11.1.3) a range of data sources was collated and reviewed, in addition to feedback from project-specific consultation and site-specific surveys. Further information is included within volume 6, annex 11.1: Commercial fisheries technical report.

11.4.1.2 Where possible, data has been collated for a 10 year period, as consultation feedback has indicated that the scallop fisheries in the area of the Morgan Array Area are cyclical, over periods of seven to eight years. Therefore, effort has been made to try and capture this cyclical pattern in the data analysis presented here.

### 11.4.2 Desktop study

11.4.2.1 Information on commercial fisheries activity within the commercial fisheries study area was collected through a detailed desktop review of existing studies and datasets (Table 11.5), feedback from consultation (Table 11.4) and site-specific surveys (Table 11.6). Limitations and assumptions of the datasets are summarised in section 11.4.7 and outlined in further detail in volume 6, annex 11.1: Commercial fisheries technical report of the PEIR.

**Table 11.5: Summary of key desktop data sources/reports.**

Title/Dataset	Source	Year	Author
Landing statistics by ICES Rectangle for UK and Isle of Man vessels	MMO	2010 to 2020	MMO
Landings statistics by port	MMO	2010 to 2020	MMO
Landings statistics by ICES Rectangle for EU vessels	European Union Scientific, Technical and Economic Committee for Fisheries (EU STECF)	2006 to 2016	EU STECF
VMS data for UK and Isle of Man vessels (≥15m)	MMO	2009 to 2020	MMO
VMS data for European mobile bottom contacting gear vessels (>12m)	ICES	2009 to 2020	ICES
ICES scallop assessment working group	ICES	2019	ICES

#### Landing statistics

11.4.2.2 Species landing data is recorded by ICES Rectangle and collected via the EU logbook scheme. Landings data has been collated for the UK and EU Member states for all ICES Rectangles that overlap the Morgan commercial fisheries study area, as illustrated in Figure 11.1.

11.4.2.3 Landings statistics were collated across a 10 year period from each country. Landing statistics include all landings by a country's nationally registered vessel into all ports. The following parameters were examined:

- Gear type
- Year
- ICES Rectangle
- Vessel length
- Species
- Landing port
- Value (£)
- Live weight (tonnes).

#### Vessel monitoring system data

11.4.2.4 VMS data from the period 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 ≥15m vessels and the ICES dataset is from vessels >12m in length. 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.

11.4.2.5 The ICES data analysed only includes mobile bottom contacting gear types, so pots and traps (static gear) were not included. Any additional MMO and ICES data that is likely to become publicly available will be assessed post PEIR.

### 11.4.3 Site-specific surveys

11.4.3.1 Data from a range of site-specific survey activities and/or offshore/remote observations has also been used to inform the commercial fisheries baseline environment (see Table 11.6 for further details). A summary of the surveys that have been used to inform the commercial fisheries baseline environment (and subsequent impact assessment) is outlined in Table 11.6. Information on these surveys is discussed further in volume 6, annex 11.1: Commercial fisheries technical report of the PEIR. Limitations and assumptions of this data are summarised in section 11.4.7, and outlined in further detail in volume 6, annex 11.1: Commercial fisheries technical report of the PEIR.

Table 11.6: Summary of site-specific survey data.

Title	Extent of survey	Overview of survey	Survey contractor	Date	Reference to further information
OFLO observations 2021	Morgan Array Area plus 3km buffer.	OFLO onboard the conventional geophysical and environmental survey vessel recorded observations of fishing vessels and fishing gear present.	NFFO	30 June to 18 September 2021	Volume 6, annex 11.1: Commercial fisheries technical report of the PEIR.
Winter vessel traffic survey	Morgan Array Area	AIS, radar and visual observations collected as part of the 14 day marine traffic survey, required as part of the ongoing Navigational Risk Assessment (NRA).	NASH Maritime	21 November to 04 December 2021	Volume 6, annex 11.1: Commercial fisheries technical report of the PEIR; volume 2, chapter 12: Shipping and navigation of the PEIR; volume 6, annex 12.1: Navigational Risk Assessment of the PEIR.
Summer vessel traffic survey	Morgan Array Area	AIS, radar and visual observations. collected as part of the 14 day marine traffic survey required as part of the ongoing NRA.	NASH Maritime	30 June to 14 July 2022	Volume 6, annex 11.1: Commercial fisheries technical report of the PEIR; volume 2, chapter 12: Shipping and navigation of the PEIR; volume 6, annex 12.1: Navigational Risk Assessment of the PEIR.
OFLO observations 2022	Morgan Array Area plus 3km buffer area.	OFLO onboard the conventional geophysical and environmental survey vessel recorded observations of fishing vessels and fishing gear present.	NFFO	01 April to 10 July 2022	Volume 6, annex 11.1: Commercial fisheries technical report of the PEIR.

Title	Extent of survey	Overview of survey	Survey contractor	Date	Reference to further information
MarineSpace observations 2022	Commercial fisheries study area	Fisheries monitoring using AIS data.	MarineSpace	10 July – 30 November	Volume 6, annex 11.1: Commercial fisheries technical report of the PEIR.

#### 11.4.4 Baseline environment

11.4.4.1 Characterisation of the baseline environment for commercial fisheries is based upon the volume 6, annex 11.1: Commercial fisheries technical report of the PEIR and has been undertaken using the data sources listed in section 11.4.2 alongside feedback from consultation (section 11.3). Limitations of the data have been discussed fully in the volume 6, annex 11.1: Commercial fisheries technical report of the PEIR.

#### Overview of landings data

11.4.4.2 Data compiled by both the MMO (MMO, 2020a) and EU STECF<sup>1</sup> (EU STECF, 2017) was reviewed for the most recently available 10 year period of landings (2010 to 2020 and 2006 to 2016 respectively). MMO and EU STECF datasets were filtered to show only landings from the commercial fisheries study area (ICES Rectangles 36E5, 36E6, 37E5 and 37E6). The Morgan Array Area (illustrated on Figure 11.1) will be located within ICES Rectangles 36E5, 36E6, 37E5 and 37E6.

11.4.4.3 The MMO data indicates that, over the period 2010 to 2020, shellfish was the most important species group in terms of landed weight and value for UK vessels (Figure 11.2 and Figure 11.3), with the highest landings from ICES Rectangle 37E5. Landings of demersal and pelagic species were considerably lower than shellfish.

11.4.4.4 As expected, for UK vessels, the largest proportion of vessels was from the >10m class; these vessels were predominantly from England, the Isle of Man, Northern Ireland, Scotland and Wales. The smaller UK vessels were predominantly from the Isle of Man and England, reflecting the closer proximity of home ports to this fleet, with relatively small recordings of landings for Welsh, Scottish and Northern Irish vessels.

11.4.4.5 Dredges accounted for approximately 59% of total landings by UK vessels from the commercial fisheries study area. This indicates the importance of the queen and king scallop fisheries in the region. Demersal trawl/seine (targeting demersal dwelling species) were also of notable importance in the commercial fisheries study area and consisted mostly of vessels >10m in length.

<sup>1</sup> EU STECF is a group of experts, appointed by the European Commission, that undertakes scientific work, provides scientific advice on fisheries management and implements a data collection framework.



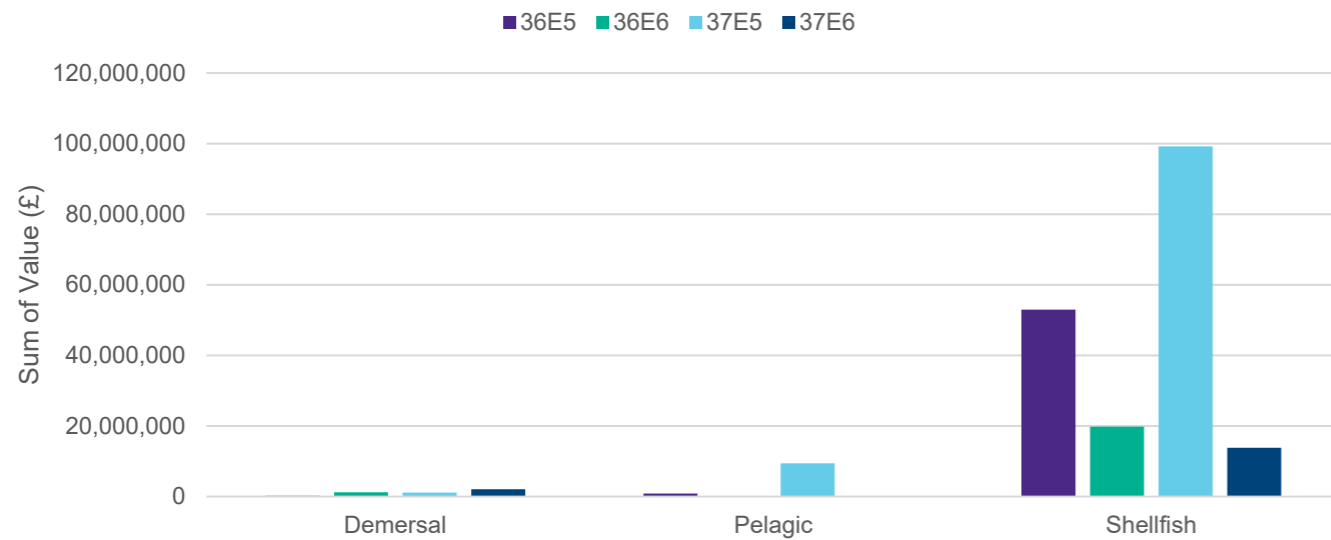


Figure 11.2: Sum of landed value (2010 to 2020) within the commercial fisheries study area, displayed by species group and vessel class (UK vessels)<sup>2</sup>.

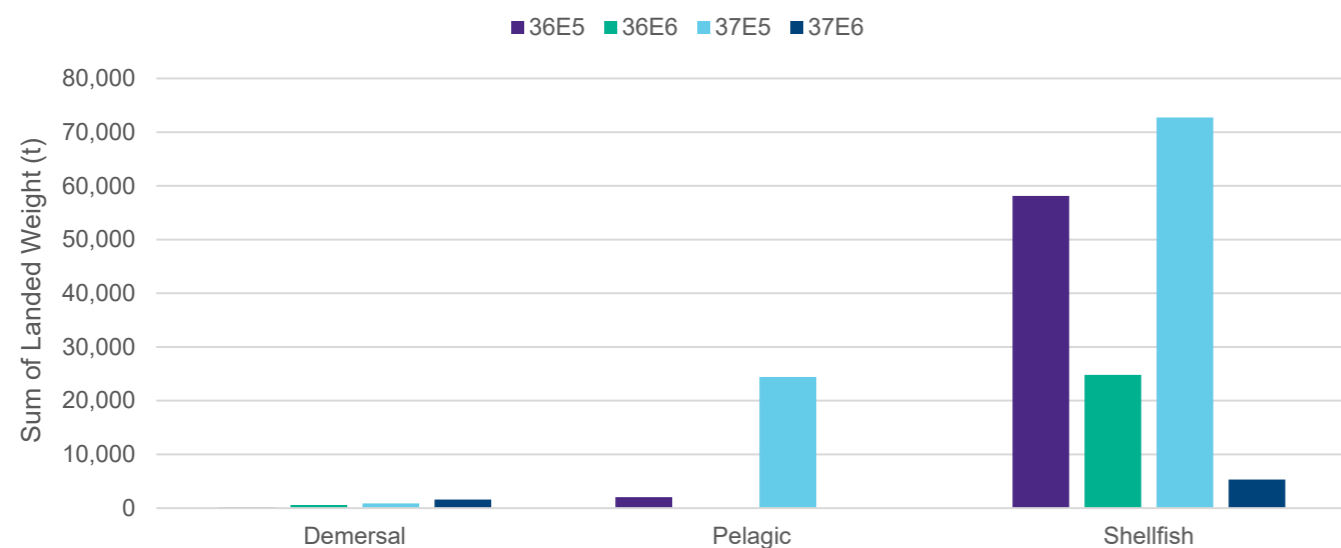


Figure 11.3: Sum of landed weight (2010 to 2020) within the commercial fisheries study area, displayed by species group and vessel class (UK vessels)<sup>3</sup>.

11.4.4.6 As would be expected, due to the distance from their home ports and the capabilities of the vessels, no non-UK vessels <10m were active across the commercial fisheries study area. The majority of total landings from non-UK vessels in the region were from vessels >15m in length, from Belgium and Ireland (Figure 11.4). The majority of non-UK vessels were utilising beam trawls and dredges. Key species were common sole, European plaice, thornback ray, rays and skates, and brill. There was a large variety

of species caught by the Belgian and Irish fleets and, given the understanding that both fleets almost exclusively use beam trawls and dredges, this suggests that other species may have been caught as bycatch during fishing for the main target species. Both beam trawls and dredge gear types exhibit poor selectivity and, hence, tend to have high by-catch rates.

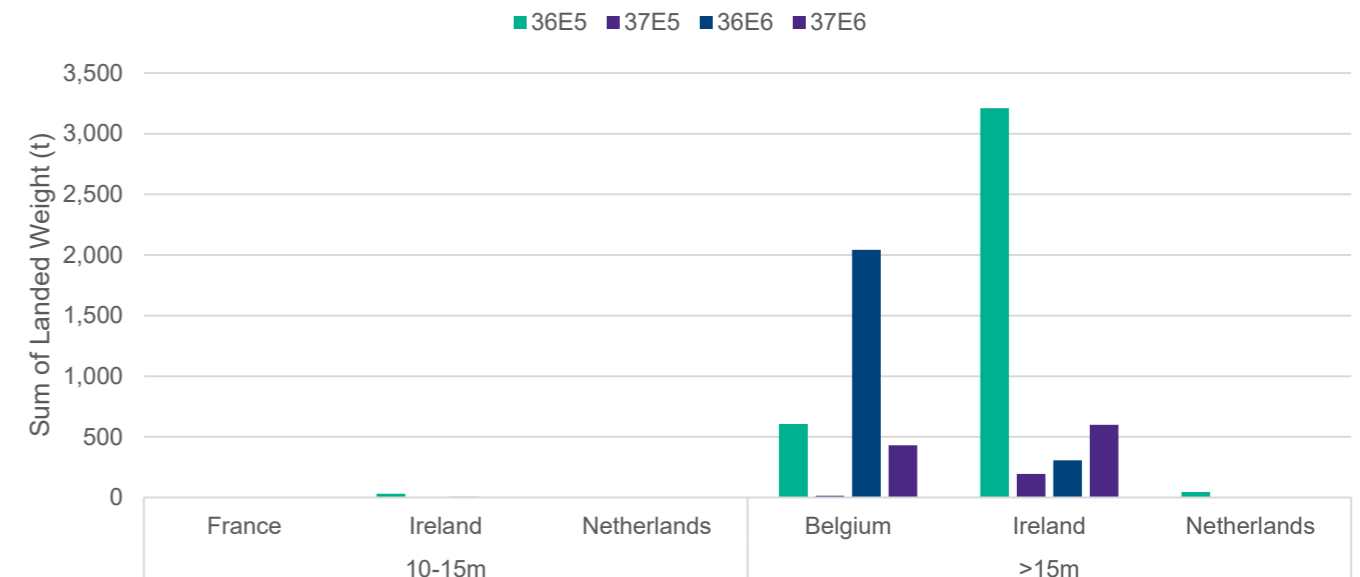


Figure 11.4: Sum of landed weight by vessel size class (2006-2016) within the commercial fisheries study area (non-UK vessels)<sup>4</sup>.

### Seasonal temporal change

11.4.4.7 In terms of intra-annual variation, landings varied for all species/vessels over the period, with a clear seasonal pattern of highest weight of landings between March and November each year (Figure 11.5).

11.4.4.8 For the top five species landed by UK vessels within the commercial fisheries study area (Figure 11.5), the following were the key periods for highest weight and value:

- Queen scallop – July to September
- King scallop – November to May
- Herring – August to September
- Whelk – May to July
- Norway lobster – April to July.

11.4.4.9 For the non-UK fleet, based on the EU STECF data, the top five species landed within the commercial fisheries study area are king scallop, common sole, European plaice, Norway lobster and thornback ray. Based on data presented only by quarter, the periods January to March and April to June appear to be the most important in terms

<sup>2</sup> MMO, 2020a

<sup>3</sup> MMO, 2020a

<sup>4</sup> EU STECF, 2017

of landings, especially for species such as common sole and thornback ray. July to September was the least productive quarter, likely due to seasonal scallop closures in the area.

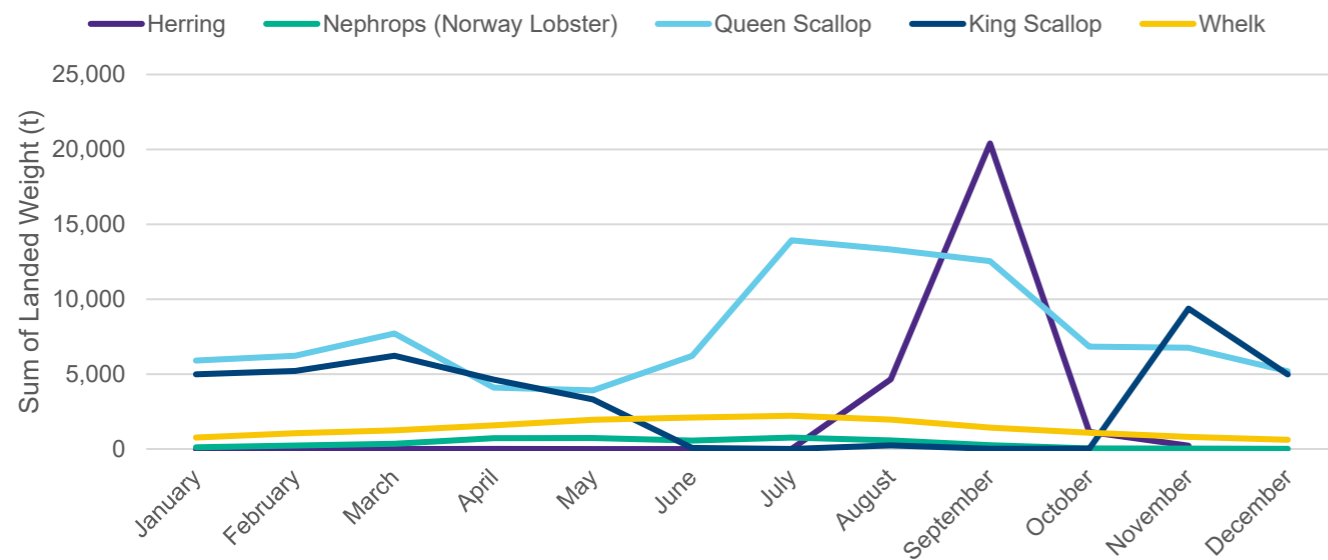


Figure 11.5: Seasonal trends in top five species by total landed weight (tonnes) from UK vessels across the commercial fisheries study area (2010 to 2020) <sup>5</sup>.

**Annual temporal change**

11.4.4.10 In terms of annual variation for UK vessels between 2010 to 2020, landings varied for all species/vessels over the period, with a considerably lower weight/value of queen scallop landings during 2017 to 2020 than between 2010 to 2017 (Figure 11.6). Landings of whelk generally increased between 2011 to 2020. Landings of king scallop, herring and Norway lobster fluctuated yearly.

11.4.4.11 For the non-UK fleet, the EU STECF data showed that between 2006 to 2016, the year 2006 appeared to be the most important in terms of landings across the commercial fisheries study area. Landings of king scallop were significantly higher between 2010 to 2016 than the previous years, which aligns with feedback from project-specific consultation regarding the cyclical nature of the fishery.

<sup>5</sup> MMO, 2020a

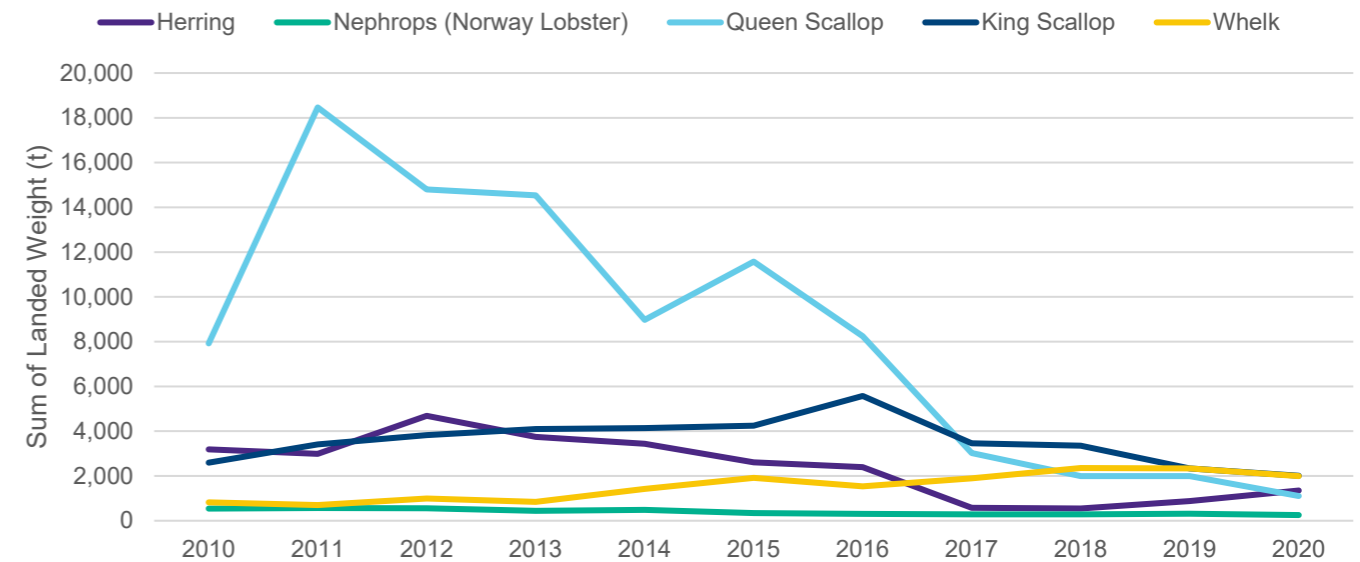


Figure 11.6: Annual trends in top five species by total landed weight (tonnes) from UK vessels across the commercial fisheries study area (2010 to 2020) <sup>6</sup>.

**Spatial distribution of fishing activity/effort**

11.4.4.12 The spatial distribution of fishing activity/value in the commercial fisheries study area has been described within volume 6, annex 11.1: Commercial fisheries technical report of the PEIR, based on review and analysis of multiple datasets as well as direct consultation with individual skippers and fisheries organisations; relevant datasets are listed in Table 11.5. The datasets show that fishing occurs within parts of the Morgan Array Area to varying degrees. A summary of the key regional fisheries is provided below.

**Static gear**

11.4.4.13 Analyses of the MMO VMS data (2016 to 2020) for static gear vessels (MMO, 2021a), split by ICES sub rectangle, show that the spatial distribution of UK static gear vessels ≥15m varies yearly across the commercial fisheries study area.

11.4.4.14 UK static gear vessels ≥15m were active across the commercial fisheries study area. Higher intensities of potting activity were generally observed between Barrow-in-Furness and the English-Welsh maritime boundary, and north of the Isle of Man. Within the Morgan Array Area, levels of potting were generally higher in the east (volume 6, annex 11.1: Commercial fisheries technical report of the PEIR, Figure 1.49). Feedback from project-specific consultation with fisheries stakeholders has suggested that this activity is mostly from whelk vessels.

**Dredge gear**

11.4.4.15 Within the commercial fisheries study area, landings using mechanical dredge accounted for approximately 59% of total landings by UK vessels. Of these UK

<sup>6</sup> MMO, 2020a

vessels, the MMO landings data indicated notable importance of the dredge fishery to the Scottish, Isle of Man and Northern Irish fisheries, as their vessels deploying dredges accounted for the majority of their total landed weight. In terms of non-UK vessels, the Irish fleet accounted for the largest proportion of dredge vessels.

11.4.4.16 The dredge fishery targets scallops, with minimal landings of other commercial species. Landings by Isle of Man dredge vessels are highest from 37E5, with notable landings also from 36E5; landings by Scottish dredge vessels are highest from 36E5, with notable landings from 36E6 and 37E5; landings by Northern Irish dredge vessels were notable from 37E5, 36E5 and 36E6; landings by Irish dredge vessels were highest from 36E5. VMS data indicated that highest intensities of the dredge fishery were within the Isle of Man 12nm limit, and within the west parts 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 an important queen scallop fishing ground, whereas the east part of the Morgan Array Area is of lesser importance to the scallop fisheries.

11.4.4.17 Annual landed weight by the dredge fishery was highly variable, with considerably lower catches within the commercial fisheries study area between 2017 to 2020, compared with 2010 to 2016 (Figure 11.6). This reflects the somewhat cyclical nature of scallop fisheries, where particular grounds are more productive in certain years and are, therefore, targeted on a cyclical basis, as indicated by fisheries stakeholders in consultation workshops.

**Demersal fishery – beam trawl**

11.4.4.18 VMS data illustrating beam trawl (vessels >12m) activity over the period 2009 to 2020, showed sporadic overlap with small areas in the east of the Morgan Array Area, at a relatively low intensity (volume 6, annex 11.1: Commercial fisheries technical report of the PEIR, Figure 1.50). There were two areas of higher intensity beam trawling activity within the commercial fisheries study area which did not overlap with the Morgan Array Area; these areas were observed to the south of the Isle of Man, and beyond the 12nm limit of English waters.

11.4.4.19 Within the commercial fisheries study area, the landings data indicates that landings by vessels using beam trawl were predominantly undertaken by Belgian and southwest coast English fleets. The target species of this fishery are sole and plaice, which are principally taken from ICES Rectangles 36E6 and 36E5. This coincides with information provided from fisheries stakeholders within consultation, which has indicated that beam trawl vessels from the southwest of the UK are active in the Morgan Array Area during the Spring, with these vessels predominantly targeting sole and plaice. Belgian beam trawl vessels are active within the commercial fisheries study area, but do not fish where the Morgan Array Area is located. Beam trawl activity fluctuated across the time period studied.

**Demersal fishery – otter trawl**

11.4.4.20 Otter trawl vessels from Belgium, England, Isle of Man, Northern Ireland, Scotland and Wales were active within the commercial fisheries study area; although 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.

11.4.4.21 VMS data illustrating activity by otter trawl vessels (>12m) from England, Isle of Man and Northern Ireland displays highest observed levels within in the west and northeast of the commercial fisheries study area, with an area of activity also located southeast of the Isle of Man (volume 6, annex 11.1: Commercial fisheries technical report of the PEIR, Figure 1.52). Activity within the Morgan Array Area was generally limited to the west part, which is likely due to vessels targeting scallop. The higher intensity area off the Cumbria coast shows the *Nephrops* grounds, although this does not overlap with the Morgan Array Area.

**11.4.5 Receptor groups**

11.4.5.1 From the overview of the commercial fisheries baseline environment presented in the previous sections, it is clear to note that there is a range of UK and non-UK fleets targeting a number of different fisheries in the commercial fisheries study area. The diverse nature of these fleets and fisheries means that potential impacts on the Morgan Generation Assets will vary depending on the fleet concerned.

11.4.5.2 To ensure that potential impacts which may affect certain fleets/fisheries in different ways are fully assessed, a number of commercial fisheries receptor groups have been identified through review of data and feedback from stakeholder consultation. A total of six main receptor groups have been defined. These have been categorised based on gear type, nature of fishing activity and nationality and are summarised in Table 11.7.

11.4.5.3 It is important to note that not all commercial fishing fleets active in the commercial fisheries study area will be affected by the Morgan Generation Assets. Inshore static gear vessels have been scoped out of this assessment, as it is not anticipated that they will be affected by the proposed development of the Morgan Generation Assets. They are not active within, or in the vicinity of, the Morgan Array Area, and the data shows very low levels of activity within the commercial fisheries study area. Norway lobster (*Nephrops*) vessels have been assessed within the displacement impact but scoped out for all other impacts. This receptor group shows relatively high levels of activity, northeast of the Morgan Array Area, so could be affected by vessels displaced by the Morgan Generation Assets. However, these vessels are not active within the Morgan Array Area, so will not be directly affected by any other impacts.

**Table 11.7: Key commercial fisheries receptor groups used in this assessment.**

Receptor Group	Description
Offshore static gear vessels	Larger (>12m) static gear vessels that are active offshore (beyond 12nm) and within the Morgan Array Area. These are predominantly English vessels that mostly target whelk, as established by project-specific consultation.
Beam trawl vessels	Beam trawl vessels that are active across the commercial fisheries study area. Vessels are predominantly from Belgium and the south coast of England that mostly target sole and plaice, as established by project-specific consultation, but may include vessels from other UK jurisdictions and Ireland. Vessels from the south coast of England are active within the Morgan Array Area, whereas Belgium beam trawl vessels are not.
Scallop vessels – Scottish west coast	West coast based Scottish vessels deploying dredges that are active across the commercial fisheries study area, targeting king and queen scallop. Key ports for this receptor group include Kirkcudbright and Annan. The west coast based Scottish scallopers are particularly active within the commercial fisheries study area for the dredging of queen scallop.

Receptor Group	Description
Scallop vessels – Isle of Man	Vessels from the Isle of Man deploying dredges and otter trawls that are active across the commercial fisheries study area, including the Morgan Array Area, targeting king and queen scallop. Fishing techniques in the Isle of Man differ to the rest of the UK fleet due to the fisheries regulations set out by the Isle of Man Government and the main target species.
Other Scallop vessels	Vessels deploying dredges that are active across the commercial fisheries study area, targeting king and queen scallop. Vessels are predominantly from Northern Ireland and Ireland, as established by project-specific consultation, but may also include more nomadic vessels from other UK jurisdictions.
Herring vessels	Vessels deploying pelagic trawls and seine nets that are active across the commercial fisheries study area, targeting herring. Vessels are predominantly from Ireland and Northern Ireland, as established by MMO and EU STECF landings data, and project-specific consultation.
Norway lobster ( <i>Nephrops</i> ) vessels	Vessels predominantly deploying demersal trawls/seine and otter trawls that are active across the commercial fisheries study area, targeting Norway lobster ( <i>Nephrops</i> ). Vessels are predominantly from England, Northern Ireland and Scotland, as established by MMO and EU STECF landings data, and project-specific consultation.

### 11.4.6 Future baseline scenario

- 11.4.6.1 The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 requires that the future baseline scenario is presented within the Environmental Statement. The Regulations state that the Environmental Statement must include: “an outline of the likely evolution thereof without implementation of the development as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge”. In the event that the Morgan Generation Assets is not developed further in the future, an assessment of potential future baseline conditions has been carried out and is described within this section.
- 11.4.6.2 The baseline environment for commercial fisheries is constantly evolving. The fishing industry is dynamic, with frequent and sometimes unpredictable changes which affect activity, for example, 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 ‘Brexit’, overfishing and spatial conflict are considered key future issues for the fishing industry (Salthouse, 2021). More recently, increased fuel prices and the Covid-19 pandemic are likely to impact fishing activity; for example, vessels with longer transit times may reduce their activity in the region, due to higher fuel prices.
- 11.4.6.3 The baseline was described using the most recent datasets available and across a 10 year time period, where possible. This time period was selected to 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.
- 11.4.6.4 At the time of writing, uncertainty remains with respect to impacts of the UK’s withdrawal from the Common Fisheries Policy (CFP) and how fishing activity may be affected within the commercial fisheries study area. 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 11.8 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.

**Table 11.8: Quota share changes by 2026 for the UK, for species within the Irish Sea.<sup>7</sup>**

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%

- 11.4.6.5 Prior to the new trade agreement, a large percentage of fish caught in the region was sold to EU markets, so introduction of the Catch Certificate and other supporting documents, as well as changes to tariffs, could act as a considerable barrier to particular markets. Landings of species, such as whelk, which are exported to non-UK countries may increase as a result.

### 11.4.7 Data limitations

- 11.4.7.1 Limitations with data sources used have been discussed fully in volume 6, annex 11.1: Commercial fisheries technical report of the PEIR. The use of various datasets, combined with feedback from stakeholder consultation, has managed the limitations of the data; therefore, the limitations identified are not considered to affect the certainty/predictability of the impact assessment in section 11.8.
- 11.4.7.2 It should be noted that although smaller vessels are not captured within the MMO (<15m vessels) and ICES (<12m vessels) VMS data, information on their activity has been reviewed through feedback from stakeholder consultation and other supplementary data sources, such as information gathered via site specific surveys undertaken in 2021 and 2022.
- 11.4.7.3 The landings statistics datasets are only available by the ICES rectangle, so these only give an indication of commercial fisheries activity for a general area. Vessels ≤10m are not required to complete logbooks, so may be under-represented within the landings statistics.
- 11.4.7.4 Data collected via site specific surveys, only capture fishing activity during a short time period and have, therefore, only been used to supplement the official datasets and corroborate feedback from consultation with fisheries stakeholders. However, the site-

<sup>7</sup> ABPmer, 2021

specific surveys are useful to provide context on fishing activity over the last few years, which the official datasets do not currently cover.

## 11.5 Impact assessment methodology

### 11.5.1 Overview

11.5.1.1 The commercial fisheries impact assessment has followed the methodology set out in volume 1, chapter 5: EIA methodology of the PEIR. Specific to the commercial fisheries impact assessment, the following guidance documents have also been considered:

- FLOWW Best Practice Guidance for Offshore Renewables Developments: Recommendations for Fisheries Liaison: FLOWW (Fishing Liaison with Offshore Wind and Wet Renewables Group) (FLOWW, 2014)
- FLOWW Best Practice Guidance for Offshore Renewables Developments: Recommendations for Fisheries Disruption Settlements and Community Funds. FLOWW (Fishing Liaison with Offshore Wind and Wet Renewables Group) (FLOWW, 2015)
- Best Practice Guidance for Fishing Industry Financial and Economic Impact Assessments (United Kingdom Fisheries Economics Network (UKFEN), 2012)
- Options and opportunities for marine fisheries mitigation associated with windfarms (Blyth-Skyrme, 2010)
- Fishing and Submarine Cables – Working Together (International Cable Protection Committee (ICPC), 2009)
- RenewableUK (2013) Cumulative impact assessment guidelines, guiding principles for cumulative impacts assessments in offshore wind farms.

### 11.5.2 Impact assessment criteria

11.5.2.1 The criteria for determining the significance of effects is a two-stage process that involves defining the magnitude of the impact and the sensitivity of the receptor. This section describes the criteria applied in this chapter to assign values to the magnitude of potential impacts and the receptor sensitivity. The terms used to define magnitude and sensitivity are based on those which are described in further detail in volume 1, chapter 5: EIA methodology of the PEIR.

11.5.2.2 The criteria for defining magnitude of impact in this chapter are outlined in Table 11.9 below. It should be noted that beneficial impacts as a result of the Morgan Generation Assets are also possible. In such a case, the same definitions would apply as in Table 11.9, albeit in reverse (e.g. the impact would affect an area from which a minor proportion (5-20%) of a commercial fishing receptor’s annual value of landings is caught and/or would lead to a 5-20% increase in annual value of landings).

**Table 11.9: Definition of terms relating to magnitude of impact.**

Magnitude of impact	Definition
High	The effect would be permanent/irreplaceable change and is likely to occur.
	The impact would permanently affect an area from which the majority (>50%) of a commercial fishing receptor’s annual value of landings is caught and/or would lead to a >50% reduction in annual value of landings.
Medium	The effect would be long-term (e.g. less than 35 years) though reversible and is likely to occur.
	The impact would affect an area from which a moderate proportion (20-50%) of a commercial fishing receptor’s annual value of landings is caught and/or would lead to a 20-50% reduction in annual value of landings.
Low	The effect would be short to medium term (e.g. less than four years) through reversible and could possibly occur.
	The impact would affect an area from which a minor proportion (5-20%) of a commercial fishing receptor’s annual value of landings is caught and/or would lead to a 5-20% reduction in annual value of landings.
Negligible	The effect would be short-term (e.g. less than two years), intermittent and reversible and unlikely to occur.
	The impact would affect an area from which a very small proportion (<5%) of a commercial fishing receptor’s annual value of landings is caught and/or would lead to a <5% reduction in annual value of landings.
No change	No loss or alteration of characteristics, features or elements; no observable impact either adverse or beneficial.

11.5.2.3 The criteria for defining sensitivity in this chapter are outlined in Table 11.10 below.

**Table 11.10: Definition of terms relating to sensitivity of the receptor.**

Sensitivity	Definition
High	Very low spatial adaptability due to limited operational range and/or very low ability to deploy more than one gear type.
	Very limited spatial tolerance due to dependence upon a single ground.
	Very low recoverability due to inability to mitigate loss of fishing area by operating in alternative areas.
Medium	Limited spatial adaptability due to extent of operational range and/or limited ability to deploy an alternative gear type.
	Limited spatial tolerance due to dependence upon a limited number of fishing grounds.
	Limited recoverability with some ability to mitigate loss of fishing area by operating in alternative areas.
Low	Moderate spatial adaptability due to extensive operational range and/or moderate ability to deploy an alternative gear type.
	Moderate spatial tolerance due to ability to fish numerous fishing grounds.
	Moderate recoverability due to ability to mitigate loss of fishing area by operating in a range of alternative areas of the Irish Sea.

Sensitivity	Definition
Negligible	Category of fishing receptor with an extensive operational range and high method versatility. Vessel able to exploit a large number of fisheries.

11.5.2.4 The significance of the effect upon commercial fisheries is determined by correlating the magnitude of impact with the sensitivity of the receptor. The particular method employed for this assessment is presented in Table 11.11. Where a range of significance of effect is presented, the final assessment for each effect is based upon expert judgement.

11.5.2.5 For the purposes of this assessment, any impacts with a significance level of minor or less are not significant in terms of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017. As discussed, such impacts can be either adverse or beneficial.

11.5.2.6 Where impacts fall within a range of 'minor or moderate' within Table 11.11, the final assessment of significance in EIA terms has been made based on the understanding of the receptor.

**Table 11.11: Matrix used for the assessment of the significance of effect.**

Sensitivity of Receptor	Magnitude of Impact				
	No Change	Negligible	Low	Medium	High
Negligible	No change	Negligible	Negligible or Minor	Negligible or Minor	Minor
Low	No change	Negligible or Minor	Negligible or Minor	Minor	Minor or Moderate
Medium	No change	Negligible or Minor	Minor	Moderate	Moderate or Major
High	No change	Minor	Minor or Moderate	Moderate or Major	Major

## 11.6 Key parameters for assessment

### 11.6.1 Maximum design scenario

11.6.1.1 The MDSs identified in Table 11.12 have been selected as those having the potential to result in the greatest effect on an identified receptor or receptor group. These scenarios have been selected from the Project Design Envelope (PDE) provided in volume 1, chapter 3: Project description of the PEIR. Effects of greater adverse significance are not predicted to arise should any other development scenario, based on details within the PDE (e.g. different infrastructure layout), to that assessed here, be taken forward in the final design scheme.

**Table 11.12: MDS considered for the assessment of potential impacts on commercial fisheries.**

<sup>a</sup> C=construction, O=operation and maintenance, D=decommissioning

Potential impact	Phase <sup>a</sup>			Maximum Design Scenario	Justification
	C	O	D		
Loss or restricted access to fishing grounds	✓	✓	✓	<p><b>Construction phase</b></p> <p>Loss or restricted access to fishing grounds due to:</p> <ul style="list-style-type: none"> <li>Duration: up to four years, however, during this period, fishing activity may only be excluded from discrete spatial areas (i.e. only parts of the Morgan Generation Assets where construction is taking place will be subject to temporary restrictions)</li> <li>During the construction phase the loss or restricted access to fishing grounds will be gradual, as the presence of infrastructure increases; reaching the MDS outlined below, in the operations and maintenance phase. The MDS in terms of the presence of infrastructure would be on the completion of construction, during the operations and maintenance phase</li> <li>Construction safety zones: 500m safety zones around wind turbines and Offshore Substation Platforms (OSPs) during their construction. 50m safety zone around each item of infrastructure during the construction phase, where no construction works are taking place on that infrastructure (for example, where a wind turbine is incomplete or is in the process of being tested before commissioning). It is proposed that rolling advisory exclusion zones of 500m will also be present around vessels installing inter-array cables, interconnector cables and subtidal export cables. The loss or restricted access to fishing grounds created by such exclusion zones will be gradual as the presence of infrastructure increases. Temporary restrictions to fishing activity and/or anchoring, will also be required in areas where full cable burial to target depth has not yet been achieved and/or surface-laid cable exists (prior to cover by external cable protection). In such areas of temporarily shallow-buried/surface-laid cable, the restricted areas will be monitored by Guard Vessels.</li> </ul> <p>Seabed preparation:</p> <ul style="list-style-type: none"> <li>Sandwave and boulder clearance, dredging, backfilling and rock installation for wind turbines, OSPs, inter-array cables, interconnector cables and throughout the Morgan Generation Assets, over a duration of approximately 12 months within the wider Morgan Generation Assets construction programme</li> <li>Existing cable removal: up to 46km.</li> </ul> <p>Reduction of access around infrastructure during construction:</p> <ul style="list-style-type: none"> <li>Wind turbines:                             <ul style="list-style-type: none"> <li>up to 107 wind turbines</li> <li>minimum spacing 1,000m between rows of wind turbines and 875m between wind turbines in a row<sup>8</sup></li> <li>seabed footprint of up to 524,300m<sup>2</sup> (inclusive of scour protection)</li> </ul> </li> <li>OSPs: up to four OSPs with a seabed footprint of up to 24,964m<sup>2</sup> (inclusive of scour protection)</li> <li>Inter-array cables: up to 500km of inter-array cables, buried (where possible) to a minimum depth of 0.5m</li> <li>Inter-array cable protection: up to 50km (10% of total length) of inter-array cables may require cable protection (steel armour wire, rock dump or mattresses), up to a height of 3m and a width of 10m</li> <li>Inter-array crossings: up to 67 crossings with concrete mattresses and rock berm, maximum dimensions – 4m height x 60m length x 32m width</li> <li>Interconnector cables: up to 50km of interconnector cables, buried (where possible) to a minimum depth of 0.5m.</li> <li>Interconnector cable protection: up to 10km (20% of total length) of interconnector cables may require cable protection (steel armour wire, rock dump or mattresses) up to a height of 3m and a width of 10m</li> <li>Interconnector crossings: up to 10 crossings with concrete mattresses and rock berm, maximum dimensions – 3m height x 50m length x 20m width</li> </ul>	Maximum duration and extent of fishing exclusion, and therefore the greatest potential to restrict access to fishing grounds.

<sup>8</sup> Within this chapter, the minimum distance of 1,000m between rows of wind turbines will be used to assess impacts on commercial fisheries receptors.

Potential impact	Phase <sup>a</sup>			Maximum Design Scenario	Justification
	C	O	D		
				<p><b>Operations and maintenance phase</b></p> <ul style="list-style-type: none"> <li>• Operation duration: 35 years</li> <li>• Operation safety zones: 500m around any vessel involved in major maintenance works</li> <li>• Reduction of access around infrastructure as per the construction phase above; however, fishing assumed to continue within the Morgan Array Area, where possible; external cable protection will be designed to increase potential for coexistence.</li> <li>• Cable repair/reburial activities:</li> <li>• Inter-array cables:                             <ul style="list-style-type: none"> <li>- repair of up to 8km of cable in one event every three years</li> <li>- reburial of up to 20km of cable in one event every five years</li> </ul> </li> <li>• Interconnector cables:                             <ul style="list-style-type: none"> <li>- repair of up to 20km of cable in each of three events every 10 years</li> <li>- reburial of up to 3km of cable in one event every five years</li> </ul> </li> <li>• Up to a total of 21 operations and maintenance vessels on site at any one time</li> <li>• Up to 2,351 operations and maintenance vessel movements (return trips) each year.</li> </ul> <p><b>Decommissioning phase</b></p> <ul style="list-style-type: none"> <li>• During the decommissioning phase the loss or restricted access to fishing grounds would gradually decrease from the operational MDS as structures above the seabed are removed and cut below the seabed.</li> </ul>	
Displacement of fishing activity into other areas	✓	✓	✓	As for 'Loss or restricted access to fishing grounds' – see above.	Maximum duration and extent of fishing exclusion, and hence the greatest potential for gear conflict and increased pressure on adjacent grounds.
Interference with fishing activity	✓	✓	✓	<p><b>Construction phase</b></p> <ul style="list-style-type: none"> <li>• Duration: up to four years, however, during this period, fishing activity will only be excluded from discrete spatial areas (i.e. only parts of the Morgan Generation Assets will be subject to temporary restrictions where construction is taking place).</li> <li>• Up to a total of 62 construction vessels on site at any one time</li> <li>• Up to 1,828 installation vessel movements (return trips) during construction</li> </ul> <p><b>Operations and maintenance phase</b></p> <ul style="list-style-type: none"> <li>• Operation duration: 35 years</li> <li>• Up to a total of 21 operations and maintenance vessels on site at any one time</li> <li>• Up to 2,351 operation and maintenance vessel movements (return trips) each year.</li> </ul> <p><b>Decommissioning phase</b></p> <ul style="list-style-type: none"> <li>• During the decommissioning phase the changes would gradually decrease from the operational MDS as the need for project-related vessels is reduced.</li> </ul>	Maximum amount of infrastructure and number of vessel transits.
Temporary increase in steaming distances (Morgan Array Area – construction and decommissioning phases)	✓	*	✓	As for 'Loss or restricted access to fishing grounds' – see above.	Maximum potential disruption to established steaming routes.
Loss or damage to fishing gear due to snagging	✓	✓	✓	As for 'Loss or restricted access to fishing grounds' and 'interference with fishing activity' – see above.	Maximum duration and extent of seabed obstructions and therefore the maximum potential for interactions between infrastructure and fishing gear.



Potential impact	Phase <sup>a</sup>			Maximum Design Scenario	Justification
	C	O	D		
Potential impacts on commercially important fish and shellfish resources	✓	✓	✓	As described in volume 2, chapter 8: Fish and shellfish ecology of the PEIR.	Greatest disturbance to fish and shellfish species, and therefore the resulting effect to commercial fisheries.
Supply chain opportunities for local fishing vessels	✓	✓	✓	<p><b>Construction phase</b></p> <ul style="list-style-type: none"> <li>Duration: up to four years, however, during this period, fishing activity will only be excluded from discrete spatial areas (i.e. only parts of the Morgan Generation Assets will be subject to temporary restrictions)</li> <li>Likely number of guard vessels onsite at one time (array): one</li> <li>Potential provision of fishing vessel for visual checks of project infrastructure</li> <li>Potential provision of fishing vessel for scouting surveys</li> <li>Potential for Offshore Fisheries Liaison Officer (OFLO) duties.</li> </ul> <p><b>Operations and maintenance phase</b></p> <ul style="list-style-type: none"> <li>There may be opportunities for commercial fishing vessels to provide marine operation support during the operations and maintenance phase (35 years) of the Morgan Generation Assets, such as OFLO duties during period of major maintenance and guard vessel requirements.</li> </ul> <p><b>Decommissioning phase</b></p> <ul style="list-style-type: none"> <li>In the absence of detailed methodologies, the supply chain opportunities for local fishing vessels are considered the same as for the construction phase.</li> </ul>	Potential opportunities for local fishing vessels (potential beneficial impact for commercial fishing vessels).
Increased risk of introduction and spread of invasive non-native species (INNS)	✓	✓	✓	This impact has been considered in volume 2, chapter 7: Benthic subtidal and intertidal ecology of the PEIR.	Maximum surface area created by offshore infrastructure and maximum number of vessel movements during construction, operations and maintenance and decommissioning phases.
Increased collision and allision risk to commercial fishing vessels	✓	✓	✓	This impact has been considered in volume 2, chapter 12: Shipping and navigation of the PEIR.	Greatest extent of the Morgan Generation Assets over the longest duration, with the maximum number of project vessel movements, therefore the highest potential for increases in the risk of collision and allision.

### 11.6.2 Impacts scoped out of the assessment

11.6.2.1 On the basis of the baseline environment and the description of development outlined in volume 1, chapter 5: Project description of the PEIR, a number of impacts are proposed to be scoped out of the assessment for commercial fisheries. These impacts are outlined, together with a justification for scoping them out, in Table 11.13.

**Table 11.13: Impacts scoped out of the assessment for commercial fisheries.**

Potential impact	Justification
Increased steaming distances during the operations and maintenance phase.	Once the Morgan Generation Assets have been constructed, fishing vessels will be able to transit through the Morgan Array Area to/from adjacent fishing grounds. The presence of wind farm infrastructure during the operations and maintenance phase would not affect steaming distances.  The Planning Inspectorate agreed in the Scoping Opinion that this matter can be scoped out on the basis that, once operational, fishing vessels will be able to transit through the Morgan Array Area.

### 11.7 Measures adopted as part of the Morgan Generation Assets

11.7.1.1 For the purposes of the EIA process, the term ‘measures adopted as part of the project’ is used to include the following measures (adapted from IEMA, 2016):

- Measures included as part of the project design. These include modifications to location or design, integrated into the application for consent. These measures are implemented through the consent itself; through the requirements of the DCO or the conditions within the deemed marine licences/marine licence (referred to as primary mitigation in IEMA, 2016).
- Measures required to meet legislative requirements, or actions that are considered to be standard practice used to manage commonly occurring environmental effects (referred to as tertiary mitigation in IEMA, 2016).

11.7.1.2 A number of measures (primary and tertiary) have been adopted as part of the Morgan Generation Assets to reduce the potential for impacts on commercial fisheries (see Table 11.4).

11.7.1.3 As there is a commitment to implementing these measures, they are considered inherently part of the design of the Morgan Generation Assets and have, therefore, been considered in the assessment presented in section 11.8 below (i.e. the determination of magnitude and, therefore, significance, assumes implementation of these measures).

**Table 11.14: Measures adopted as part of the Morgan Generation Assets.**

Measures adopted as part of the Morgan Generation Assets	Justification	How the measure will be secured
<b>Primary measures: Measures included as part of the project design</b>		
Cable protection shall be designed to minimise snagging hazards as far as possible, for example by minimising height above seabed, smooth and shallower profiles, grade used for rock placement, type of rock (e.g. smoother edges).	To ensure safety of fishing activity and to minimise the amount of fishing grounds lost.	Will be committed to within the project design (see volume 1, section 3: Project description of the ES) and the cable installation plan secured through the marine licence.
Optimal foundation/wind turbine spacing and cable alignment to increase potential for co-existence (whilst also considering other key aspects, such as ground conditions, wind yield and environmental constraints).	To seek to design the array layout to increase potential for co-existence.	Will be committed to within the project design (see volume 1, section 3: Project description of the ES). Wind turbine spacing will be a parameter secured in the DCO.
<b>Tertiary measures: Measures required to meet legislative requirements or actions that are considered to be standard practice</b>		
Ongoing liaison with the fishing industry through the CFLO and Fishing Industry Representative (FIR) and adhere to good practice guidance with regards to fisheries liaison.	To maintain effective communications between the project and the fishing industry.	This will be committed to within the Fisheries Co-existence and Liaison Plan. Proposed to be secured through a condition in the marine licence.
Development of a Fisheries Co-existence and Liaison Plan.	To communicate the commitments by the Morgan Generation Assets to coexist with the fishing industry.	Proposed to be secured through a condition in the marine licence.
Advance warning to fishing fleets of construction, maintenance and decommissioning activities.	To ensure that the fishing industry is fully informed in advance of any offshore activities.	This will be committed to within the Fisheries Co-existence and Liaison Plan. Proposed to be secured through a condition in the marine licence.
Timely and efficient distribution of Notices to Mariners (NtMs).	To ensure that the fishing industry is fully informed in advance of any offshore activities.	This will be committed to within the Fisheries Co-existence and Liaison Plan. Proposed to be secured through a condition in the marine licence.
Use of advisory clearance distances and safety zones during construction and periods of major maintenance.	To ensure navigational safety and minimise risk of gear snagging.	Advisory clearance distances will be committed to within the Fisheries Co-existence and Liaison Plan. Proposed to be secured through a condition in the marine licence.  Formal safety zones will be applied for via a formal safety zone application.

Measures adopted as part of the Morgan Generation Assets	Justification	How the measure will be secured
Adequate navigational markers (including lighting), in accordance with the most recent relevant industry guidance.	To ensure navigational safety and minimise risk of gear snagging.	Committed with the project design (see volume 1, section 3: Project description of the PEIR) and the Aids to Navigation Management Plan. Proposed to be secured through a condition in the marine licence.
Development of a cable burial plan, to outline cable burial depth, cable protection and monitoring of inter-array and interconnector cables.	To ensure navigational safety and minimise risk of gear snagging.	Proposed to be secured through a condition in the marine licence.
Development of a dropped objects plan.	To ensure navigational safety and minimise risk of gear snagging.	Proposed to be secured through a condition in the marine licence.
Development of a decommissioning plan.	To ensure navigational safety and minimise risk of gear snagging.	Proposed to be secured through a condition in the marine licence.
Use of rolling construction zones.	To avoid the entire offshore Morgan Array Area being closed to fishing vessels during the construction phase.	Rolling construction zones will be committed to within the Fisheries Co-existence and Liaison Plan. Proposed to be secured through a condition in the marine licence.
Use of guard vessels where required	To ensure navigational safety and minimise risk of gear snagging.	This will be committed to within the Fisheries Co-existence and Liaison Plan. Proposed to be secured through a condition in the marine licence.

## 11.8 Assessment of significant effects

11.8.1.1 The potential impacts on commercial fisheries of the construction, operations and maintenance, and decommissioning phases of the Morgan Generation Assets have been assessed. The potential impacts arising from these different phases of the Morgan Generation Assets are listed in Table 11.12, along with the MDS against which each potential impact has been assessed.

11.8.1.2 A description of the potential significance of effect on commercial fisheries receptors caused by each identified impact is provided below. Due to the seasonality of activities of the different fishing fleets, the impacts are presumed to occur during the peak activity periods for each receptor group.

### 11.8.2 Loss or restricted access to fishing grounds

11.8.2.1 The construction, operations and maintenance, and decommissioning phases of the Morgan Generation Assets may lead to loss or restricted access to fishing grounds.

11.8.2.2 The MDS is represented by the maximum number of advisory safety zones around infrastructure and installation vessels during construction and decommissioning, and by the maximum amount of infrastructure during the operations and maintenance

phase plus any additional, temporary safety zones around vessels undertaking major maintenance works.

#### Construction phase

11.8.2.3 During construction of the Morgan Generation Assets, it is proposed that temporary 500m safety zones will be present around wind turbines and OSPs where works are underway. It is proposed that rolling advisory exclusion zones of 500m will also be present around vessels installing inter-array cables, interconnector cables and subtidal export cables. The loss or restricted access to fishing grounds created by such exclusion zones will be gradual as the presence of infrastructure increases. Temporary restrictions to fishing activity and/or anchoring, will also be required in areas where full cable burial to target depth has not yet been achieved and/or surface-laid cable exists (prior to cover by external cable protection). In such areas of temporarily shallow-buried/surface-laid cable, the restricted areas will be monitored by Guard Vessels.

11.8.2.4 Construction of the Morgan Generation Assets will also involve seabed preparation activities, comprising sandwave and boulder clearance for wind turbines, OSP, inter-array cables and interconnector cables.

11.8.2.5 A description of the significance of effect upon commercial fisheries receptors as a result of this potential impact is given below.

#### Magnitude of impact

##### Offshore static gear vessels

11.8.2.6 Offshore static gear vessels are active across the commercial fisheries study area, including the area where the Morgan Generation Assets are located (the Morgan Array Area). Project-specific consultation has established that these are predominantly English vessels targeting crab and whelk. VMS data indicates that there is a large spatial extent of fishing effort by offshore static gear vessels (>15m vessels) within the commercial fisheries study area. VMS data also indicates that within the Morgan Array Area, static gear activity (>15m vessels) was concentrated within the southeast part, between 2016 to 2020, with higher densities observed between 2018 to 2020.

11.8.2.7 This receptor group will be affected by construction works at the Morgan Array Area, with the construction phase having an anticipated duration of up to four years (including seabed preparation); however, during this period, fishing activity will only be excluded from discrete spatial areas (i.e. only discrete sections of the Morgan Array Area will be subject to temporary restrictions at any one time, via temporary 500m safety zones around major installation vessels). This limited area and period of exclusion is assessed as resulting in a loss of between 5-20% of the annual value of landings, for vessels within this receptor group.

11.8.2.8 In light of the above, the impact is predicted to be of local spatial extent, short to medium term duration (i.e. less than four years), intermittent, and with high reversibility due to the temporary nature of the works. It is predicted that the impact will affect the receptor directly, but be of low magnitude, as it is judged that construction would only affect an area from which a minor proportion of the receptor group's commercial annual value of landings is caught. The magnitude of impact for this receptor is therefore considered to be **low**.

### Beam trawl vessels

- 11.8.2.9 Project-specific consultation established approximately one English and six Belgian beam trawl vessels operating within the commercial fisheries study area, including the Morgan Array Area. Only the English beam trawl vessel operates within the Morgan Array Area. This is at a relatively low level and generally only within the northeast section of the Morgan Array Area and during the Spring period. Whilst operating within the commercial fisheries study area, the Belgian beam trawl vessels mostly trawl east of the Morgan Array Area predominantly targeting sole and plaice. All of these vessels fish within the wider Irish Sea, and not only within the commercial fisheries study area, highlighting their nomadic nature.
- 11.8.2.10 This receptor group will be affected by construction works at the Morgan Array Area (duration of up to four years, including seabed preparation). Although this receptor group is active within the Morgan Array Area, fishing activity will only be excluded from discrete spatial areas (i.e. only discrete sections of the Morgan Array Area will be subject to temporary restrictions at any one time, via temporary 500m safety zones around major installation vessels). Loss of, or restricted access to, fishing grounds during the construction phase is, therefore, assessed to have a predicted loss of <5% of this receptor's annual value of landings.
- 11.8.2.11 In light of the above, the impact is predicted to be of local spatial extent, short to medium term duration (i.e. less than four years), intermittent, and with high reversibility due to the temporary nature of the works. It is predicted that the impact will affect the receptor directly, but be of negligible magnitude, as it is judged construction would only affect an area from which a very small proportion of the receptor group's commercial annual value of landings is caught. The magnitude of impact for this receptor is, therefore, considered to be **negligible**.

### Scallop vessels – Scottish west coast

- 11.8.2.12 Landing statistics indicate that the commercial fisheries study area was important to Scottish west coast scallopers during the period 2010 to 2020, with 11 scallop vessels based in Annan, Ballantrae and Kirkcudbright active. Through close liaison with stakeholders (SFF, SWFPA and WCSP), project-specific consultation established that, although queen scallop populations are present throughout the Morgan Array Area, the west section of the Morgan Array Area is considered to be the most important ground; with August to December being particularly important months. These vessels also target king scallop within the Morgan Array Area, with November to May being a key period within the year.
- 11.8.2.13 This receptor group will be affected by construction works at the Morgan Array Area (duration of up to four years, including seabed preparation). During the construction phase, fishing activity will only be excluded from discrete spatial areas (i.e. only sections of the Morgan Array Area will be subject to temporary restrictions, via temporary 500m safety and/or exclusion zones around major installation vessels). This limited area of exclusion for fishing activity is assessed as resulting in a loss of between 5-20% of the annual value of landings for vessels in this receptor group.
- 11.8.2.14 In light of the above, the impact is predicted to be of local spatial extent, short to medium term duration (i.e. less than four years), intermittent, and with high reversibility due to the temporary nature of the works. It is predicted that the impact will affect the receptor directly, but be of low magnitude, as it is judged that construction would only

affect an area from which a minor proportion of the receptor group's commercial annual value of landings is caught. The magnitude of impact for this receptor is therefore considered to be **low**.

### Scallop vessels – Isle of Man

- 11.8.2.15 Feedback from project-specific consultation has established that, at the time of writing, there are 33 scallop vessels registered in the Isle of Man (the majority of these vessels have a licence for both king and queen scallop); however, 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 12nm limit and are, therefore, unlikely to fish within the Morgan Array Area due to the distance offshore from the Isle of Man. Fisheries monitoring has recorded 2 Manx vessels large enough to fish outside of the Manx territorial sea. Landing statistics (2010 to 2020) indicate that Isle of Man scallop vessels almost exclusively operate within ICES Rectangle 37E5, with effort in 36E5 recorded to a lesser degree, however activity only relates to small areas in the northwest and southwest of the Morgan Array Area, respectively. Analysis of VMS data (illustrating activity by otter trawl (>12m)) also confirmed relatively low levels of activity by this fishery within the west section of the Morgan Array Area within the study period (2009 to 2020).
- 11.8.2.16 This receptor group will be affected by construction works at the Morgan Array Area (duration of up to four years, including seabed preparation). When considering the above, and the fact that fishing activity for this receptor would only be excluded from discrete spatial areas during the construction phase (i.e. only sections of the Morgan Array Area will be subject to temporary 500m safety/exclusion zone restrictions), loss or restricted access to fishing grounds is assessed as representing between 5-20% of the annual value of landings for vessels within this receptor group.
- 11.8.2.17 In light of the above, the impact is predicted to be of local spatial extent, short to medium term duration (i.e. less than four years), intermittent, and with high reversibility due to the temporary nature of the works. It is predicted that the impact will affect the receptor directly, but be of low magnitude, as it is judged construction would only affect an area from which a minor proportion of the receptor group's commercial annual value of landings is caught. The magnitude of impact for this receptor is, therefore, considered to be **low**.

### Other scallop vessels

- 11.8.2.18 Feedback, via detailed consultation with fisheries stakeholders and analyses of official datasets, indicates that this receptor group predominantly constitutes vessels from the Republic of Ireland and Northern Ireland, plus a small number of more nomadic vessels from Wales and southwest England. While landing statistics indicate the relative importance of scallop within the commercial fisheries study area, remote monitoring has established that these vessels are highly nomadic, often passing through the Morgan Array Area in transit to fish other areas of the Irish Sea. These vessels also target scallop across a relatively wide area offshore.
- 11.8.2.19 This receptor group will be affected by construction works at the Morgan Array Area (duration of up to four years, including seabed preparation). Fishing activity would only be excluded from discrete spatial areas during the construction phase. Loss or

- restricted access to fishing grounds during construction is, therefore, assessed as representing <5% of the annual value of landings for this receptor group.
- 11.8.2.20 In light of the above, the impact is predicted to be of local spatial extent, short to medium term duration (i.e. less than four years), intermittent, and with high reversibility due to the temporary nature of the works. It is predicted that the impact will affect the receptor directly, but be of negligible magnitude, as it is judged construction would only affect an area from which a very small proportion of the receptor group's commercial annual value of landings is caught. The magnitude of impact for this receptor is, therefore, considered to be **negligible**.
- Herring vessels**
- 11.8.2.21 Feedback from project-specific consultation has established that, at the time of writing, the herring fishery in the region is comprised of three pelagic trawlers from Northern Ireland and two from England. Landings statistics indicate that within the commercial fisheries study area, this receptor group almost exclusively operates within ICES Rectangle 37E5, in which a relatively small, northwest section of the Morgan Array Area is located. The Douglas Bank herring fishery, positioned within ICES Rectangle 37E5, overlaps with the northwest section of the Morgan Array Area; and is subject to annual closure between 21 September and 15 November. Landings statistics indicate that August and September are the most important months for the herring fishery.
- 11.8.2.22 This receptor group will be affected by construction works at the Morgan Array Area (duration of up to four years, including seabed preparation). During the construction phase, fishing activity will only be excluded from discrete spatial areas (i.e. only sections of the Morgan Array Area will be subject to temporary restrictions, via temporary 500m safety and/or exclusion zones around major installation vessels). In light of this, the extent of the Morgan Array Area positioned within ICES Rectangle 37E5, and the relatively short time period in which this fishery is active (August to September) within the commercial fisheries study area, loss or restricted access to fishing grounds during construction is assessed as representing <5% of the annual value of landings for this receptor group.
- 11.8.2.23 The impact is predicted to be of local spatial extent, short to medium term duration (i.e. less than four years), intermittent, and with high reversibility due to the temporary nature of the works. It is predicted that the impact will affect the receptor directly, but be of negligible magnitude, as it is judged construction would only affect an area from which a very small proportion of the receptor group's annual value of landings is caught. The magnitude of impact for this receptor is, therefore, considered to be **negligible**.
- Sensitivity of the receptor**
- Offshore static gear vessels**
- 11.8.2.24 This commercial fisheries receptor comprises larger offshore vessels (>12m) that deploy static gear within the wider Irish Sea. VMS data identified that these vessels have been observed within various areas of the commercial fisheries study area and are active within the southwest of the Morgan Array Area. This receptor group has the ability to fish a wider area than any areas they may be temporarily excluded from during construction works.
- 11.8.2.25 Offshore static gear vessels are deemed to be of high spatial adaptability, moderate spatial tolerance and moderate recoverability. The sensitivity of the receptor is, therefore, considered to be **low**.
- Beam trawl vessels**
- 11.8.2.26 This commercial fisheries receptor group generally constitutes larger beam trawl vessels (>12m) from Belgium and the south coast of England that are active within the commercial fisheries study area. The baseline review process established that only the south coast vessels operate within the Morgan Array Area at a relatively low level, and generally only within the northeast section during the Spring period. Despite effort within the northeast section being observed to a relatively low degree, this activity occurs relatively consistently throughout the study period (2009 to 2020). This receptor group has the ability to fish numerous grounds within the wider Irish Sea and beyond.
- 11.8.2.27 Beam trawl vessels are deemed to be of high spatial adaptability, high spatial tolerance and high recoverability. The sensitivity of the receptor is, therefore, considered to be **negligible**.
- Scallop vessels – Scottish west coast**
- 11.8.2.28 This commercial fisheries receptor group generally constitutes larger vessels (>12m) from the Scottish west coast, deploying dredge gear and targeting queen and king scallop. Although vessels within this receptor group exhibit a relatively high operational range, they possess limited spatial tolerance, due to their high dependence upon the commercial fisheries study area for the dredging of queen scallop. The Scottish west coast scallop vessels also have a limited ability to deploy alternative gear.
- 11.8.2.29 Scottish west coast scallop vessels are deemed to be of high spatial adaptability, limited spatial tolerance and limited recoverability. The sensitivity of the receptor is therefore, considered to be **medium**.
- Scallop vessels – Isle of Man**
- 11.8.2.30 Within the commercial fisheries study area, according to landing statistics during the study period (2010 to 2020), this receptor group almost exclusively operates out of ICES Rectangles 37E5 and 36E5, with effort recorded within the west section of the Morgan Array Area. Therefore, this receptor group is assessed to exhibit moderate spatial adaptability. Project-specific consultation indicates that vessels within this receptor group are dedicated scallop vessels, with limited ability to deploy alternative gear. The Isle of Man Government administers a robust Scallop long-term management plan (LTMP) within its territorial waters; access to the fishery is predominantly restricted to vessels registered to the Isle of Man.
- 11.8.2.31 Isle of Man scallop vessels are deemed to be of moderate spatial adaptability, high spatial tolerance and moderate recoverability. The sensitivity of the receptor is therefore, considered to be **low**.

**Other scallop vessels**

11.8.2.32 As discussed, this receptor group comprises nomadic scallop vessels, that are often observed transiting through the Morgan Array Area to other parts of the wider Irish Sea. The receptor group exhibits an extensive operational range and is able to mitigate loss or restricted access to fishing grounds through its spatial tolerance.

11.8.2.33 Other scallop vessels are deemed to be of high spatial adaptability, high spatial tolerance and high recoverability. The sensitivity of this receptor is, therefore, considered to be **negligible**.

**Herring vessels**

11.8.2.34 As discussed, this receptor group comprises vessels from England and Northern Ireland, that target herring through deploying pelagic trawls and seines. Within the commercial fisheries study area, this fishery almost exclusively operates out of ICES Rectangle 37E5, in which a relatively small, northwest section of the Morgan Array Area is positioned. The fishery runs from August to September annually (Figure 11.5), while the herring start to aggregate prior to spawning (Duncan and Emmerson, 2018). This receptor group operates within the commercial fisheries study area for only a relatively short duration and is likely to operate across numerous other fishing grounds throughout the remainder of the year. The receptor group exhibits an extensive operational range and possesses an ability to target other pelagic species through deployment of alternative gear. This is likely to mitigate loss or restricted access to fishing grounds during construction of the Morgan Generation Assets.

11.8.2.35 Herring vessels are deemed to be of high spatial adaptability, moderate spatial tolerance, and high recoverability. The sensitivity of this receptor is, therefore, considered to be **low**.

**Significance of the effect**

11.8.2.36 A summary of the impact magnitude, sensitivity of receptors and overall effect significance is provided in Table 11.15.

**Table 11.15: Magnitude, sensitivity and impact significance relating to loss or restricted access to fishing grounds during construction of the Morgan Generation Assets.**

Receptor Group	Magnitude	Sensitivity	Significance
Offshore static gear vessels	Low	Low	Negligible
Beam trawl vessels	Negligible	Negligible	Negligible
Scottish west coast scallop vessels	Low	Medium	Minor
Isle of man scallop vessels	Low	Low	Negligible
Other scallop vessels	Negligible	Negligible	Negligible
Herring vessels	Negligible	Low	Negligible

**Operations and maintenance phase**

11.8.2.37 During the operations and maintenance phase of the Morgan Generation Assets, commercial fishing activity may be affected via long-term loss or restricted access to fishing grounds, and the associated reduction in revenue. This impact is dependent on the location of the receptor’s fishing grounds, and also the spatial extent of potential fishing grounds lost.

**Magnitude of impact**

11.8.2.38 Existing UK legislation does not prohibit commercial fishing within operational offshore wind farms and for many sites that have fixed foundation options (e.g. monopiles, jackets – three legged, jackets – four legged, suction bucket three-legged jacket and suction bucket four-legged jacket), commercial fishing has continued during this phase. For example, towed demersal fishing has occurred within the Walney 4 Extension Wind Farm since it has been operational, which could be partly attributed to layout of the wind turbines which facilitates vessels to safely fish within the boundary of the wind farm (Dunkley and Solandt, 2022). A study investigating the impact of the Westernmost Rough Offshore Wind Farm on commercial crustacean stock within its array area found that offshore static gear vessels were able to fish between wind turbines (spacing of 1,100m) and, therefore, continue their activity within the array during the operations and maintenance phase (Roach and Cohen, 2015). Post construction fish surveys undertaken on Westernmost Rough Offshore Wind Farm highlighted that landings per unit effort were consistent with pre-construction surveys and catches per unit effort of lobsters increased post-construction (Roach et al., 2022). Post construction fish surveys undertaken on the Barrow Offshore Wind Farm demonstrated that it is feasible to tow beam trawl gear between the wind turbines of the wind farm (Gray et al., 2016). Remote monitoring of fishing activity has confirmed that mobile gear vessels fish within operational wind farms in the Irish Sea.

11.8.2.39 The potential maximum number of wind turbines within the Morgan Array Area is 107, while the minimum spacing between rows of wind turbines is 1,000m. During project-specific consultation, information was provided by commercial fisheries stakeholders with regard to their preference of minimum spacing between wind turbines that would allow for continued fishing within the Morgan Array Area, as summarised within the magnitude section below. Different preferences for minimum spacing are attributable to different attitudes to risk, as well as different operating requirements associated with gear width when actively fishing.

11.8.2.40 Measures adopted as part of the Morgan Generation Assets, as outlined in Table 11.4 will minimise the impact of the loss, or restricted access to, fishing grounds during the operations and maintenance phase. A dedicated FLO will communicate timings and location of any maintenance works with the commercial fishing industry.

11.8.2.41 A number of fleets from the UK and other nationalities operate within the commercial fisheries study area. The impact is predicted to be of local to regional spatial extent, of relevance to international fishing fleets, and of long-term duration, as it will directly affect fleets across the 35-year design life of the Morgan Generation Assets.

**Offshore static gear vessels**

11.8.2.42 During project-specific consultation, this receptor group confirmed that they would fish within operational arrays, for example they fish within both Walney and Burbo Bank

- offshore wind farms. However, these static gear vessels would lay gear in a north - south alignment within the Morgan Array Area, which is the only orientation possible due to tides in the region; if wind turbines were set out in this layout, this receptor group would be able to fish between 1km spaced turbines. A study investigating the impact of the Westernmost Rough Offshore Wind Farm on commercial crustacean stock within its array area found that offshore static gear vessels were able to fish between wind turbines (spacing of 1,100m) and, therefore, continue their activity within the Array Area during the operations and maintenance phase (Roach and Cohen, 2015).
- 11.8.2.43 This receptor group will lose access to discrete areas as a result of project infrastructure: up to 107 turbines, with a seabed footprint of 524,300m<sup>2</sup> (inclusive of scour protection); up to four OSPs with a seabed footprint of 24,964m<sup>2</sup> (inclusive of scour protection). Due to the nature of the fishing gear, this receptor group is not expected to be affected by the cable protection and cable crossings.
- 11.8.2.44 Presuming that fishing by this receptor group could continue within the Morgan Array Area, the loss or restricted access to fishing grounds is, therefore, assessed as representing <5% of the annual value of landings for vessels in this receptor group.
- 11.8.2.45 In light of the above, the impact is predicted to be of local spatial extent, long term duration, intermittent, and with high reversibility due to the temporary nature of maintenance works. It is predicted that the impact will affect the receptor directly, but be of negligible magnitude, as it is judged that it would affect an area from which a very small proportion of the receptor group's annual value of landings is caught. The magnitude of impact for this receptor is, therefore, considered to be **negligible**.
- Beam trawl vessels**
- 11.8.2.46 The presence of the Morgan Generation Assets within the Morgan Array Area is expected to restrict the baseline operation of this receptor group (this does not apply for Belgian beam trawl vessels which have confirmed they do not actively fish within the Morgan Array Area). Project-specific consultation established that the minimum spacing of wind turbines, outlined in the MDS table (minimum spacing of 1,000m between rows of wind turbines), would allow beam trawl vessels from the South Coast of England to continue trawling within the Morgan Array Area. Project-specific consultation also established that these vessels fish within the wider Irish Sea, and not only within the Morgan Array Area. The baseline review process established that these vessels operate within the Morgan Array Area at a relatively low level, and generally only within the northeast section during the Spring period. It is important to note, however, that this activity within the Morgan Array Area has been observed at a relatively consistent level across the study period (2009 to 2020). Higher levels of fishing activity have been observed in areas outside the Morgan Array Area, to the east; and also to the southwest, south of the Isle of Man.
- 11.8.2.47 This receptor group will lose access to discrete areas as a result of project infrastructure: up to 107 turbines, with a seabed footprint of 524,300m<sup>2</sup> (inclusive of scour protection); up to four OSPs with a seabed footprint of 24,964m<sup>2</sup> (inclusive of scour protection). Due to the nature of the fishing gear (e.g. limited bottom contact with use of the SumWing), this receptor group is not expected to be affected by the cable protection and cable crossings.
- 11.8.2.48 Presuming that fishing by this receptor group could continue within the Morgan Array Area, the loss or restricted access to fishing grounds is, therefore, assessed as representing <5% of the annual value of landings for vessels in this receptor group.
- 11.8.2.49 In light of the above, the impact is predicted to be of local spatial extent, long term duration, intermittent, and with high reversibility due to the temporary nature of any maintenance works. It is predicted that the impact will affect the receptor directly, but be of negligible magnitude, as it is judged construction would only affect an area from which a very small proportion of the receptor group's commercial annual value of landings is caught. The magnitude of impact for this receptor is, therefore, considered to be **negligible**.
- Scallop vessels – Scottish west coast**
- 11.8.2.50 The west section of the Morgan Array Area is located within established queen scallop grounds, on which this receptor group is highly reliant (as described above for the construction phase). The presence of the Morgan Generation Assets within the Morgan Array Area is expected to restrict the operation of this scallop dredge fishery. Project-specific consultation established that the minimum spacing of wind turbines, outlined in the MDS table (minimum spacing of 1,000m between wind turbines), is lower than the preferred distance between wind turbines outlined by the Scottish west coast scallopers (2,800m to 3,700m). These scallop vessels tow gear in a north - south alignment within the Morgan Array Area, which is the only orientation possible due to tides in the region. Stakeholders also confirmed that gear penetration varied between 0.05-0.25m, so adequate burial of inter-array cables is important to allow these vessels to continue fishing within the Morgan Array Area; the MDS for burial depths of inter-array cables is 0.5m.
- 11.8.2.51 Based on the minimum spacing of 1,000m between rows of wind turbines, fishing could continue within the Morgan Array Area for this receptor group but would be restricted. This receptor group will also lose access to discrete areas as a result of project infrastructure: up to 107 turbines, with a seabed footprint of 524,300m<sup>2</sup> (inclusive of scour protection); up to four OSPs with a seabed footprint of 24,964m<sup>2</sup> (inclusive of scour protection); up to 50km of inter-array cable protection (up 3m height); up to 67 inter-array crossings (up to 4m height); up to 10km of interconnector cable protection (up 3m height); up to 10 interconnector crossings (up to 3m height). External cable protection will be designed to increase potential for coexistence.
- 11.8.2.52 Taking into account the reliance upon the west section of the Morgan Array Area for Queen scallops (potentially accounting for up to 40% of their total annual landings for Queen scallops (WCSP pers. comm.)), the operations and maintenance phase of the Morgan Array Area could lead to a reduction of 20-50% in annual landings.
- 11.8.2.53 In light of the above, the impact is predicted to be of regional spatial extent, long term duration, continuous, and with low reversibility. It is predicted that the impact will affect the receptor directly, and be of medium magnitude, as it is judged that it would affect an area from which a moderate proportion of the receptor group's annual value of landings is caught. The magnitude of impact for this receptor is, therefore, considered to be **medium**.

### Scallop vessels – Isle of Man

- 11.8.2.54 During project-specific consultation this receptor group indicated that they would fish within operational wind farms as the gear type used and vessel size facilitates sufficient manoeuvrability. They would, therefore, be able to continue fishing within the Morgan Array Area with the minimum spacing of 1,000m between rows of turbines.
- 11.8.2.55 This receptor group will lose access to discrete areas as a result of project infrastructure: up to 107 turbines, with a seabed footprint of 524,300m<sup>2</sup> (inclusive of scour protection); up to four OSPs with a seabed footprint of 24,964m<sup>2</sup> (inclusive of scour protection). Due to the nature of the fishing gear, this receptor group is not expected to be affected by the cable protection and cable crossings.
- 11.8.2.56 Based on the assumption that these vessels will continue to operate within the Morgan Array Area during the operations and maintenance phase, the area unsuitable for continued fishing (as a result of areas of project infrastructure) is assessed as representing <5% of the annual value of landings for vessels in this receptor group.
- 11.8.2.57 In light of the above, the impact is predicted to be of local spatial extent, long term duration, intermittent, and with high reversibility, due to the temporary nature of any maintenance works. It is predicted that the impact will affect the receptor directly, but be of negligible magnitude, as it is judged construction would only affect an area from which a very small proportion of the receptor group's commercial annual value of landings is caught. The magnitude of impact for this receptor is, therefore, considered to be **negligible**.

### Other scallop vessels

- 11.8.2.58 During project-specific consultation, this receptor group indicated that they would fish within operational wind farms and they would be able to continue fishing within the Morgan Array Area with the minimum spacing of 1,000m, although they highlighted concerns due to restricted operations between turbines.
- 11.8.2.59 This receptor group will also lose access to discrete areas as a result of project infrastructure: up to 107 turbines, with a seabed footprint of 524,300m<sup>2</sup> (inclusive of scour protection); up to four OSPs with a seabed footprint of 24,964m<sup>2</sup> (inclusive of scour protection); up to 50km of inter-array cable protection (up 3m height); up to 67 inter-array crossings (up to 4m height); up to 10km of interconnector cable protection (up 3m height); up to 10 interconnector crossings (up to 3m height). External cable protection will be designed to increase potential for coexistence.
- 11.8.2.60 Based on the assumption that these vessels will continue to operate within the Morgan Array Area during the operations and maintenance phase, the area unsuitable for continued dredging is assessed as only representing <5% of the annual value of landings for vessels in this receptor group.
- 11.8.2.61 In light of the above, the impact is predicted to be of local spatial extent, long term duration, intermittent, and with high reversibility due to the temporary nature of any maintenance works. It is predicted that the impact will affect the receptor directly, but be of negligible magnitude, as it is judged construction would only affect an area from which a very small proportion of the receptor group's commercial annual value of landings is caught. The magnitude of impact for this receptor is, therefore, considered to be **negligible**.

### Herring vessels

- 11.8.2.62 The presence of the Morgan Generation Assets within the Morgan Array Area is expected to restrict the baseline operation of this receptor group. During project-specific consultation, this receptor group indicated that they would be able to continue fishing within the Morgan Array Area. Therefore during the operations and maintenance phase, the area unsuitable for continued fishing is assessed as only representing <5% of the annual value of landings for vessels in this receptor group.
- 11.8.2.63 This receptor group will lose access to discrete areas as a result of project infrastructure: up to 107 turbines, with a seabed footprint of 524,300m<sup>2</sup> (inclusive of scour protection); up to four OSPs with a seabed footprint of 24,964m<sup>2</sup> (inclusive of scour protection). Due to the nature of the fishing gear, this receptor group is not expected to be affected by the cable protection and cable crossings.
- 11.8.2.64 In light of the above, the impact is predicted to be of local spatial extent, long term duration, intermittent, and with high reversibility due to the temporary nature of any maintenance works. It is predicted that the impact will affect the receptor directly, but be of negligible magnitude, as it is judged construction would only affect an area from which a very small proportion of the receptor group's commercial annual value of landings is caught. The magnitude of impact for this receptor is, therefore, considered to be **negligible**.

### Sensitivity of receptor

#### Offshore static gear vessels

- 11.8.2.65 Offshore static gear vessels are deemed to be of high spatial adaptability, moderate spatial tolerance and moderate recoverability. The sensitivity of the receptor is, therefore, considered to be **low**.

#### Beam trawl vessels

- 11.8.2.66 Beam trawl vessels are deemed to be of high spatial adaptability, high spatial tolerance and high recoverability. The sensitivity of the receptor is, therefore, considered to be **negligible**.

#### Scallop vessels – Scottish west coast

- 11.8.2.67 As previously discussed, this receptor group has limited spatial tolerance due to significant dependence upon the commercial fisheries study area for queen scallop dredging. The Scottish west coast scallop vessels also have a limited ability to deploy alternative gear.
- 11.8.2.68 Scottish west coast scallop vessels are deemed to be of high spatial adaptability, limited spatial tolerance and limited recoverability. The sensitivity of the receptor is therefore, considered to be **medium**.

#### Scallop vessels – Isle of Man

- 11.8.2.69 Isle of man scallop vessels are deemed to be of moderate spatial adaptability, high spatial tolerance and moderate recoverability, The sensitivity of this receptor is, therefore, considered to be **low**.



### Other scallop vessels

11.8.2.1 As discussed, this receptor group comprises nomadic scallop vessels that are often observed transiting through the Morgan Array Area to other parts of the wider Irish Sea. The receptor group exhibits an extensive operational range and is able to mitigate loss or restricted access to fishing grounds through their spatial tolerance.

11.8.2.2 Other scallop vessels are deemed to be of high spatial adaptability, high spatial tolerance and high recoverability. The sensitivity of this receptor is, therefore, considered **negligible**.

### Herring vessels

11.8.2.3 As discussed, this receptor group operates within the commercial fisheries study area for only a relatively short duration (August to September) and is likely to operate out of numerous other fishing grounds throughout the remaining year. The receptor group exhibits an extensive operational range, and possesses an ability to target other pelagic species, through deployment of alternative gear.

11.8.2.4 Herring vessels are deemed to be of high spatial adaptability, moderate spatial tolerance and high recoverability. The sensitivity of this receptor is, therefore, considered to be **low**.

### Significance of effect

11.8.2.5 A summary of the impact magnitude, sensitivity of receptors and overall effect significance is provided in Table 11.16.

**Table 11.16: Magnitude, sensitivity and impact significance relating to loss or restricted access to fishing grounds during the operations and maintenance phase of the Morgan Generation Assets.**

Receptor Group	Magnitude	Sensitivity	Significance
Offshore static gear vessels	Negligible	Low	Negligible
Beam trawl vessels	Negligible	Negligible	Negligible
Scottish west coast scallop vessels	Medium	Medium	Moderate
Isle of man scallop vessels	Negligible	Low	Negligible
Other scallop vessels	Negligible	Negligible	Negligible
Herring vessels	Negligible	Low	Negligible

### Further mitigation and residual effects

11.8.2.6 A moderate adverse effect is predicted on the Scottish west coast scallop vessels receptor, which is significant in terms of the EIA Regulations. In order to mitigate this effect on the Scottish west coast scallop fleet, options to increase the minimum distance between wind turbines and options to align the turbines with orientations of fishing tows are being explored by the Applicant that could allow for continued scallop dredging activity within the Morgan Array Area, thus increasing the potential for coexistence.

11.8.2.7 With these commitments to implement mitigation measures, which will be fully captured in the environmental statement submitted at Application, the impact magnitude is predicted to reduce to minor and the residual effect will be of **minor adverse** significance, which is not significant in EIA terms.

### Decommissioning phase

#### Magnitude of impact

11.8.2.8 The magnitude of the receptor groups remains the same as described for the construction phase of this impact and is summarised in Table 11.17.

#### Sensitivity of receptor

11.8.2.9 The sensitivity of the receptor groups remains the same as described for the construction phase of this impact and is summarised in Table 11.17.

#### Significance of effect

11.8.2.10 A summary of the impact magnitude, sensitivity of receptors and overall effect significance is provided in Table 11.17.

**Table 11.17: Magnitude, sensitivity and impact significance relating to loss or restricted access to fishing grounds during decommissioning of the Morgan Generation Assets.**

Receptor Group	Magnitude	Sensitivity	Significance
Offshore static gear vessels	Negligible	Low	Negligible
Beam trawl vessels	Negligible	Negligible	Negligible
Scottish west coast scallop vessels	Low	Medium	Minor
Isle of man scallop vessels	Low	Low	Negligible
Other scallop vessels	Negligible	Negligible	Negligible
Herring vessels	Negligible	Low	Negligible

### 11.8.3 Displacement of fishing activity into other areas

11.8.3.1 The construction, operations and maintenance, and decommissioning phases of the Morgan Generation Assets may lead to displacement of fishing activity into other areas, as a result of loss or restricted access to fishing grounds. This displacement can create potential adverse effects on existing fisheries in the areas that vessels are displaced into.

11.8.3.2 The MDS is represented by the maximum number of advisory safety zones around infrastructure and installation vessels during construction and decommissioning, and by the maximum amount of infrastructure during operations and maintenance. The MDS is summarised in Table 11.12 and is the same as for the “Loss or restricted access to fishing grounds” impact.

	<b>Construction phase</b>		
	<b>Magnitude of impact</b>		
	<b>Offshore static gear vessels</b>		
11.8.3.3	Displacement of mobile vessels deploying beam trawl and scallop dredges from the Morgan Array Area, into the areas where offshore static gear vessels set static gear (pots), could cause conflict between these different receptor groups. However, assuming that fishing will only be excluded within the 500m safety zones around major installation vessels, and that such displacement will be temporary and limited to discrete spatial areas at any one time, the extent of displacement is judged to be negligible. Displacement of fishing activity during construction is, therefore, predicted to result in a loss of <5% of this receptor's annual value of landings.	11.8.3.8	In light of the above, the impact is predicted to be of local spatial extent, short to medium term duration (i.e. less than four years), intermittent, and with high reversibility. It is predicted that the impact will affect the receptor directly, but be of negligible magnitude, as it is judged that it would only affect an area from which a very small proportion of the receptor group's annual value of landings is caught. The magnitude of impact for this receptor is, therefore, considered to be <b>negligible</b> .
11.8.3.4	In light of the above, the impact is predicted to be of local spatial extent, short to medium term duration (i.e. less than four years), intermittent, and with high reversibility due to the temporary nature of the works. It is predicted that the impact will affect the receptor directly, but be of negligible magnitude, as it is judged that it would only affect an area from which a very small proportion of the receptor group's annual value of landings is caught. The magnitude of impact for this receptor is, therefore, considered as <b>negligible</b> .		
	<b>Beam trawl vessels</b>		
11.8.3.5	Displacement of scallop vessels deploying dredges and offshore static gear deploying pots, from the Morgan Array Area into the areas where beam trawl vessels are active, could cause conflict between these different receptor groups. During construction, fishing activity will only be excluded from discrete spatial areas (i.e. only sections of the Morgan Array Area will be subject to temporary restrictions around major installation vessels). Therefore, in light of the temporary nature of the works and the short to medium term duration (i.e. less than four years), the displacement of fishing activity during construction results in a predicted loss of <5% of this receptor's annual value of landings.	11.8.3.9	<b>Scallop vessels – Isle of Man</b> Displacement of other fishing vessels from the Morgan Array Area into areas where Isle of Man scallop vessels fish could cause conflict between these different receptor groups. However, displacement of non-UK vessels, such as Belgian beam trawl vessels or Irish scallop vessels, into the Manx Territorial Sea (within 12nm) within ICES Rectangle 37E5 and 36E5 will not occur, as non-UK vessels do not have access to this area, under the London Fisheries Convention 1964. Displacement of Scottish west coast scallop vessels and other scallopers into the Manx Territorial Sea is also limited, as under the Isle of Man Scallop LTMP, access to king scallop dredging is limited to vessels under 221kW, unless they possess Grandfather Rights. These Grandfather Rights will be terminated by November 2024 under the LTMP. Only vessels which possess a UK and Isle of Man fishing vessel licence with scallop entitlement, may fish for scallops within Manx Territorial waters. In light of this, and the discrete spatial areas of exclusion during construction, the displacement of fishing activity during construction therefore results in a predicted loss of <5% of this receptor's annual value of landings
11.8.3.6	In light of the above, the impact is predicted to be of local spatial extent, short to medium term duration (i.e. less than four years), intermittent, and with high reversibility due to the temporary nature of the works. It is predicted that the impact will affect the receptor directly, but be of negligible magnitude, as it is judged that it would only affect an area from which a very small proportion of the receptor group's annual value of landings is caught. The magnitude of impact for this receptor is, therefore, considered to be <b>negligible</b> .	11.8.3.10	In light of the above, the impact is predicted to be of local spatial extent, short to medium term duration (i.e. less than four years), intermittent, and with high reversibility. It is predicted that the impact will affect the receptor directly, but be of negligible magnitude, as it is judged that it would only affect an area from which a very small proportion of the receptor group's annual value of landings is caught. The magnitude of impact for this receptor is, therefore, considered to be <b>negligible</b> .
	<b>Scallop vessels – Scottish west coast</b>		
11.8.3.7	Displacement of offshore static gear, beam trawl vessels and other scallop receptor gear from the Morgan Array Area into areas of Scottish west coast scallop activity could cause conflict between these different receptor groups. However, the extent of this displacement is judged to be limited due to fishing activity only being excluded from discrete spatial areas during the construction phase (i.e. around major installation vessels). The displacement of fishing activity during construction therefore results in a predicted loss of <5% of this receptor's annual value of landings.	11.8.3.11	<b>Other scallop vessels</b> Displacement of fishing activity into areas where other scallop vessels are active during construction is predicted to result in a loss of <5% of this receptor's annual value of landings, due to the highly nomadic nature of this receptor group and exclusion being limited to discrete areas.
		11.8.3.12	In light of the above, the impact is predicted to be of local spatial extent, short to medium term duration (i.e. less than four years), intermittent, and with high reversibility. It is predicted that the impact will affect the receptor directly, but be of negligible magnitude, as it is judged that construction would only affect an area from which a very small proportion of the receptor group's annual value of landings is caught. The magnitude of impact for this receptor is, therefore, considered to be <b>negligible</b> .
			<b>Herring vessels</b>
		11.8.3.1	Landing statistics indicate that the commercial fisheries study area was particularly important to vessels landing herring throughout the study period (2010 to 2020), with August and September being particularly important months. Landing statistics also

- indicate that within the commercial fisheries study area, this receptor group almost exclusively operates within ICES Rectangle 37E5, in which a relatively small, northwest section of the Morgan Array Area is positioned (an approximate total area within ICES Rectangle 37E5 of 11%, excluding the Isle of Man).
- 11.8.3.2 The majority of ICES Rectangle 37E5 is positioned within the Manx Territorial Sea (within 12nm), with the baseline review process having established that this receptor group is predominantly active within this inshore region. Displacement of non-UK fishing vessels, such as Belgian beam trawls, from the Morgan Generation Assets into other inshore areas within ICES Rectangle 37E5, is unlikely as non-UK vessels do not have access to this area under the London Fisheries Convention 1964. Displacement of Scottish west coast scallop vessels, and other scallopers, into the Manx Territorial Sea is also limited, as under the Isle of Man Scallop LTMP, access to king scallop dredging is limited to vessels under 221kW, unless they possess Grandfather Rights. These Grandfather Rights will be terminated by November 2024 under the LTMP. Only vessels which possess a UK and Isle of Man fishing vessel licence with scallop entitlement, may fish for scallops within Manx Territorial waters. Conflict between the Isle of Man scallop vessels and herring vessels receptor groups is possible; although this is limited by differing key periods of activity between the king scallop and herring fishery (section 11.4.4), and the discrete spatial areas of exclusion during construction. The displacement of fishing activity during construction, therefore, results in a predicted loss of <5% of this receptor's annual value of landings
- 11.8.3.3 The impact is predicted to be of local spatial extent, short to medium term duration (i.e. less than four years), intermittent, and with high reversibility. It is predicted that the impact will affect the receptor directly, but be of negligible magnitude, as it is judged that construction would only affect an area from which a very small proportion of the receptor group's annual value of landings is caught. The magnitude of impact for this receptor is, therefore, considered to be **negligible**.
- Norway Lobster (*Nephrops*) vessels**
- 11.8.3.4 While landing statistics indicate the relative importance of *Nephrops* within the commercial fisheries study area, remote monitoring, project-specific feedback and analysis of VMS data has established that these vessels mainly target the *Nephrops* grounds off the Cumbria coast (NW IFCA, 2022). These grounds are largely located within the English inshore region (within the 12nm boundary) and do not overlap with the Morgan Array Area. Vessels are predominantly from England, Northern Ireland and Scotland, as established by MMO and EU STECF landings data, and project-specific consultation.
- 11.8.3.5 The *Nephrops* grounds off the Cumbria coast are comprised of fine or silty mud that allow for *Nephrops* populations to thrive (NW IFCA, 2022). In contrast, king and queen scallop usually reside in firm sand, or fine or sandy gravel (MarLIN, 2022); thus, they are unlikely to be found in abundance within the *Nephrops* grounds of the Cumbria coast. This is also supported through analysis of VMS dredging data (2009 to 2020), where limited to no existing scallop dredging activity has been observed within the vicinity of the *Nephrops* grounds. Therefore, displacement of scallop dredging vessels from the Morgan Array Area into the *Nephrops* grounds is considered unlikely.
- 11.8.3.6 Similarly, beam trawls, targeting plaice, commonly occur over sandy sediment types, as opposed to muddy sediment, while commercial fishing of sole is usually limited to deeper offshore waters where sole tend to school in groups, which allow for catches on a commercial scale (NW IFCA, 2022). Non-UK vessels, such as the Belgian beam trawlers, do not have access to English inshore areas under the London Fisheries Convention 1964, with access, therefore, limiting displacement of this fishery into the *Nephrops* grounds.
- 11.8.3.7 Displacement of offshore static gear vessels from the Morgan Array Area into the *Nephrops* grounds of the Cumbria coast is considered possible. However, it is understood that a spatial 'gentleman's agreement' exists between the different gear types in operation within the commercial fisheries study area, and it is assumed that this would continue during the construction phase of the Morgan Generation Assets. Therefore, it is anticipated that displacement of offshore static gear vessels from the Morgan Array Area into the *Nephrops* grounds is not likely to occur.
- 11.8.3.8 On the basis of the above, and the discrete spatial areas of exclusion during construction, the displacement of fishing activity during construction, therefore, results in a predicted loss of between <5% of this receptor's annual value of landings
- 11.8.3.9 The impact is predicted to be of local spatial extent, short to medium term duration (i.e. less than four years), intermittent, and with high reversibility. It is predicted that the impact will affect the receptor directly, but be of negligible magnitude, as it is judged that construction would only affect an area from which a very small proportion of the receptor group's annual value of landings is caught. The magnitude of impact for this receptor is, therefore, considered to be **negligible**.
- Sensitivity of receptor**
- Offshore static gear vessels**
- 11.8.3.10 Displacement of mobile vessels, such as those that deploy beam trawls and dredges, into the areas where the offshore static gear vessels set pots could cause displacement of fishing activity for this receptor group. However, this receptor group has the ability to fish a wider area than those areas they may be temporarily excluded from during construction works.
- 11.8.3.11 Offshore static gear vessels are deemed to be of high spatial adaptability, moderate spatial tolerance and moderate recoverability. The sensitivity of the receptor is, therefore, considered to be **low**.
- Beam trawl vessels**
- 11.8.3.12 Beam trawl vessels exhibit extensive operational ranges and they have the ability to fish numerous grounds within the wider Irish Sea. Some Belgian beam trawl vessels that have been recorded within the commercial fisheries study area, have also been observed to deploy alternative gear types.
- 11.8.3.13 Beam trawl vessels are deemed to be of high spatial adaptability, high spatial tolerance and high recoverability. The sensitivity of the receptor is, therefore, considered to be **negligible**.
- Scallop vessels – Scottish west coast**
- 11.8.3.14 As previously discussed, this receptor group has limited spatial tolerance due to significant dependence upon the commercial fisheries study area for queen scallop

dredging. The Scottish west coast scallop vessels also have a limited ability to deploy alternative gear.

11.8.3.15 Scottish west coast scallop vessels are deemed to be of high spatial adaptability, limited spatial tolerance and limited recoverability. The sensitivity of the receptor is therefore, considered to be **medium**.

**Scallop vessels – Isle of Man**

11.8.3.16 Within the commercial fisheries study area, according to landing statistics, this receptor group almost exclusively operated out of ICES Rectangles 37E5 and 36E5 throughout the study period (2010 to 2020), and project-specific consultation indicates that the Isle of Man vessels are dedicated scallop vessels.

11.8.3.17 Isle of Man scallop vessels are deemed to be of moderate spatial adaptability, high spatial tolerance and moderate recoverability. The sensitivity of the receptor is, therefore, considered to be **low**.

**Other scallop vessels**

11.8.3.18 As discussed, this receptor group comprises nomadic scallop vessels that are often observed transiting through the Morgan Array Area to other parts of the wider Irish Sea. The receptor group exhibits an extensive operational range and is able to mitigate loss or restricted access to fishing grounds through their spatial tolerance.

11.8.3.19 Other scallop vessels are deemed to be of high spatial adaptability, high spatial tolerance and high recoverability. The sensitivity of this receptor is, therefore, considered to be **negligible**.

**Herring vessels**

11.8.3.20 As discussed, this receptor group operates within the commercial fisheries study area for only a relatively short duration (August to September) and is likely to operate across numerous other fishing grounds throughout the remaining year. The receptor group exhibits an extensive operational range and possesses an ability to target other pelagic species through deployment of alternative gear.

11.8.3.21 Herring vessels are deemed to be of high spatial adaptability, moderate spatial tolerance and high recoverability. The sensitivity of this receptor is, therefore, considered to be **low**.

**Norway lobster (*Nephrops*) vessels**

11.8.3.1 As discussed, this receptor group comprises vessels predominantly from England, Northern Ireland and Scotland, that deploy demersal trawls/seine and otter trawls to target *Nephrops*. The fishery predominantly targets the *Nephrops* grounds of the Cumbria coast (NW IFCA, 2022), which do not overlap with the Morgan Array Area. This receptor group possesses the ability to deploy alternative gear, that targets other demersal species.

11.8.3.2 *Nephrops* vessels are deemed to be of high spatial adaptability, high spatial tolerance and high recoverability. The sensitivity of this receptor is, therefore, considered to be **negligible**.

**Significance of effect**

11.8.3.3 A summary of the impact magnitude, sensitivity of receptors and overall effect significance is provided in Table 11.18.

**Table 11.18: Magnitude, sensitivity and impact significance relating to displacement of fishing activity into other areas during construction of the Morgan Generation Assets.**

Receptor Group	Magnitude	Sensitivity	Significance
Offshore static gear vessels	Negligible	Low	Negligible
Beam trawl vessels	Negligible	Negligible	Negligible
Scottish west coast scallop vessels	Negligible	Medium	Negligible
Isle of man scallop vessels	Negligible	Low	Negligible
Other scallop vessels	Negligible	Negligible	Negligible
Herring vessels	Negligible	Low	Negligible
Norway lobster ( <i>Nephrops</i> ) vessels	Negligible	Negligible	Negligible

**Operations and maintenance phase**

**Magnitude of impact**

**Offshore static gear vessels**

11.8.3.4 Displacement of mobile vessels deploying beam trawl and scallop dredges during the operations and maintenance phase from the Morgan Array Area, into the areas where offshore static gear vessels set pots, could cause conflict between these different receptor groups. However, it is noted that the other mobile gear receptor groups target a relatively large area in comparison to the Morgan Array Area. It is also currently understood that a spatial ‘gentleman’s agreement’ exists between the different gear types in operation in this area, as discussed during the construction phase, and it is assumed that this would continue during the operations and maintenance phase. Therefore, displacement of fishing activity during the operations and maintenance phase is predicted to result in a loss of <5% of this receptor’s annual value of landings.

11.8.3.5 In light of the above, the impact is predicted to be of local spatial extent, long term duration, intermittent, and with high reversibility. It is predicted that the impact will affect the receptor directly, but be of negligible magnitude, as it is judged that construction would only affect an area from which a very small proportion of the receptor group’s annual value of landings is caught. The magnitude of impact for this receptor is, therefore, considered to be **negligible**.

**Beam trawl vessels**

11.8.3.6 Project-specific consultation established that these vessels operate within the Morgan Array Area at a relatively low level, and generally only within the northeast section during the Spring period. While direct displacement caused by possible wind turbine

layout within the Morgan Array Area is minimal, as a result of their spatial preferences, displacement of other offshore vessels during the operations and maintenance phase, from the Morgan Array Area into areas where beam trawl vessels operate, could cause conflict between these different receptor groups. However, project-specific consultation established that these vessels fish within the wider Irish Sea, and not only within the Morgan Array Area, highlighting their nomadic nature and operational range. Displacement of fishing activity during the operations and maintenance phase, therefore, results in a predicted loss of <5% of this receptor's annual value of landings.

- 11.8.3.7 In light of the above, the impact is predicted to be of local spatial extent, long term duration, intermittent, and with high reversibility. It is predicted that the impact will affect the receptor directly, but be of negligible magnitude, as it is judged that construction would only affect an area from which a very small proportion of the receptor group's annual value of landings is caught. The magnitude of impact for this receptor is, therefore, considered to be **negligible**.

#### Scallop vessels – Scottish west coast

- 11.8.3.8 Displacement of offshore static gear, beam trawl vessels and other scallop receptor gear from the Morgan Array Area into areas of Scottish west coast scallop activity could cause conflict between these different receptor groups. However, it is noted that the other mobile gear receptor groups and offshore static gear vessels target a relatively large area in comparison to the Morgan Array Area. It is also currently understood that a spatial 'gentleman's agreement' exists between the different gear types in operation in this area and it is assumed that this would continue during the operational and maintenance phase. Therefore, displacement of fishing activity during the operational and maintenance phase results in a predicted loss of <5% of this receptor's annual value of landings.

- 11.8.3.9 In light of the above, the impact is predicted to be of regional spatial extent, long term duration, continuous, and with low reversibility. It is predicted that the impact will affect the receptor directly, but be of negligible magnitude, as it is judged that construction would only affect an area from which a very small proportion of the receptor group's annual value of landings is caught. The magnitude of impact is for this receptor is, therefore, considered to be **negligible**

#### Scallop vessels – Isle of Man

- 11.8.3.10 Displacement of other fishing vessels from the Morgan Array Area into areas where Isle of Man Scallop vessels fish could create conflict. However, as previously discussed, displacement of non-UK vessels, such as Belgian beam trawl vessels or Irish scallop vessels, into the Manx Territorial Sea (within 12nm), within Rectangles 37E5 and 36E5 will not happen, as non-UK vessels do not have access to this area, under the London Fisheries Convention 1964. Displacement of Scottish west coast scallop vessels, and other scallopers, into the Manx Territorial Sea is also limited, as under the Isle of Man Scallop LTMP, access to king scallop dredging is limited to vessels under 221kW, unless they possess Grandfather Rights. These Grandfather Rights will be terminated by November 2024 under the LTMP. Only vessels which possess a UK and Isle of Man fishing vessel licence with scallop entitlement may fish for scallops within Manx Territorial waters. The displacement of fishing activity during

the operations and maintenance phase, therefore, results in a predicted loss of <5% of this receptor's annual value of landings.

- 11.8.3.11 In light of the above, the impact is predicted to be of regional spatial extent, long term duration, continuous, and with low reversibility. It is predicted that the impact will affect the receptor directly, but be of negligible magnitude, as it is judged that construction would only affect an area from which a very small proportion of the receptor group's annual value of landings is caught. The magnitude of impact for this receptor is, therefore, considered to be **negligible**.

#### Other scallop vessels

- 11.8.3.12 Displacement, during the operations and maintenance phase, of fishing activity into areas where this receptor group is active, is predicted to result in a loss of <5% of this receptor's annual value of landings, due to the nomadic nature and relatively high operational range of the receptor.

- 11.8.3.13 In light of the above, the impact is predicted to be of regional spatial extent, long term duration, continuous, and with low reversibility. It is predicted that the impact will affect the receptor directly, but be of negligible magnitude, as it is judged that construction would only affect an area from which a very small proportion of the receptor group's annual value of landings is caught. The magnitude of impact for this receptor is, therefore, considered to be **negligible**.

#### Herring vessels

- 11.8.3.14 Landing statistics indicate that within the commercial fisheries study area, this receptor group almost exclusively operate within ICES Rectangle 37E5, in which a relatively small, northwest section of the Morgan Array Area is positioned (an approximate total area within ICES Rectangle 37E5 of 11%, excluding the Isle of Man); with August and September being particularly important months. The majority of ICES Rectangle 37E5 is positioned within the Manx Territorial Sea (within 12nm), with the baseline review process having established that this receptor group is predominantly active within this inshore region.

- 11.8.3.15 Displacement of non-UK fishing vessels, such as Belgian beam trawls, from the Morgan Array Area into other inshore areas within ICES Rectangle 37E5, is unlikely, as non-UK vessels do not have access to this area under the London Fisheries Convention 1964. Displacement of Scottish west coast scallop vessels, and other scallopers, into the Manx Territorial Sea is also limited, as under the Isle of Man Scallop LTMP, access to king scallop dredging is limited to vessels under 221kW, unless they possess Grandfather Rights. These Grandfather Rights will be terminated by November 2024 under the LTMP. Only vessels which possess a UK and Isle of Man fishing vessel licence with scallop entitlement, may fish for scallops within Manx Territorial waters. Conflict between the Isle of Man scallop vessels, and herring vessels receptor groups is possible; although, this is limited by differing key periods of activity between the king scallop and herring fishery (section 11.4.4). The displacement of fishing activity during the operations and maintenance phase, therefore, results in a predicted loss of <5% of this receptor's annual value of landings.

- 11.8.3.16 The impact is predicted to be of local to regional spatial extent, long term duration, continuous, and with low reversibility. It is predicted that the impact will affect the receptor directly, but be of negligible magnitude, as it is judged that it would affect an

area from which a very small proportion of the receptor group's annual value of landings is caught. The magnitude of impact for this receptor is, therefore, considered to be **negligible**.

**Norway Lobster (*Nephrops*) vessels**

11.8.3.17 Remote monitoring, project-specific feedback and analysis of VMS data has established that this receptor group predominantly targets the *Nephrops* grounds off the Cumbria coast (NW IFCA, 2022). These grounds are located predominantly within the English inshore region (within the 12nm boundary) and do not overlap with the Morgan Array Area.

11.8.3.18 As described during the construction phase of this impact, the *Nephrops* grounds of the Cumbria coast are comprised of fine or silty mud that is optimal for thriving *Nephrops* habitat (NW IFCA, 2022). In contrast, such sediment composition is suboptimal for king and queen scallop, and these are, therefore, unlikely to be found in abundance within the *Nephrops* grounds of the Cumbria coast. This is also supported through analysis of VMS dredging data (2009 to 2020), where limited to no existing scallop dredging activity has been observed within the vicinity of the *Nephrops* grounds. Therefore, displacement of scallop dredging vessels from the Morgan Array Area into the *Nephrops* grounds is considered unlikely.

11.8.3.19 Similarly, beam trawl targeted plaice are commonly found in sandy sediment types, as opposed to muddy sediment, and commercial fishing of sole is usually limited to deeper offshore waters, where sole tend to school in groups, which allows for catches on a commercial scale (NW IFCA, 2022). Non-UK vessels, such as the Belgian beam trawlers, do not have access to English inshore areas under the London Fisheries Convention 1964; therefore, limiting displacement of this fishery into the *Nephrops* grounds.

11.8.3.20 Displacement of offshore static gear vessels from the Morgan Array Area into the *Nephrops* grounds of the Cumbria coast is considered possible. However, it is currently understood that a spatial 'gentleman's agreement' exists between the different gear types in operation in this area, and it is assumed that this would continue during the operations and maintenance phase of the Morgan Generation Assets. Therefore, it is anticipated that displacement of offshore static gear vessels from the Morgan Array Area into the *Nephrops* groups is not likely to occur.

11.8.3.21 Therefore, the displacement of fishing activity during the operations and maintenance phase results in a predicted loss of between <5% of this receptor's annual value of landings.

11.8.3.22 The impact is predicted to be of local to regional spatial extent, long term duration, continuous, and with low reversibility. It is predicted that the impact will affect the receptor directly, but be of negligible magnitude, as it is judged that it would affect an area from which a very small proportion of the receptor group's annual value of landings is caught. The magnitude of impact for this receptor is, therefore, considered to be **negligible**.

**Sensitivity of receptor**

11.8.3.23 The sensitivity of the receptor groups remains the same as described for the construction phase of this impact and is summarised in Table 11.19.

**Significance of effect**

11.8.3.24 A summary of the impact magnitude, sensitivity of receptors and overall effect significance is provided in Table 11.19.

**Table 11.19: Magnitude, sensitivity and impact significance relating to displacement of fishing activity into other areas during the operations and maintenance phase of the Morgan Generation Assets.**

Receptor Group	Magnitude	Sensitivity	Significance
Offshore static gear vessels	Negligible	Low	Negligible
Beam trawl vessels	Negligible	Negligible	Negligible
Scottish west coast scallop vessels	Negligible	Medium	Negligible
Isle of man scallop vessels	Negligible	Low	Negligible
Other scallop vessels	Negligible	Negligible	Negligible
Herring vessels	Negligible	Low	Negligible
Norway lobster ( <i>Nephrops</i> ) vessels	Negligible	Negligible	Negligible

**Decommissioning phase**

**Magnitude of impact**

11.8.3.25 The sensitivity of the receptor groups remains the same as described for the construction phase of this impact and is summarised in Table 11.20.

**Sensitivity of receptor**

11.8.3.26 The sensitivity of the receptor groups remains the same as described for the construction phase of this impact and is summarised in Table 11.20.

**Significance of effect**

11.8.3.27 A summary of the impact magnitude, sensitivity of receptors and overall effect significance is provided in Table 11.20.

**Table 11.20: Magnitude, sensitivity and impact significance relating to displacement of fishing activity into other areas during decommissioning of the Morgan Generation Assets.**

Receptor Group	Magnitude	Sensitivity	Significance
Offshore static gear vessels	Negligible	Low	Negligible
Beam trawl vessels	Negligible	Negligible	Negligible
Scottish west coast scallop vessels	Negligible	Medium	Negligible
Isle of man scallop vessels	Negligible	Low	Negligible

Receptor Group	Magnitude	Sensitivity	Significance
Other scallop vessels	Negligible	Negligible	Negligible
Herring vessels	Negligible	Low	Negligible
Norway lobster ( <i>Nephrops</i> ) vessels	Negligible	Negligible	Negligible

## 11.8.4 Interference with fishing activity

11.8.4.1 The construction, operations and maintenance and decommissioning phases of the Morgan Array Area may lead to interference with fishing activity, as a result of increased vessel traffic caused by vessels associated with the Morgan Generation Assets or changes to shipping routes.

11.8.4.2 The MDS is represented by the maximum amount of infrastructure and number of vessel transits which could result in the greatest potential for interference and is summarised in Table 11.12. Full consideration of effects on commercial fishing vessels while transiting, for example collision and allision, is discussed in volume 2, chapter 12: Shipping and navigation of the PEIR.

### Construction phase

11.8.4.3 During the construction of the Morgan Generation Assets (duration of up to four years), there will be a total of 62 construction vessels on site at any one time. There will be up to 1,828 installation vessel movements (return trips) during construction.

### Magnitude of impact

11.8.4.4 Measures outlined in section 11.7 will minimise the impact of interference with fishing activity during construction of the Morgan Generation Assets. These include notifying the commercial fishing industry in advance of any offshore activities through Notices to Mariners, Kingfisher Bulletins and ongoing liaison by the CFLO and FIR.

11.8.4.5 Although construction vessel traffic will add to the existing level of shipping activity in the area, there are already moderate levels of vessel traffic that exist in the area and there is co-existence of fishing vessels with other marine traffic. Fishing vessels engaged in fishing must exhibit appropriate lighting; and have the right of way over most other marine traffic. Construction vessels in transit would also be fully compliant with the International Regulations for Preventing Collisions at Sea (COLREGS).

11.8.4.6 For all commercial fisheries receptor groups, the impact is predicted to be of local spatial extent, short to medium term duration, intermittent and high reversibility. It is predicted that the impact will affect the receptors directly, but be of low magnitude, as it is judged that construction would only affect an area from which a minor proportion of the receptor group's annual value of landings is caught. The magnitude of impact for this receptor is, therefore, considered to be **low** for all commercial fisheries receptor groups.

### Sensitivity of receptor

11.8.4.7 For this impact, the sensitivity has been defined by the vulnerability of the receptor group to potential interference with their fishing activity.

### Offshore static gear vessels

11.8.4.8 This commercial fisheries receptor comprises larger offshore vessels (>12 m) that deploy static gear and has high spatial adaptability due to the extent of its operational range. These vessels will be affected by construction vessels within the Morgan Array Area. The marker buoys deployed by the offshore static gear vessels are vulnerable to potential interference by construction vessels, due to their poor visibility. The offshore static gear vessels are deemed to be of medium vulnerability. The sensitivity of the receptor is therefore, considered to be **medium**.

### Beam trawl vessels

11.8.4.9 This commercial fisheries receptor group is constituted generally of larger beam trawl vessels (>12m) from the south coast of England and Belgium (although noted that Belgian beam trawl vessels have confirmed they do not actively fish within the Morgan Array Area); these vessels exhibit high spatial adaptability, due to extensive operational ranges. It is expected that these vessels will be in a position to avoid the Morgan Generation Assets construction vessels. Construction vessels in transit would be fully compliant with COLREGS, so would not pose a risk to towed fishing gear or require fishing vessels engaged in fishing to alter their course. The beam trawl vessels are deemed to be of negligible vulnerability. The sensitivity of the receptor is, therefore, considered to be **negligible**.

### Scallop vessels – Scottish west coast

11.8.4.10 This commercial fisheries receptor group is constituted generally of larger vessels (>12m) from the Scottish west coast. It is expected that these vessels will be in a position to avoid the Morgan Generation Assets construction vessels. Construction vessels in transit would be fully compliant with COLREGS, so would not pose a risk to towed fishing gear or require fishing vessels engaged in fishing to alter their course. These scallop vessels are deemed to be of negligible vulnerability. The sensitivity of the receptor is therefore, considered to be **negligible**.

### Scallop vessels – Isle of Man

11.8.4.11 This commercial fisheries receptor group is constituted generally of larger vessels (>10m) from the Isle of Man. It is expected that these vessels will be in a position to avoid the Morgan Generation Assets construction vessels. Construction vessels in transit would be fully compliant with COLREGS, so would not pose a risk to towed fishing gear or require fishing vessels engaged in fishing to alter their course. These scallop vessels are deemed to be of negligible vulnerability. The sensitivity of the receptor is therefore, considered to be **negligible**.

### Other scallop vessels

11.8.4.12 This receptor group comprises nomadic scallop vessels that are often observed transiting through the Morgan Array Area to other parts of the wider Irish Sea. This

commercial fisheries receptor group is constituted generally of larger vessels (>12m) from Ireland and Northern Ireland. It is expected that these vessels will be in a position to avoid the Morgan Generation Assets construction vessels. Construction vessels in transit would be fully compliant with COLREGS, so would not pose a risk to towed fishing gear or require fishing vessels engaged in fishing to alter their course. These scallop vessels are deemed to be of negligible vulnerability. The sensitivity of the receptor is therefore, considered to be **negligible**.

**Herring vessels**

11.8.4.13 This receptor group is comprised generally of larger vessels (>10m) that deploy pelagic trawls and seine nets and operate within the commercial fisheries study area for only a relatively short duration throughout the year (August to September). These vessels exhibit an extensive operational range, are likely to operate out of numerous other fishing grounds throughout the remaining year and possess an ability to target other pelagic species through deployment of alternative gear. Construction vessels in transit would be fully compliant with COLREGS, so would not pose a risk to towed fishing gear or require fishing vessels engaged in fishing to alter their course. These herring vessels are deemed to be of negligible vulnerability. The sensitivity of the receptor is therefore, considered to be **negligible**.

**Significance of effect**

11.8.4.14 A summary of the impact magnitude, sensitivity of receptors and overall effect significance is provided in Table 11.21.

**Table 11.21: Magnitude, sensitivity and impact significance relating to interference with fishing activity during construction of the Morgan Generation Assets.**

Receptor Group	Magnitude	Sensitivity	Significance
Offshore static gear vessels	Low	Medium	Minor
Beam trawl vessels	Low	Negligible	Negligible
Scottish west coast scallop vessels	Low	Negligible	Negligible
Isle of man scallop vessels	Low	Negligible	Negligible
Other scallop vessels	Low	Negligible	Negligible
Herring vessels	Low	Negligible	Negligible

**Operations and maintenance phase**

11.8.4.15 During the operations and maintenance phase of the Morgan Generation Assets there will be a total of 21 operation and maintenance vessels on site at any one time. There will be up to 2,351 operations and maintenance vessel movements (return trips) during operation.

**Magnitude of impact**

11.8.4.16 Measures outlined in section 11.7 will minimise the impact of interference with fishing activity during operations and maintenance of the Morgan Generation Assets. The commercial fishing industry will be fully informed in advance of any offshore activities through Notices to Mariners, Kingfisher Bulletins and ongoing liaison by the CFLO and FIR.

11.8.4.17 Although operations and maintenance vessel traffic will add to the existing level of shipping activity in the area, there are already moderate levels of vessel traffic in the area, and there is co-existence of fishing vessels with other marine traffic. Fishing vessels engaged in fishing must exhibit appropriate lighting and have the right of way over most other marine traffic. Operations and maintenance vessels in transit would also be fully compliant with COLREGS.

11.8.4.18 For all commercial fisheries receptor groups, the impact is predicted to be of local spatial extent, long term duration, intermittent and high reversibility. It is predicted that the impact will affect the receptors directly, but be of low magnitude, as it is judged that it would affect an area from which a minor proportion of the receptor group's annual value of landings is caught. The magnitude of impact for this receptor is, therefore, considered to be **low** for all commercial fisheries receptor groups, as summarised in Table 11.22.

**Sensitivity of receptor**

11.8.4.19 The sensitivity of the receptor groups remains the same as described for the construction phase of this impact and is summarised in Table 11.22.

**Significance of effect**

11.8.4.20 A summary of the impact magnitude, sensitivity of receptors and overall effect significance is provided in Table 11.22.

**Table 11.22: Magnitude, sensitivity and impact significance relating to interference with fishing activity during the operations and maintenance phase of the Morgan Generation Assets.**

Receptor Group	Magnitude	Sensitivity	Significance
Offshore static gear vessels	Low	Medium	Minor
Beam trawl vessels	Low	Negligible	Negligible
Scottish west coast scallop vessels	Low	Negligible	Negligible
Isle of man scallop vessels	Low	Negligible	Negligible
Other scallop vessels	Low	Negligible	Negligible
Herring vessels	Low	Negligible	Negligible



### Decommissioning phase

11.8.4.21 During the decommissioning phase the changes would gradually decrease from the operational MDS as the need for project-related vessels is reduced.

#### Magnitude of impact

11.8.4.22 It is anticipated that the magnitude for interference with fishing activity will be similar to that of the construction phase and is summarised in Table 11.23.

#### Sensitivity of receptor

11.8.4.23 The sensitivity of all commercial fisheries receptors during decommissioning is deemed to be the same as for the construction phase and is summarised in Table 11.23.

#### Significance of effect

11.8.4.24 A summary of the impact magnitude, sensitivity of receptors and overall effect significance is provided in Table 11.23.

**Table 11.23: Magnitude, sensitivity and impact significance relating interference with fishing activity during decommissioning of the Morgan Generation Assets.**

Receptor Group	Magnitude	Sensitivity	Significance
Offshore static gear vessels	Low	Medium	Minor
Beam trawl vessels	Low	Negligible	Negligible
Scottish west coast scallop vessels	Low	Negligible	Negligible
Isle of man scallop vessels	Low	Negligible	Negligible
Other scallop vessels	Low	Negligible	Negligible
Herring vessels	Low	Negligible	Negligible

### 11.8.5 Temporary increase in steaming distances

11.8.5.1 The construction and decommissioning phases of the Morgan Array Area may lead to increased steaming times and distances for commercial fishing vessels, which could increase operational costs. This impact has been scoped out for the operations and maintenance phase of the Morgan Array Area as fishing vessels will be able to transit through the Morgan Array Area to/from adjacent fishing grounds during the operations and maintenance phase (see section 11.6.2).

11.8.5.2 The MDS is represented by the maximum number of advisory safety zones around infrastructure and installation vessels during construction and decommissioning and is summarised in Table 11.12. Full consideration of effects on commercial fishing vessels while transiting, for example collision and allision, is discussed in volume 2, chapter 12: Shipping and navigation of the PEIR.

### Construction phase

11.8.5.3 There will be 500m safety zones around wind turbines and OSPs during their construction. There will also be a 50m safety zone around each item of infrastructure during the construction phase when no construction works are taking place on that infrastructure (for example, where a wind turbine is incomplete or is in the process of being tested before commissioning). Rolling advisory safety zones of 500m will be in place around vessels installing inter-array cables and interconnector cables.

#### Magnitude of impact

11.8.5.4 Measures outlined in section 11.7 will minimise the impact of any increased steaming distances during construction. The commercial fishing industry will be fully informed in advance of any offshore activities through Notices to Mariners, Kingfisher Bulletins and ongoing liaison by the CFLO and FIR.

11.8.5.5 It is anticipated that transiting fishing vessels will only be required to take minor deviations, as impacts will be localised to the immediate area of construction and construction vessels, with the use of rolling construction zones.

11.8.5.6 The impact is predicted to be of local extent, short to medium term duration, intermittent and high reversibility. It is predicted that the impact will affect the receptor directly. The magnitude for this receptor is, therefore, considered to be **negligible** for all commercial fisheries receptor groups.

#### Sensitivity of receptor

11.8.5.7 All commercial fisheries receptor groups have operational ranges that are beyond that of the areas of construction, so have the ability to make deviations to transit routes. Providing that adequate notification is given, these fishing vessels will be in a position to avoid construction areas, with limited impact upon steaming times.

11.8.5.8 All commercial fisheries receptor groups are deemed to be of low vulnerability, high spatial adaptability, high spatial tolerance and moderate recoverability to this impact. The sensitivity of all commercial fisheries receptors is, therefore, considered to be **low**.

#### Significance of effect

11.8.5.9 A summary of the impact magnitude, sensitivity of receptors and overall effect significance is provided in Table 11.24.

**Table 11.24: Magnitude, sensitivity and impact significance relating to temporary increase in steaming distances during construction of the Morgan Generation Assets.**

Receptor Group	Magnitude	Sensitivity	Significance
Offshore static gear vessels	Negligible	Low	Negligible
Beam trawl vessels	Negligible	Low	Negligible
Scottish west coast scallop vessels	Negligible	Low	Negligible
Isle of man scallop vessels	Negligible	Low	Negligible
Other scallop vessels	Negligible	Low	Negligible

Receptor Group	Magnitude	Sensitivity	Significance
Herring vessels	Negligible	Low	Negligible

### Decommissioning phase

#### Magnitude of impact

11.8.5.10 It is anticipated that the magnitude of impact for increases in steaming distances in the decommissioning phase will be no greater than the same impact during the construction phase. The magnitude for this receptor is therefore, considered to be **negligible** for all commercial fisheries receptor groups.

#### Sensitivity of receptor

11.8.5.11 The sensitivity of all commercial fisheries receptors to this particular impact during decommissioning is deemed to be the same as for the construction phase. The sensitivity of all commercial fisheries receptors is therefore, considered to be **low**.

#### Significance of effect

11.8.5.12 A summary of the impact magnitude, sensitivity of receptors and overall effect significance is provided in Table 11.25.

**Table 11.25: Magnitude, sensitivity and impact significance relating to temporary increase in steaming distances during decommissioning of the Morgan Generation Assets.**

Receptor Group	Magnitude	Sensitivity	Significance
Offshore static gear vessels	Negligible	Low	Negligible
Beam trawl vessels	Negligible	Low	Negligible
Scottish west coast scallop vessels	Negligible	Low	Negligible
Isle of man scallop vessels	Negligible	Low	Negligible
Other scallop vessels	Negligible	Low	Negligible
Herring vessels	Negligible	Low	Negligible

### 11.8.6 Loss or damage to fishing gear due to snagging

11.8.6.1 The construction, operations and maintenance and decommissioning of the Morgan Generation Assets may lead to loss or damage to fishing gear due to snagging. Snagging risks may occur as a result of infrastructure on the seabed, such as inter-array cables and associated cable protection.

11.8.6.2 The MDS is represented by the maximum amount of infrastructure associated with the project and is summarised in Table 11.12. Safety risk for fishing vessels associated with potential gear snagging is assessed in volume 2, chapter 12: Shipping and navigation of the PEIR.

### Construction phase

11.8.6.3 The progressive installation of infrastructure during the construction phase of the Morgan Generation Assets would result in an increased potential for snagging risks to fishing vessels. These include risks associated with sub-surface infrastructure such as partially laid/surface-laid cables.

#### Magnitude of impact

11.8.6.4 Measures outlined in section 11.7 will minimise the risks of snagging during construction. The commercial fishing industry will be fully informed of any potential snagging risks through Notices to Mariners, Kingfisher Bulletins and ongoing liaison by the CFLO and FIR. Use of advisory clearance distances and safety zones will minimise the risk of interaction between fishing vessels and project infrastructure, therefore reducing the risk of snagging. Where required, snagging risks such as surface-laid cable that has not yet had external cable protection applied or secondary burial works undertaken, will be marked by a guard vessel or navigational marker.

#### Offshore static gear vessels

11.8.6.5 This receptor group will be affected by construction works within the Morgan Array Area. As previously discussed for this receptor group, VMS data indicates relatively high levels of offshore static fishing gear within the Morgan Array Area, particularly in the southeast. Based on this, and on the proposed measures adopted as part of the Morgan Generation Assets and the commitments to follow standard protocols, loss or damage to fishing gear due to snagging in the construction phase is assessed to have a predicted loss of <5% of this receptor's annual landings.

11.8.6.6 In light of the above, the impact is predicted to be of local spatial extent, short to medium term duration (i.e. less than four years), intermittent and with high reversibility due to the temporary nature of the works. It is predicted that the impact will affect the receptor directly. The magnitude of impact for this receptor group is, therefore, considered to be **negligible**.

#### Beam trawl vessels

11.8.6.7 This receptor group will be affected by construction works within the Morgan Generation Assets. Project-specific consultation established that these vessels fish within the wider Irish Sea and not only within the commercial fisheries study area, highlighting their nomadic nature. The baseline review process established that these vessels operate within the Morgan Array Area at a relatively low level, and generally only within the northeast section during the Spring period. Based on this, and on the proposed measures adopted as part of the Morgan Generation Assets, and the commitments to follow standard protocols, loss or damage to fishing gear due to snagging in the construction phase is assessed to have a predicted loss of <5% of this receptor's annual landings.

11.8.6.8 In light of the above, the impact is predicted to be of local spatial extent, short to medium term duration (i.e. less than four years), intermittent and with high reversibility due to the temporary nature of the works. It is predicted that the impact will affect the receptor directly. The magnitude of impact for this receptor group is, therefore, considered to be **negligible**.

### Scallop vessels – Scottish west coast

- 11.8.6.9 This receptor group will be affected by construction works within the Morgan Generation Assets. Through close liaison with stakeholders (SFF, SWFPA and WCSP), project-specific consultation has established that Scottish west coast scallop vessels are active and rely heavily upon a west section of the Morgan Array Area for the dredging of queen scallop with August to December being particularly important months. These vessels also target king scallop within the Morgan Generation Assets with November to May being a key period within the year for this. However, based on the proposed measures adopted as part of the Morgan Generation Assets, and the commitments to follow standard protocols, loss or damage to fishing gear due to snagging during the construction phase is assessed to have a predicted loss of <5% of this receptor's annual landings.
- 11.8.6.10 In light of the above, the impact is predicted to be of local spatial extent, short to medium term duration (i.e. less than four years), intermittent and with high reversibility due to the temporary nature of the works. It is predicted that the impact will affect the receptor directly. The magnitude of impact for this receptor group is, therefore, considered to be **negligible**.

### Scallop vessels – Isle of Man

- 11.8.6.11 This receptor group will be affected by construction works within the Morgan Generation Assets. As previously discussed for this receptor group, landing statistics indicate that Isle of Man scallop vessels almost exclusively operate out of Rectangles 37E5 and 36E5, with effort in 36E5 recorded to a lesser degree. Fisheries monitoring has, to date, recorded 2 Manx vessels large enough to fish outside of the Manx 12nm. Based on this, and on the proposed measures adopted as part of the Morgan Generation Assets and the commitments to follow standard protocols, loss or damage to fishing gear due to snagging in the construction phase is assessed to have a predicted loss of <5% of this receptor's annual landings.
- 11.8.6.12 In light of the above, the impact is predicted to be of local spatial extent, short to medium term duration (i.e. less than four years), intermittent and with high reversibility due to the temporary nature of the works. It is predicted that the impact will affect the receptor directly. The magnitude of impact for this receptor group is, therefore, considered to be **negligible**.

### Other scallop vessels

- 11.8.6.13 This receptor group will be affected by construction works within the Morgan Generation Assets. While landing statistics indicate relative importance for scallop within the commercial fisheries study, remote monitoring has established that these vessels are highly nomadic, often pass through the Morgan Array Area in transit to fish other areas of the Irish Sea, and target scallop across a relatively wide area offshore. Based on this, and on the proposed measures adopted as part of the Morgan Generation Assets and the commitments to follow standard protocols, loss or damage to fishing gear due to snagging in the construction phase is assessed to have a predicted loss of <5% of this receptor's annual landings.
- 11.8.6.14 In light of the above, the impact is predicted to be of local spatial extent, short to medium term duration (i.e. less than four years), intermittent and with high reversibility due to the temporary nature of the works. It is predicted that the impact will affect the

receptor directly. The magnitude of impact for this receptor group is, therefore, considered to be **negligible**.

### Herring vessels

- 11.8.6.15 This receptor group will be affected by construction works within the Morgan Generation Assets. As previously discussed, landing statistics indicate that this receptor group almost exclusively operates out of ICES Rectangle 37E5, in which a relatively small, northwest section of the Morgan Array Area is positioned. Landings are highest during August and September. Feedback from project-specific consultation has established that, at the time of writing, the fishery is constituted of three pelagic trawlers from Northern Ireland, and two from England.
- 11.8.6.16 In light of the above, the impact is predicted to be of local spatial extent, short to medium term duration (i.e. less than four years), intermittent and with high reversibility due to the temporary nature of the works. It is predicted that the impact will affect the receptor directly. The magnitude of impact for this receptor group is, therefore, considered to be **negligible**.

### Sensitivity of receptor

- 11.8.6.17 For this impact, the sensitivity has been defined by the vulnerability of the receptor group associated with snagging risks.

### Offshore static gear vessels

- 11.8.6.18 This receptor group, comprising generally larger offshore vessels (>12m), demonstrates high spatial adaptability and has the ability to fish a wider area than any areas that are subject to potential loss or damage to fishing gear due to snagging during construction works. The nature of static gear fishing, where gear is not towed and does not penetrate the seabed, means that the vulnerability of these receptor groups is low. It is acknowledged, however, that snagging still poses a risk to static gear vessels, for example when hauling gear. The sensitivity of the receptor is, therefore, considered to be **low**.

### Beam trawl vessels

- 11.8.6.19 This receptor group exhibits high spatial adaptability, due to extensive operational ranges and has the ability to fish numerous grounds within the wider Irish Sea and beyond; this receptor group therefore has the ability to fish a wider area than any areas that are subject to potential loss or damage to fishing gear due to snagging during construction works. Some Belgian beam trawl vessels that have been recorded within the commercial fisheries study area have also been observed to deploy alternative gear types.
- 11.8.6.20 The nature of the gear deployed means that the vulnerability of this receptor group is medium, as the method of fishing by mobile gear vessels, means that vessels need to tow nets/trawls under significant power, and at defined speeds. The sensitivity of the receptor is, therefore, considered to be **medium**.

**Scallop vessels – Scottish west coast**

- 11.8.6.21 Although vessels within this receptor group exhibit a relatively high operational range, they possess limited spatial tolerance due to their high dependence upon the commercial fisheries study area for queen scallop dredging. The Scottish west coast scallop vessels also have a limited ability to deploy alternative gear.
- 11.8.6.22 During consultation, this receptor group clarified that penetration of gear varied between 0.05-0.25m. The nature of the gear deployed means that the vulnerability of this receptor group is high, and the method of fishing by scallop dredgers, means that vessels need to tow nets/trawls under significant power, and at defined speeds. The sensitivity of the receptor is, therefore, considered to be **high**.

**Scallop vessels – Isle of Man**

- 11.8.6.23 This receptor group almost exclusively operates out of ICES Rectangles 37E5 and 36E5 and, therefore, exhibits moderate spatial adaptability. Project-specific consultation indicates that vessels within this receptor group are dedicated scallop vessels, with limited ability to deploy alternative gear.
- 11.8.6.24 During consultation, fisheries stakeholders provided information on penetration depths of gear and requested a minimum burial depth of 1.5m; penetration of gear depended on the gear type, with otter trawl gear and queen scallop dredge gear penetrating less than king scallop dredge gear. The nature of the gear deployed means that the vulnerability of this receptor group is medium, as the method of fishing by mobile gear vessels, means that vessels need to tow nets/trawls under significant power, and at defined speeds. The sensitivity of this receptor is, therefore, considered to be **medium**.

**Other scallop vessels**

- 11.8.6.25 As discussed, this receptor group comprises nomadic scallop vessels that are often observed transiting through the Morgan Array Area to other parts of the wider Irish Sea. The receptor group exhibits an extensive operational range and has the ability to fish a wider area than any areas that are subject to potential loss or damage to fishing gear due to snagging during construction works.
- 11.8.6.26 The nature of the gear deployed, means that the vulnerability of this receptor group is medium, as the method of fishing by mobile gear vessels, means that vessels need to tow nets/trawls under significant power, and at defined speeds. The sensitivity of this receptor is, therefore, considered to be **medium**.

**Herring vessels**

- 11.8.6.27 As discussed, this receptor group comprises vessels that target herring from England and Northern Ireland, deploying pelagic trawls and seines. Within the commercial fisheries study area, this fishery almost exclusively operates out of ICES Rectangle 37E5, in which a relatively small, northwest section of the Morgan Array Area is positioned.
- 11.8.6.28 The nature of the gear deployed means that the vulnerability of this receptor group is negligible, as these vessels are mostly using pelagic trawls and seines which have

no, or minimal, contact with the seabed. The sensitivity of the receptor is, therefore, considered to be **negligible**.

**Significance of effect**

- 11.8.6.29 A summary of the impact magnitude, sensitivity of receptors and overall effect significance is provided in Table 11.26.

**Table 11.26: Magnitude, sensitivity and impact significance relating to loss or damage to fishing gear due to snagging during construction of the Morgan Generation Assets.**

Receptor Group	Magnitude	Sensitivity	Significance
Offshore static gear vessels	Negligible	Low	Negligible
Beam trawl vessels	Negligible	Medium	Negligible
Scottish west coast scallop vessels	Negligible	High	Minor
Isle of man scallop vessels	Negligible	Medium	Negligible
Other scallop vessels	Negligible	Medium	Negligible
Herring vessels	Negligible	Negligible	Negligible

**Operations and maintenance phase**

- 11.8.6.30 During the operations and maintenance phase of the Morgan Generation Assets, cables will be buried (where possible) to a minimum depth of 0.5m, however potential exists for inter-array cables and interconnector cables to become shallow-buried or exposed due to changes in seabed conditions. Associated external cable protection could also present a snagging risk to fishing vessels:
- 11.8.6.31 Up to 10% of the inter-array cables (up to 50km) may require external cable protection and up to 20% of the interconnectors (up to 10km) may also require external cable protection. There will be a maximum of 67 inter-array cable crossings and up to 10 interconnector crossings, all of which will likely require external cable protection. Scour protection could also extend up to 21m from each wind turbine structure to a height of 2.5m above seabed level.

**Magnitude of impact**

- 11.8.6.32 Measures outlined in section 11.7 will minimise the risks of snagging during operations and maintenance.
- 11.8.6.33 Cables will be buried, where possible, to a minimum of 0.5m to reduce the risk of snagging. If appropriate burial depth cannot be achieved, external cable protection may be required, the locations of which would be communicated to all commercial fisheries groups.
- 11.8.6.34 Cable protection shall be designed to minimise snagging hazards as far as possible, for example by minimising height above seabed, smooth and shallower profiles, grade used for rock placement, type of rock (e.g. smoother edges).

11.8.6.35 Project infrastructure, including the ‘as-laid’ coordinates of the inter-array and interconnector cables, shall be recorded and submitted to the United Kingdom Hydrographic Office (UKHO) and Kingfisher for inclusion on charts. The commercial fishing industry will be fully informed of any potential snagging risks through Notices to Mariners, Kingfisher Bulletins and ongoing liaison by the CFLO and FIR. Use of advisory clearance distances and safety zones during major maintenance periods will minimise the risk of interaction between fishing vessels and project infrastructure, therefore reducing the risk of snagging. Where it is deemed necessary, snagging risks will be marked by a guard vessel or navigational marker.

11.8.6.36 Based on the proposed measures adopted as part of the Morgan Generation Assets, and the commitments to follow standard protocols, it is anticipated that the magnitude for loss or damage to fishing gear due to snagging will be similar to that of the construction phase. This is summarised in Table 11.27.

**Sensitivity of receptor**

11.8.6.37 The sensitivity of the receptor groups remains the same as described for the construction phase of this impact, as summarised in Table 11.27.

**Significance of effect**

11.8.6.1 A summary of the impact magnitude, sensitivity of receptors and overall effect significance is provided in Table 11.27.

**Table 11.27: Magnitude, sensitivity and impact significance relating to loss or damage to fishing gear due to snagging during the operations and maintenance phase of the Morgan Generation Assets.**

Receptor Group	Magnitude	Sensitivity	Significance
Offshore static gear vessels	Negligible	Low	Negligible
Beam trawl vessels	Negligible	Medium	Negligible
Scottish west coast scallop vessels	Negligible	High	Minor
Isle of man scallop vessels	Negligible	Medium	Negligible
Other scallop vessels	Negligible	Medium	Negligible
Herring vessels	Negligible	Negligible	Negligible

**Decommissioning phase**

**Magnitude of impact**

11.8.6.2 It is anticipated that the magnitude for loss or damage to fishing gear due to snagging will be the same, and likely less than for the construction phase, as summarised in Table 11.28.

**Sensitivity of receptor**

11.8.6.3 The sensitivity of all commercial fisheries receptors during decommissioning is deemed to be the same as for the construction phase, as summarised in Table 11.28.

**Significance of effect**

11.8.6.4 A summary of the impact magnitude, sensitivity of receptors and overall effect significance is provided in Table 11.28.

**Table 11.28: Magnitude, sensitivity and impact significance relating to loss or damage to fishing gear due to snagging during decommissioning of the Morgan Generation Assets.**

Receptor Group	Magnitude	Sensitivity	Significance
Offshore static gear vessels	Negligible	Low	Negligible
Beam trawl vessels	Negligible	Medium	Negligible
Scottish west coast scallop vessels	Negligible	High	Minor
Isle of man scallop vessels	Negligible	Medium	Negligible
Other scallop vessels	Negligible	Medium	Negligible
Herring vessels	Negligible	Negligible	Negligible

**11.8.7 Potential impacts on commercially important fish and shellfish resources**

11.8.7.1 The following potential impacts on fish and shellfish ecology via the construction, operations and maintenance, and decommissioning phases of the Morgan Generation Assets have been identified:

- Temporary habitat loss/disturbance
- Underwater noise creating injury and/or disturbance (construction phase only)
- Increased suspended sediment concentrations (SSCs) and associated sediment deposition
- Long-term habitat loss
- Electromagnetic Fields (EMFs) from subsea electrical cabling (operations and maintenance phase only)
- Colonisation of hard structures
- Injury due to increased risk of collision with vessels.

11.8.7.2 These potential impacts on fish and shellfish ecology are assessed within volume 2, chapter 8: Fish and Shellfish Ecology of the PEIR. The Morgan fish and shellfish ecology study area covers the east Irish Sea, extending from MHWS west from the Mull of Galloway in Scotland to the western tip of Anglesey, following the territorial waters / 12nm limit of the Isle of Man.

11.8.7.3 As discussed in volume 6, annex 11.1: Commercial fisheries technical report of the PEIR and Table 11.7, the following species are of commercial importance within the commercial fisheries study area and are, therefore, the focus of this assessment:

- Queen scallop
- King scallop
- Herring
- Lobster
- Norway lobster (*Nephrops*)
- Sole
- Plaice
- Whelk.

11.8.7.4 Injury due to increased risk of collision with vessels has only been assessed for basking sharks and is therefore not considered within this chapter.

#### Construction phase

11.8.7.5 There is potential for the construction phase to result in both adverse and/or beneficial effects on commercially important fish and shellfish populations. Adverse effects include behavioural changes or increases/declines in abundance, which could, therefore, potentially affect the commercial fisheries which target those species.

11.8.7.6 The fish and shellfish ecology assessment concluded that for all impacts during the construction phase of the Morgan Generation Assets, the effect will be of minor adverse significance for king and queen scallops, which is not significant in EIA terms. Therefore, no significant impact is predicted for the Scottish west coast, Isle of Man and other scallop vessels receptor groups.

11.8.7.7 The fish and shellfish ecology assessment concluded that for all impacts during the construction phase of the Morgan Generation Assets, the effect will be of minor adverse significance for European lobster and *Nephrops*, which is not significant in EIA terms. Therefore, no significant impact is predicted for offshore static gear vessels.

11.8.7.8 The fish and shellfish ecology assessment concluded that for all impacts during the construction phase of the Morgan Generation Assets, the effect will be of minor adverse significance for herring, which is not significant in EIA terms. Therefore, no significant impact is predicted for herring vessels. However, the assessment concluded that there is potential for residual risk of significant effects on herring spawning if piling occurs during the spawning season, due to the close proximity of the Morgan Generation Assets to the nearby herring spawning grounds. Measures to minimise the risk of significant effects on herring spawning are currently being investigated and will be discussed with relevant stakeholders and included in the Environmental Statement.

11.8.7.9 The fish and shellfish ecology assessment concluded that for the majority of impacts during the construction phase of the Morgan Generation Assets, the effect will be of minor adverse significance for other marine species (e.g. sole and plaice), which is not significant in EIA terms. Therefore, no significant impact is predicted for the beam

trawl vessels receptor groups, who predominantly target sole and plaice as well as other, demersal species.

#### Operations and maintenance phase

11.8.7.10 There is potential for the operations and maintenance phase to result in adverse and/or beneficial effects on commercially important fish and shellfish populations. Adverse effects include behavioural changes or increases/declines in abundance, which could, therefore, potentially affect the commercial fisheries which target those species.

11.8.7.11 Overall, the fish and shellfish ecology assessment concluded that the significance of effect during the operational and maintenance phase remains the same or less in comparison to the construction phase for all impacts. Therefore, no significant impact is predicted for any commercial fisheries receptor groups as a result of impacts on commercially important fish and shellfish resources.

11.8.7.12 EMFs from subsea electrical cables was only considered for the operations and maintenance phase and concluded that the significance of EMFs from subsea electrical cabling during the operational and maintenance phase is minor adverse for all species.

11.8.7.13 Therefore, no significant impacts are predicted for any commercial fisheries receptor groups during the operations and maintenance phase, as a result of impacts on commercially important fish and shellfish resources.

#### Decommissioning phase

11.8.7.14 The significance of effect for each commercially important species assessed within the fish and shellfish ecology assessment is expected to remain the same, if not less than, as described during the construction phase above for each impact. The potential impacts are, therefore, not expected to exceed **minor adverse** significance, which is not significant in EIA terms.

11.8.7.15 In light of the above, no significant impact is predicated for each of the seven identified commercial fisheries receptor groups in Table 11.7 during the decommissioning phase.

### 11.8.8 Supply chain opportunities for local fishing vessels

11.8.8.1 The construction, operations and maintenance and decommissioning of the Morgan Generation Assets may lead to supply chain opportunities for local fishing vessels. The MDS is summarised in Table 11.12.

#### Construction phase

11.8.8.2 During the construction phase (up to four years duration) of the Morgan Generation Assets, the following are areas of potential support that could be provided by local commercial fishing operators:

- Guard vessels
- Scouting surveys
- Visual checks of infrastructure

- OFLO duties.

**Magnitude of impact**

11.8.8.3 Due to this impact being beneficial, the definition for magnitude has been amended to align with the terms for beneficial impacts that are outlined in Table 5.4 of volume 1, chapter 5: EIA methodology of the PEIR.

11.8.8.4 For all receptor groups, this impact is predicted to be of local spatial extent, short to medium term duration (i.e. less than four years) and intermittent. It is predicted that the impact will affect the receptor directly, but only be of minor benefit, as it is judged that any such support by this receptor group would create a value equivalent to between 5-20% of the receptor group’s annual value of landings. The magnitude is therefore, considered to be **low**.

**Sensitivity of receptor**

11.8.8.5 For this impact, the sensitivity has been defined by the likely potential that the receptor group has, for providing support to the Morgan Generation Assets.

**Offshore static gear vessels**

11.8.8.6 These vessels have moderate suitability to provide marine operational support during the construction phase. This is based on the vessels being larger, and therefore having larger operational ranges and capacity to provide support, in addition to the assumption that vessels have the relevant workboat certifications for the vessel and crew. Multiple vessels from this receptor group have provided support as scout vessels during initial offshore surveys. The sensitivity of the receptor is, therefore, considered to be **medium**.

**Beam trawl vessels**

11.8.8.7 These vessels do not have the suitability to provide marine operational support during the construction phase. Although these vessels are larger, and therefore have larger operational ranges, they are not suitable for providing support work due to poor stability without their derricks in operational position. The sensitivity of the receptor is, therefore, considered to be **negligible**.

**Scallop vessels – Scottish west coast**

11.8.8.8 These vessels have low suitability to provide marine operational support during the construction phase; these vessels may have to undergo modifications to enable safe use as support vessels. The sensitivity of the receptor is, therefore, considered to be **low**.

**Scallop vessels – Isle of Man**

11.8.8.9 These vessels have low suitability to provide marine operational support during the construction phase; these vessels may have to undergo modifications to enable safe use as support vessels. The sensitivity of the receptor is, therefore, considered to be **low**.

**Other scallop vessels**

11.8.8.10 These vessels have low suitability to provide marine operational support during the construction phase; these vessels may have to undergo modifications to enable safe use as support vessels. The sensitivity of the receptor is, therefore, considered to be **low**.

**Herring vessels**

11.8.8.11 These vessels have moderate suitability to provide marine operational support during the construction phase. This is based on the vessel type and size, which means they have the capacity to provide support; in addition to the assumption that vessels have the relevant workboat certifications for the vessel and crew. The sensitivity of the receptor is therefore, considered to be **medium**.

**Significance of effect**

11.8.8.12 A summary of the impact magnitude, sensitivity of receptors and overall effect significance is provided in Table 11.29.

**Table 11.29: Magnitude, sensitivity and impact significance relating to supply chain opportunities for local fishing vessels during construction of the Morgan Generation Assets.**

Receptor Group	Magnitude	Sensitivity	Significance
Offshore static gear vessels	Low	Medium	Minor
Beam trawl vessels	Low	Negligible	Negligible
Scottish west coast scallop vessels	Low	Low	Minor
Isle of man scallop vessels	Low	Low	Minor
Other scallop vessels	Low	Low	Minor
Herring vessels	Low	Medium	Minor

**Operations and maintenance phase**

11.8.8.13 During the operations and maintenance phase (35 years), there may be opportunities for commercial fishing vessels to provide marine operational support, such as OFLO duties and guard vessel requirements during periods of major maintenance.

**Magnitude of impact**

11.8.8.14 Due to this impact being beneficial, the definition for magnitude has been amended to align with the terms for beneficial impacts, that are outlined in Table 5.4 of volume 1, chapter 5: EIA methodology.

11.8.8.15 The magnitude for all commercial fisheries receptor groups during the operations and maintenance phase is considered to be lower than during construction, as the supply chain opportunities are likely to be shorter term and more intermittent. It is predicted that the impact will affect the receptors directly, but only be of very minor benefit, as it

is judged that any such support by these receptor groups would create a value equivalent to less than 5% of the receptor groups' annual value of landings. The magnitude is therefore, considered to be **negligible**.

**Sensitivity of receptor**

- 11.8.8.16 For this impact, the sensitivity has been defined by the likely potential the receptor group has to provide support to the Morgan Generation Assets.
- 11.8.8.17 The sensitivity of the receptor groups remains the same as described for the construction phase of this impact, as summarised in Table 11.30.

**Significance of effect**

- 11.8.8.18 A summary of the impact magnitude, sensitivity of receptors and overall effect significance is provided in Table 11.30.

**Table 11.30: Magnitude, sensitivity and impact significance relating to supply chain opportunities for local fishing vessels during the operations and maintenance phase of the Morgan Generation Assets.**

Receptor Group	Magnitude	Sensitivity	Significance
Offshore static gear vessels	Negligible	Medium	Minor
Beam trawl vessels	Negligible	Negligible	Negligible
Scottish west coast scallop vessels	Negligible	Low	Negligible
Isle of man scallop vessels	Negligible	Low	Minor
Other scallop vessels	Negligible	Low	Negligible
Herring vessels	Negligible	Medium	Minor

**Decommissioning phase**

- 11.8.8.19 In the absence of detailed methodologies for the decommissioning phase the supply chain opportunities for local fishing vessels are considered the same as for the construction phase, as summarised in Table 11.29.

**11.8.9 Potential impacts on commercial fisheries as a result of increased risk of introduction and spread of INNS**

- 11.8.9.1 As assessed in chapter 7: Benthic subtidal and intertidal ecology of the PEIR, no significant effects are likely to occur as a result of the risk of introduction and spread of INNS during the construction, operation and maintenance and decommissioning phases. This is due to the fact that only a small proportion of the Morgan Generation Asset benthic subtidal and intertidal ecology study area that may be colonised. Furthermore measure have been adopted to minimise the effects from introduction or spread of INNS. Therefore, as a result there will be no significant effects on commercial fisheries.

**11.8.10 Future monitoring**

- 11.8.10.1 Table 11.31 below outlines the proposed monitoring commitments for commercial fisheries.

**Table 11.31: Monitoring commitments.**

Environmental effect	Monitoring commitment	Means of implementation
Potential snagging risk.	Monitoring of the cables and their burial status to reduce snagging risk.	Expected to be a condition of the deemed Marine Licence (dML) within the DCO.
Effects of the operational phase on fishing activity and subsequent value.	Annual reviews for the first five years of the operational phase, to review VMS data and landings data to identify whether there are any changes to fishing activity within the Morgan Array Area.	Commitment to undertake this to be included within the outline Fisheries Liaison and Co-existence Plan, which will be submitted as part of the DCO application.

**11.9 Cumulative effect assessment methodology**

**11.9.1 Methodology**

- 11.9.1.1 The CEA takes into account the impact associated with the Morgan Generation Assets together with other projects and plans. The projects and plans selected as relevant to the CEA presented within this chapter are based upon the results of a screening exercise (see volume 3, annex 5.1: CEA screening matrix of the PEIR). Each project has been considered on a case by case basis for screening in or out of this chapter's assessment based upon data confidence, effect-receptor pathways and the spatial/temporal scales involved.
- 11.9.1.2 The commercial fisheries CEA methodology has followed the methodology set out in volume 1, chapter 5: EIA methodology of the PEIR. As part of the assessment, all projects and plans considered alongside the Morgan Generation Assets have been allocated into 'tiers' reflecting their current stage within the planning and development process, these are listed below.
- 11.9.1.3 A tiered approach to the assessment has been adopted, as follows:
  - Tier 1
    - Under construction
    - Permitted application
    - Submitted application
    - Those currently operational that were not operational when baseline data were collected, and/or those that are operational but have an ongoing impact
  - Tier 2
    - Scoping report has been submitted and is in the public domain
  - Tier 3



**MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS**

- Scoping report has not been submitted and is not in the public domain
- Identified in the relevant Development Plan
- Identified in other plans and programmes.

11.9.1.4 This tiered approach is adopted to provide a clear assessment of the Morgan Generation Assets alongside other projects, plans and activities. The specific projects, plans and activities scoped into the CEA, are outlined in Table 11.32 and displayed in Figure 11.7.

11.9.1.5 The range of potential cumulative impacts is identified in Table 11.33 and is a subset of those considered for the Morgan Generation Assets alone. Where the potential significant effect for the Morgan Generation Assets alone is assessed as negligible or where an impact is predicted to be highly localised, these will not generally be considered within the CEA, as there is not considered to be a potential for cumulative effects with other plans, projects or activities.

11.9.1.6 Given the operational ranges of the fishing fleets active in the region, and considering feedback from consultation, the study area for the CEA for commercial fisheries remains the same as for the main assessment (ICES Rectangles 36E5, 36E6, 37E5 and 37E6) (Figure 11.1). This study area will ensure that relevant regional fishing grounds, for a range of different fishing fleets, are fully assessed as part of the CEA.

11.9.1.7 For the purposes of this assessment, projects and activities have not been included where they are considered to be included in the baseline, such as shipping routes operational offshore wind farms, aggregate areas<sup>9</sup>, operational cables and pipelines, anchorages and existing restrictions within Marine Protected Areas (MPAs), as commercial fisheries receptors would already be adapted to them and they do not have significant effects on commercial fisheries receptors.

<sup>9</sup> Aggregate areas have been considered with regard to fish and shellfish ecology, as described in volume 2, chapter 8: Fish and shellfish ecology of the PEIR.

**Table 11.32: List of other projects, plans and activities considered within the CEA.**

Project/Plan	Status	Distance from the Morgan Generation Assets (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Morgan Generation Assets <sup>10</sup>
<b>Tier 2 -</b>						
Morgan Offshore Wind Project and Morecambe Offshore Wind Farm: Transmission Assets	Pre-application	0	Coordinated transmission assets for the Morgan Offshore Wind Farm Generation Assets and the Morecambe Offshore Wind Farm Generation Assets Project	2026	2030	Yes
Mona Offshore Wind Project	Pre-application	5.52	Proposed offshore wind farm. Maximum of 107 wind turbines. Area: 322.2km <sup>2</sup> .	2026	2030	Yes
Morecambe Offshore Wind Farm Generation Assets Project	Pre-application	11.24	Proposed offshore wind farm. Maximum of 40 wind turbines and indicative minimum spacing between wind turbines of 990m. Area: 125km <sup>2</sup> .	2026	2028	Yes

<sup>10</sup> Temporal overlap, including the construction phase of the Mona Offshore Wind Project with the operation and maintenance phase of other projects (e.g. cable repairs).

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

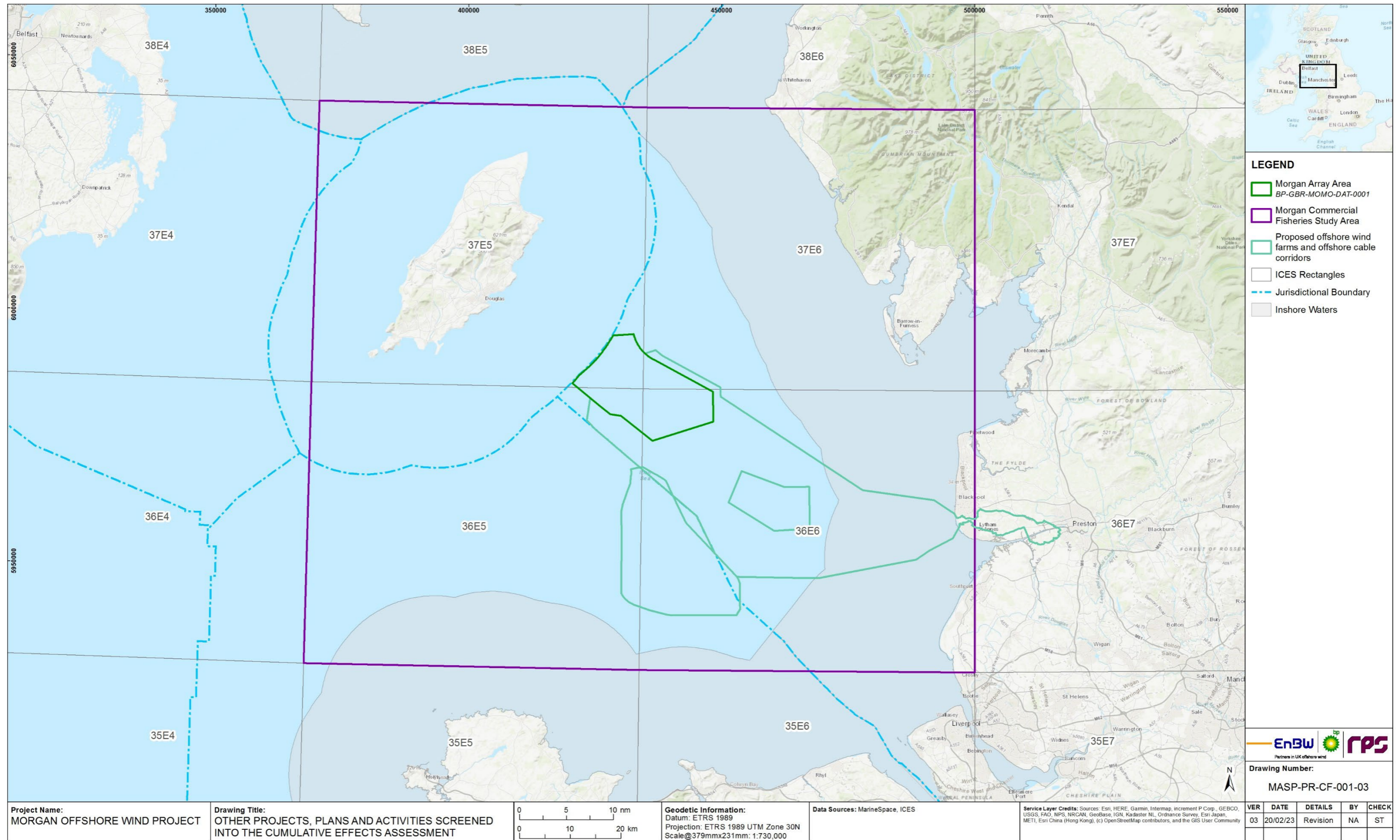


Figure 11.7: Other projects, plans and activities screened into the cumulative effects assessment.

## 11.9.2 Maximum design scenario

- 11.9.2.1 The MDSs identified in Table 11.33 have been selected as those having the potential to result in the greatest effect on an identified receptor or receptor group. The cumulative effects presented and assessed in this section have been selected from the PDE provided in volume 1, chapter 3: Project description of the PEIR, as well as the information available on other projects and plans, in order to inform a 'MDS'. Effects of greater adverse significance are not predicted to arise should any other development scenario, based on details within the PDE (e.g. different wind turbine layout), to that assessed here, be taken forward in the final design scheme.

**Table 11.33: MDS considered for the assessment of potential cumulative effects on commercial fisheries.**

<sup>a</sup> C=construction, O=operation and maintenance, D=decommissioning

Potential cumulative effect	Phase <sup>a</sup>			Maximum Design Scenario	Justification
	C	O	D		
Loss or restricted access to fishing grounds	✓	✓	✓	MDS as described for the Morgan Generation Assets (Table 11.12) assessed cumulatively with the following other projects/plans: <b>Tier 2</b> <ul style="list-style-type: none"> <li>Two proposed offshore wind farms and associated transmission asset</li> </ul>	Outcome of the CEA will be greatest when the greatest number of other schemes, which would result in a loss or restricted access to fishing ground, are considered within the cumulative commercial fisheries study area.
Interference with fishing activity					
Loss or damage to fishing gear due to snagging	✓	✓	✓		
Potential impacts on commercially important fish and shellfish stocks	✓	✓	✓	<ul style="list-style-type: none"> <li>As described in volume 2, chapter 8: Fish and shellfish ecology of the PEIR.</li> </ul>	Outcome of the CEA will be greatest when the greatest number of other schemes, which would result in potential impacts on commercially important fish and shellfish stocks, are considered within the cumulative commercial fisheries study area.

**11.10 Cumulative effects assessment**

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

11.10.1.2 The likelihood of any significant effects on commercial fisheries occurring would largely depend on the operational practices of each particular fleet, the location and extent of their grounds relative to other developments and the timings of the construction, operational and decommissioning phases. Effects and receptor groups are only discussed where there is the potential for a cumulative effect to arise.

**11.10.2 Loss or restricted access to fishing grounds**

11.10.2.1 For loss or restricted access to fishing grounds, the potential significant effect for the Morgan Generation Assets alone, across all phases, is assessed as negligible for all receptor groups other than the Scottish west coast scallop vessels. Therefore, only the Scottish west coast scallop vessels have been considered within the CEA for this impact, as there is not considered to be a potential for cumulative effects with other plans, projects or activities for the other receptor groups.

**Tier 2**

**Construction phase**

11.10.2.2 There is potential for cumulative loss or restricted access to fishing grounds for Scottish west coast scallop vessels, as a result of the Morgan Generation Assets construction phase which will overlap with the projects listed in Table 11.32.

**Magnitude of impact**

**Scallop vessels – Scottish west coast**

11.10.2.3 It is anticipated that this receptor group will lose access to fishing grounds during the construction phases of the Morecambe Offshore Wind Farm Generation Assets, Mona Offshore Wind Project and the Morgan and Morecambe Offshore Wind Farm: Transmission Assets. This receptor group is less active within the Morecambe Offshore Wind Farm Generation Assets, but very active within the central part of the Mona Array Area. The MDS for this receptor group would be loss of access to key fishing grounds as a result of the construction areas from these areas and the Morgan Generation Assets; the total area from the three array areas alone is approximately 897km<sup>2</sup>. However, it is likely that there will be rolling safety and/or exclusion zones during the construction phases of these wind farms, which will minimise loss of area to this receptor group.

11.10.2.4 Loss or restricted access as a result of the Morecambe Offshore Wind Farm Generation Assets, Mona Offshore Wind Project and the Morgan and Morecambe Offshore Wind Farm: Transmission Assets construction phases combined with the Morgan Generation Assets is not anticipated to result in a reduction of more than 20% of the annual value of landings, due to the temporary and intermittent nature of the works.

11.10.2.5 The cumulative impact is predicted to be of local to regional spatial extent, short to medium term duration (i.e. less than four years), intermittent, and with high reversibility due to the temporary nature of the works. It is predicted that the impact will affect the receptor directly, but be of low magnitude, as it is judged that it would affect an area from which a minor proportion of the receptor group’s annual value of landings is caught. The magnitude of cumulative impact is, therefore, considered to be **low**.

**Sensitivity of the receptor**

11.10.2.6 This receptor group has limited spatial tolerance due to significant dependence upon the commercial fisheries study area for queen scallop dredging. The Scottish west coast scallop vessels also have a limited ability to deploy alternative gear.

11.10.2.7 Scottish west coast scallop vessels are deemed to be of high spatial adaptability, limited spatial tolerance and limited recoverability. The sensitivity of the receptor to cumulative impacts is considered to be **medium**.

**Significance of effect**

11.10.2.8 A summary of the impact magnitude, sensitivity of receptor and overall effect significance is provided in Table 11.34.

**Table 11.34: Magnitude, sensitivity and impact significance relating to loss or restricted access to fishing grounds during construction of the Morgan Generation Assets.**

Receptor Group	Magnitude	Sensitivity	Significance
Scottish west coast scallop vessels	Low	Medium	Minor

**Operations and maintenance phase**

11.10.2.9 There is potential for cumulative loss or restricted access to fishing grounds for Scottish west coast scallops, as a result of the Morgan Generation Assets operations and maintenance phase, which will overlap with the projects listed in Table 11.32

**Magnitude of impact**

**Scallop vessels – Scottish west coast**

11.10.2.10 This receptor group has indicated that they may be able to continue fishing within the Morgan Array Area and Mona Array Area during the operations and maintenance phase based on the minimum spacing (1,000m between rows of wind turbines), but fishing activity could be severely restricted. The Morecambe Array Area is proposed to have a minimum spacing of 990m, which could also result in a loss of fishing grounds for this receptor group. The total area from the three array areas alone is approximately 897km<sup>2</sup>. This cumulative loss of area could affect an area from which a moderate proportion (20-50%) of this commercial fisheries receptor’s annual value of landings is caught.

11.10.2.11 In light of the above, the cumulative impact is predicted to be of regional spatial extent, long term duration, continuous, and with low reversibility. It is predicted that the impact

will affect the receptor directly, and be of medium magnitude, as it is judged that it would affect an area from which a moderate proportion of the receptor group's annual value of landings is caught. The magnitude of cumulative impact is, therefore, considered to be **medium**.

#### Sensitivity of the receptor

11.10.2.12 The sensitivity of this receptor group remains the same as described for the construction phase of this impact and is summarised in Table 11.35.

#### Significance of effect

11.10.2.13 A summary of the impact magnitude, sensitivity of receptor and overall effect significance is provided in Table 11.35.

**Table 11.35: Magnitude, sensitivity and impact significance relating to loss or restricted access to fishing grounds during the operations and maintenance phase of the Morgan Generation Assets.**

Receptor Group	Magnitude	Sensitivity	Significance
Scottish west coast scallop vessels	Moderate	Medium	Moderate

#### Further mitigation and residual effect

11.10.2.14 The operational phases of the Morecambe and Mona Offshore Wind Projects, combined with the operational phase of the Morgan Generation Assets could cumulatively add to the loss of key fishing grounds for the Scottish west coast scallop vessels. It is predicted that this cumulative effect will be of **moderate** adverse significance.

11.10.2.15 In response to this significant cumulative effect, the Applicant commits to working closely with these other projects to reduce the significance of cumulative effect on these commercial fisheries receptors.

11.10.2.16 As discussed in section 11.8.2, a moderate adverse effect is predicted on the Scottish west coast scallop vessels receptor, which is significant in terms of the EIA Regulations. In order to mitigate this effect on the Scottish west coast scallop fleet, options to increase the minimum distance between wind turbines and options to align the turbines with orientation of fishing tows are being explored by the Applicant that could allow for continued scallop dredging within the Morgan Array Area, thus increasing potential for coexistence.

11.10.2.17 With these commitments that will explore mitigation options, the magnitude of impact is predicted to reduce to low, resulting in a residual effect of **minor adverse** significance, which is not significant in EIA terms.

### 11.10.3 Interference with fishing activity

11.10.3.1 For interference with fishing activity, the potential significant effect for the Morgan Generation Assets alone, across all phases, is assessed as negligible for all receptor groups other than the offshore static gear vessels. Therefore, only the offshore static

gear vessels have been considered within the CEA for this impact, as there is not considered to be a potential for cumulative effects with other plans, projects or activities for the other receptor groups.

#### Tier 2

##### Construction phase

11.10.3.2 There is potential for cumulative interference with fishing activity for offshore static gear vessels, as a result of the Morgan Generation Assets construction phase which will overlap with the projects listed in Table 11.32.

#### Magnitude of impact

##### Offshore static gear vessels

11.10.3.3 It is anticipated that this receptor group will experience cumulative interference with fishing activity during the construction phases of the Morecambe Offshore Wind Farm Generation Assets Project and Mona Offshore Wind Projects. The MDS for this receptor group would be interference with fishing activity over a combined area from the Mona, Morecambe and Morgan Array Areas at one time; total area from the three array areas alone is approximately 897km<sup>2</sup>, which equates to approximately 17% of the cumulative commercial fisheries study area beyond 12nm. However, there will be rolling exclusion zones during the construction phases of the wind farms, which will minimise interference with fishing activity with this receptor group. There is potential for an increase in interference with fishing activity, however this receptor group has a high spatial adaptability and ability to fish numerous grounds.

11.10.3.4 In light of the above, the cumulative impact is predicted to be of local spatial extent, short to medium term duration (i.e. less than four years), intermittent, and with high reversibility due to the temporary nature of the works. It is predicted that the impact will affect the receptor directly. The magnitude of cumulative impact is, therefore, considered to be **low**.

#### Sensitivity of the receptor

11.10.3.5 This commercial fisheries receptor comprises larger offshore vessels (>12 m) that deploy static gear and has high spatial adaptability due to the extent of its operational range. These vessels will be affected by construction vessels within the Morgan Array Area. The marker buoys deployed by the offshore static gear vessels are vulnerable to potential interference by construction vessels, due to their poor visibility. The offshore static gear vessels are deemed to be of medium vulnerability. The sensitivity of the receptor is therefore, considered to be **medium**.

#### Significance of effect

11.10.3.6 A summary of the impact magnitude, sensitivity of receptor and overall effect significance is provided in Table 11.36.

**Table 11.36: Magnitude, sensitivity and impact significance relating to interference with fishing activity during construction of the Morgan Generation Assets.**

Receptor Group	Magnitude	Sensitivity	Significance
Offshore static gear vessels	Low	Medium	Minor

**Operations and maintenance phase**

11.10.3.7 There is potential for cumulative interference with fishing activity for offshore static gear vessels, as a result of the Morgan Generation Assets operations and maintenance phase, which will overlap with the projects listed in Table 11.32.

**Magnitude of impact**

**Offshore static gear vessels**

11.10.3.8 It is presumed that this receptor group will continue to fish within the Morgan Array Area and that of the Morecambe Offshore Wind Farm Generation Assets Project and Mona Offshore Wind Projects. Although operations and maintenance vessel traffic will add to the existing level of shipping activity in the area, there are already moderate levels of vessel traffic in the area, and there is co-existence of fishing vessels with other marine traffic. Interference with fishing as a result of the construction phases of all 3 projects is not anticipated to result in a reduction of more than 20% of the annual value of landings, due to the temporary and intermittent nature of the works.

11.10.3.9 The cumulative impact is predicted to be of local spatial extent, long term duration, intermittent, and with high reversibility due the temporary nature of the works. It is predicted that the impact will affect the receptor directly. The magnitude of cumulative impact is, therefore, considered to be **low**.

**Sensitivity of the receptor**

11.10.3.10 The sensitivity of the receptor group remains the same as described for the construction phase of this impact for and is summarised in Table 11.37.

**Significance of effect**

11.10.3.11 A summary of the impact magnitude, sensitivity of receptor and overall effect significance is provided Table 11.37.

**Table 11.37: Magnitude, sensitivity and impact significance relating to interference with fishing activity during the operations and maintenance phase of the Morgan Generation Assets.**

Receptor Group	Magnitude	Sensitivity	Significance
Offshore static gear vessels	Low	Medium	Minor

**11.10.4 Loss or damage of fishing gear due to snagging**

11.10.4.1 For loss or damage of fishing gear due to snagging, the potential significant effect for the Morgan Generation Assets alone, across all phases, is assessed as negligible for all receptor groups other than the Scottish west coast scallop vessels. Therefore, only the Scottish west coast scallop vessels have been considered within the CEA for this impact, as there is not considered to be a potential for cumulative effects with other plans, projects or activities for the other receptor groups.

**Tier 2**

**Construction phase**

11.10.4.2 There is potential for cumulative loss or damage of fishing gear due to snagging for Scottish west coast scallop vessels, as a result of the Morgan Generation Assets construction phase which will overlap with the projects listed in Table 11.32.

**Magnitude of impact**

11.10.4.3 Given the proposed measures adopted as part of the Morgan Generation Assets and the commitments to follow standard protocols, in addition to the safety aspects that would be applied by all other projects, the cumulative impacts would remain as assessed for the Morgan Generation Assets alone. The magnitude of cumulative impact is, therefore, as summarised in Table 11.38.

**Sensitivity of receptor**

11.10.4.4 Although vessels within this receptor group exhibit a relatively high operational range, they possess limited spatial tolerance due to their high dependence upon the commercial fisheries study area for queen scallop dredging. The Scottish west coast scallop vessels also have a limited ability to deploy alternative gear.

11.10.4.5 During consultation, this receptor group clarified that penetration of gear varied between 0.05-0.25m. The nature of the gear deployed means that the vulnerability of this receptor group is high, and the method of fishing by scallop dredgers, means that vessels need to tow nets/trawls under significant power, and at defined speeds. The sensitivity of the receptor is, therefore, considered to be **high**.

**Significance of effect**

11.10.4.6 A summary of the impact magnitude, sensitivity of receptor and overall effect significance is provided in Table 11.38.

**Table 11.38: Magnitude, sensitivity and impact significance relating to loss or damage of fishing gear due to snagging during construction of the Morgan Generation Assets.**

Receptor Group	Magnitude	Sensitivity	Significance
Scottish west coast scallop vessels	Negligible	High	Minor



**Operations and maintenance phase**

11.10.4.7 There is potential for cumulative loss or damage of fishing gear due to snagging for Scottish west coast scallop vessels, as a result of the Morgan Generation Assets operations and maintenance phase, which will overlap with the projects listed in Table 11.32.

**Magnitude of impact**

11.10.4.8 Given the proposed measures adopted as part of the Morgan Generation Assets and the commitments to follow standard protocols, in addition to the safety aspects that would be applied by all other projects, the cumulative impacts would remain as assessed for the Morgan Generation Assets alone. The magnitude of cumulative impact is, therefore, as summarised in Table 11.39.

**Sensitivity of receptor**

11.10.4.9 The sensitivity for Scottish west coast scallop vessels remains the same as described for the construction phase of this cumulative impact, as summarised in Table 11.39.

**Significance of effect**

11.10.4.10 A summary of the impact magnitude, sensitivity of receptor and overall effect significance is provided in Table 11.39.

**Table 11.39: Magnitude, sensitivity and impact significance relating to loss or damage of fishing gear due to snagging during the operations and maintenance phase of the Morgan Generation Assets.**

Receptor Group	Magnitude	Sensitivity	Significance
Scottish west coast scallop vessels	Negligible	High	Minor

**11.10.5 Potential impacts on commercially important fish and shellfish resources**

11.10.5.1 The following potential cumulative impacts on fish and shellfish ecology via the construction, operations and maintenance, and decommissioning phases of the Morgan Generation Assets have been identified which are relevant to commercial fish species:

- Temporary habitat loss/disturbance
- Underwater noise creating injury and/or disturbance
- Increased suspended sediment concentrations (SSCs) and associated sediment deposition
- Long-term habitat loss
- Colonisation of hard structures
- EMFs from subsea electrical cabling

11.10.5.2 These potential cumulative impacts on fish and shellfish ecology are assessed within volume 2, chapter 8: Fish and Shellfish Ecology of the PEIR.

11.10.5.3 The fish and shellfish ecology cumulative assessment concluded that for all impacts during the construction, operation and maintenance, and decommissioning phases of the Morgan Generation Assets, the effect will be of no greater than minor adverse significance for commercial fish species, which is not significant in EIA terms. Therefore, no significant impact is predicted for commercial fisheries receptor groups.

**11.10.6 Future monitoring**

11.10.6.1 Table 11.40 below outlines the proposed monitoring commitments for commercial fisheries.

**Table 11.40: Monitoring commitments.**

Environmental effect	Monitoring commitment	Means of implementation
Effects of the operational phase on fishing activity and subsequent value.	Annual reviews for the first five years of the operational phase, to review VMS data and landings data to identify whether there are any changes to fishing activity within the Morgan Array Area.	Commitment to undertake this to be included within the outline Fisheries Liaison and Co-existence Plan, which will be submitted as part of the DCO application.

**11.11 Transboundary effects**

11.11.1.1 A screening of transboundary impacts has been carried out and any potential for significant transboundary effects with regard to commercial fisheries from the Morgan Generation Assets upon the interests of other states has been assessed as part of this PEIR. The potential transboundary impacts assessed within volume 3, annex 5.2: Transboundary screening of the PEIR, are summarised below. Potential impacts on both UK and foreign commercial fishing fleets have been considered as part of this impact assessment (section 11.8); it was predicted that there will be no significant effects on Irish and Belgian vessels which operate within the commercial fisheries study area. Transboundary impacts outside UK waters are as follows:

- Potential effects on commercially important fish and shellfish resources will be restricted to the Morgan Array Area and immediate surrounding areas, with the exception of underwater noise and the impacts of increased suspended sediment concentrations and associated sediment deposition. Effects of underwater noise on fish and shellfish receptors, and therefore commercial fisheries receptors, are not predicted to extend beyond UK and Isle of Man waters. The identified tidal excursion of 20km means that any increased SSC is likely to settle out before crossing any international boundaries, suggesting this impact is unlikely to have any significant transboundary effect on fish and shellfish stocks and therefore commercial fisheries receptors. Therefore, the potential transboundary impact of effects on commercially important fish and shellfish stocks is concluded to be not significant in EIA terms
- Displacement of fishing vessels could occur into non-UK waters, such as the Isle of Man waters. However, it is not anticipated that there would be a

significant displacement of fishing vessels into these EEZs, based on the established fishing grounds of the receptor groups within this assessment. For example, scallop vessels may be displaced into Isle of Man waters from the Morgan Generation Assets, but due to the extensive king scallop grounds within the Irish Sea and the current management measures in place for this fishery in the Isle of Man, this impact is concluded as not significant. Queen scallop grounds are more discrete, however there are strict management measures in place which also control this fishery in Isle of Man waters, which would limit the displacement of scallop vessels targeting queen scallops into Isle of Man waters. Therefore, the potential transboundary impact of effects on displacement of fishing vessels is concluded to be not significant in EIA terms.

## 11.12 Inter-related effects

11.12.1.1 Inter-relationships are considered to be the impacts and associated effects of different aspects of the proposal on the same receptor. These are considered to be:

- Project lifetime effects: Assessment of the scope for effects that occur throughout more than one phase of the Morgan Generation Assets (construction, operations and maintenance, and decommissioning), to interact to potentially create a more significant effect on a receptor, than if just assessed in isolation in these three phases (e.g. subsea noise effects from piling, operational wind turbines, vessels and decommissioning)
- Receptor led effects: Assessment of the scope for all effects to interact, spatially and temporally, to create inter-related effects on a receptor. As an example, all effects on commercial fisheries, such as direct habitat loss or disturbance, sediment plumes, scour, jack-up vessel use etc., may interact to produce a different, or greater effect on this receptor than when the effects are considered in isolation. Receptor-led effects may be short term, temporary or transient effects, or incorporate longer term effects.

11.12.1.2 A description of the likely interactive effects arising from the Morgan Generation Assets on commercial fisheries is provided in volume 2, chapter 15: Inter-related effects of the PEIR.

## 11.13 Summary of impacts, mitigation measures and monitoring

11.13.1.1 Information on commercial fisheries within the commercial fisheries study area was collected through a review of official datasets; additional information and knowledge obtained through consultation with fisheries groups; and site-specific surveys.

- Table 11.41 presents a summary of the potential impacts, measures adopted as part of the Morgan Generation Assets and residual effects in respect to commercial fisheries. The impacts assessed include loss or restricted access to fishing grounds, displacement of fishing activity, interference with fishing activity, temporary increase in steaming distances, loss of damage to fishing gear due to snagging, potential impacts on commercially important fish stocks, and supply chain opportunities for local fishing vessels. Overall, it is concluded that there will be no significant effects arising from the Morgan Generation Assets during the construction, operations and maintenance or decommissioning phases in relation to commercial fisheries following the implementation of embedded and further mitigation measures

- Table 11.42 presents a summary of the potential cumulative impacts, mitigation measures and residual effects. The cumulative impacts assessed include loss or restricted access to fishing grounds, interference with fishing activity, loss of damage to fishing gear due to snagging and potential impacts on commercially important fish stocks. Overall it is concluded that there will be no significant cumulative effects on commercial fisheries from the Morgan Generation Assets alongside other projects/plans following the implementation of embedded and further mitigation measures
- The following potential transboundary impacts have been identified in regard to effects of the Morgan Generation Assets:
  - Potential effects on commercially important fish and shellfish resources
  - Displacement of fishing vessels.

**Table 11.41: Summary of potential environmental effects, mitigation and monitoring.**

<sup>a</sup> C=construction, O=operation and maintenance, D=decommissioning

Description of impact	Phase <sup>a</sup>			Measures adopted as part of the project	Magnitude of impact	Sensitivity of the receptor	Significance of effect	Further mitigation	Residual effect	Proposed monitoring
	C	O	D							
Loss or restricted access to fishing grounds	✓	✓	✓	<p>Ongoing liaison with the fishing industry through the CFLO and FIR and adherence to good practice guidance with regards to fisheries liaison.</p> <p>Development of a Fisheries Co-existence and Liaison Plan, which will be submitted as part of the DCO application</p> <p>Advance warning to fishing fleets of construction, maintenance and decommissioning activities.</p> <p>Use of advisory clearance distances and safety zones during construction and periods of major maintenance.</p> <p>Optimal foundation/wind turbine spacing and cable alignment to allow space for commercial fishing activities where possible (whilst also considering other key aspects, such as ground conditions, wind yield and environmental constraints).</p>	<p>Offshore static gear vessels</p> <p>C: Low</p> <p>O: Negligible</p> <p>D: Negligible</p> <p>Beam trawl vessels</p> <p>C: Negligible</p> <p>O: Negligible</p> <p>D: Negligible</p> <p>Scallop vessels – Scottish west coast</p> <p>C: Low</p> <p>O: Medium</p> <p>D: Low</p> <p>Scallop vessels – Isle of Man</p> <p>C: Low</p> <p>O: Negligible</p> <p>D: Low</p> <p>Other scallop vessels</p> <p>C: Negligible</p> <p>O: Negligible</p> <p>D: Negligible</p> <p>Herring vessels</p> <p>C: Negligible</p> <p>O: Negligible</p> <p>D: Negligible</p>	<p>Offshore static gear vessels</p> <p>C: Low</p> <p>O: Low</p> <p>D: Low</p> <p>Beam trawl vessels</p> <p>C: Negligible</p> <p>O: Negligible</p> <p>D: Negligible</p> <p>Scallop vessels – Scottish west coast</p> <p>C: Medium</p> <p>O: Medium</p> <p>D: Medium</p> <p>Scallop vessels – Isle of Man</p> <p>C: Low</p> <p>O: Low</p> <p>D: Low</p> <p>Other scallop vessels</p> <p>C: Negligible</p> <p>O: Negligible</p> <p>D: Negligible</p> <p>Herring vessels</p> <p>C: Low</p> <p>O: Low</p> <p>D: Low</p>	<p>Offshore static gear vessels</p> <p>C: Negligible</p> <p>O: Negligible</p> <p>D: Negligible</p> <p>Beam trawl vessels</p> <p>C: Negligible</p> <p>O: Negligible</p> <p>D: Negligible</p> <p>Scallop vessels – Scottish west coast</p> <p>C: Minor</p> <p>O: Moderate</p> <p>D: Minor</p> <p>Scallop vessels – Isle of Man</p> <p>C: Negligible</p> <p>O: Negligible</p> <p>D: Negligible</p> <p>Other scallop vessels</p> <p>C: Negligible</p> <p>O: Negligible</p> <p>D: Negligible</p> <p>Herring vessels</p> <p>C: Negligible</p> <p>O: Negligible</p> <p>D: Negligible</p>	<p>O: Options to increase the minimum distance between WTGs and options to align the turbines with orientations of fishing tows are being explored by the Applicant.</p>	<p>Not assessed for PEIR as further mitigation is to be considered and included as part of the DCO application (see section 11.14).</p>	<p>O: Annual review for the first five years of the operational phase, to review VMS and landings data to identify whether there are any changes to fishing activity within the Morgan Array Area</p>
Displacement of fishing activity into other areas	✓	✓	✓	<p>Advance warning to fishing fleets of construction, maintenance and decommissioning activities.</p> <p>Use of advisory clearance distances and safety zones during construction and periods of major maintenance.</p> <p>Optimal foundation/wind turbine spacing and cable alignment to allow space for commercial fishing activities where possible (whilst also considering other key aspects, such as ground conditions, wind yield and environmental constraints).</p>	<p>Offshore static gear vessels</p> <p>C: Negligible</p> <p>O: Negligible</p> <p>D: Negligible</p> <p>Beam trawl vessels</p> <p>C: Negligible</p> <p>O: Negligible</p> <p>D: Negligible</p>	<p>Offshore static gear vessels</p> <p>C: Low</p> <p>O: Low</p> <p>D: Low</p> <p>Beam trawl vessels</p> <p>C: Negligible</p> <p>O: Negligible</p> <p>D: Negligible</p>	<p>Offshore static gear vessels</p> <p>C: Negligible</p> <p>O: Negligible</p> <p>D: Negligible</p> <p>Beam trawl vessels</p> <p>C: Negligible</p> <p>O: Negligible</p> <p>D: Negligible</p>	<p>None.</p>	<p>None.</p>	<p>None.</p>

Description of impact	Phase <sup>a</sup> Measures adopted as part of the project			Magnitude of impact	Sensitivity of the receptor	Significance of effect	Further mitigation	Residual effect	Proposed monitoring
	C	O	D						
				Scallop vessels – Scottish west coast	Scallop vessels – Scottish west coast	Scallop vessels – Scottish west coast			
				C: Negligible	C: Medium	C: Negligible			
				O: Negligible	O: Medium	O: Negligible			
				D: Negligible	D: Medium	D: Negligible			
				Scallop vessels – Isle of Man	Scallop vessels – Isle of Man	Scallop vessels – Isle of Man			
				C: Negligible	C: Low	C: Negligible			
				O: Negligible	O: Low	O: Negligible			
				D: Negligible	D: Low	D: Negligible			
				Other scallop vessels	Other scallop vessels	Other scallop vessels			
				C: Negligible	C: Negligible	C: Negligible			
				O: Negligible	O: Negligible	O: Negligible			
				D: Negligible	D: Negligible	D: Negligible			
				Herring vessels	Herring vessels	Herring vessels			
				C: Negligible	C: Low	C: Negligible			
				O: Negligible	O: Low	O: Negligible			
				D: Negligible	D: Low	D: Negligible			
				<i>Nephrops</i> vessels	<i>Nephrops</i> vessels	<i>Nephrops</i> vessels			
				C: Negligible	C: Negligible	C: Negligible			
				O: Negligible	O: Negligible	O: Negligible			
				D: Negligible	D: Negligible	D: Negligible			

Description of impact	Phase <sup>a</sup>			Measures adopted as part of the project	Magnitude of impact	Sensitivity of the receptor	Significance of effect	Further mitigation	Residual effect	Proposed monitoring
	C	O	D							
Interference with fishing activity	✓	✓	✓	Ongoing liaison with the fishing industry through the CFLO and FIR and adherence to good practice guidance with regards to fisheries liaison. Development of a Fisheries Co-existence and Liaison Plan, which will be submitted as part of the DCO application. Advance warning to fishing fleets of construction, maintenance and decommissioning activities. Timely and efficient distribution of NtMs. Use of advisory clearance distances and safety zones during construction and periods of major maintenance. Use of guard vessels where required by risk assessment. Adequate navigational markers (including lighting), in accordance with the most recent relevant industry guidance. NRA.	Offshore static gear vessels	Offshore static gear vessels	Offshore static gear vessels	None	None	None
					C: Low	C: Medium	C: Minor			
					O: Low	O: Medium	O: Minor			
					D: Low	D: Medium	D: Minor			
					Beam trawl vessels	Beam trawl vessels	Beam trawl vessels			
					C: Low	C: Negligible	C: Negligible			
					O: Low	O: Negligible	O: Negligible			
					D: Low	D: Negligible	D: Negligible			
					Scallop vessels – Scottish west coast	Scallop vessels – Scottish west coast	Scallop vessels – Scottish west coast			
					C: Low	C: Negligible	C: Negligible			
					O: Low	O: Negligible	O: Negligible			
					D: Low	D: Negligible	D: Negligible			
					Scallop vessels – Isle of Man	Scallop vessels – Isle of Man	Scallop vessels – Isle of Man			
					C: Low	C: Negligible	C: Negligible			
					O: Low	O: Negligible	O: Negligible			
			D: Low	D: Negligible	D: Negligible					
			Other scallop vessels	Other scallop vessels	Other scallop vessels					
			C: Low	C: Negligible	C: Negligible					
			O: Low	O: Negligible	O: Negligible					
			D: Low	D: Negligible	D: Negligible					
			Herring vessels	Herring vessels	Herring vessels					
			C: Low	C: Negligible	C: Negligible					
			O: Low	O: Negligible	O: Negligible					
			D: Low	D: Negligible	D: Negligible					

Description of impact	Phase <sup>a</sup> C O D	Measures adopted as part of the project	Magnitude of impact	Sensitivity of the receptor	Significance of effect	Further mitigation	Residual effect	Proposed monitoring
Temporary increase in steaming distances	✓ × ✓	Ongoing liaison with the fishing industry through the CFLO and FIR and adherence to good practice guidance with regards to fisheries liaison. Development of a Fisheries Co-existence and Liaison Plan, which will be submitted as part of the DCO application. Advance warning to fishing fleets of construction, maintenance and decommissioning activities. Timely and efficient distribution of NtMs. Use of rolling construction zones.	Offshore static gear vessels C: Negligible D: Negligible Beam trawl vessels C: Negligible D: Negligible Scallop vessels – Scottish west coast C: Negligible D: Negligible Scallop vessels – Isle of Man C: Negligible D: Negligible Other scallop vessels C: Negligible D: Negligible Herring vessels C: Negligible D: Negligible	Offshore static gear vessels C: Low D: Low Beam trawl vessels C: Low D: Low Scallop vessels – Scottish west coast C: Low D: Low Scallop vessels – Isle of Man C: Low D: Low Other scallop vessels C: Low D: Low Herring vessels C: Low D: Low	Offshore static gear vessels C: Negligible D: Negligible Beam trawl vessels C: Negligible D: Negligible Scallop vessels – Scottish west coast C: Negligible D: Negligible Scallop vessels – Isle of Man C: Negligible D: Negligible Other scallop vessels C: Negligible D: Negligible Herring vessels C: Negligible D: Negligible	None	None	None
Loss or damage to fishing gear due to snagging	✓ ✓ ✓	Ongoing liaison with the fishing industry through the CFLO and FIR and adherence to good practice guidance with regards to fisheries liaison. Development of a Fisheries Co-existence and Liaison Plan, which will be submitted as part of the DCO application. Advance warning to fishing fleets of construction, maintenance and decommissioning activities. Timely and efficient distribution NtMs. Use of advisory clearance distances and safety zones during construction and periods of major maintenance. Development of a cable burial plan, to outline cable burial depth, cable protection and monitoring of cables. As-laid' co-ordinates of the inter-array and interconnector cables shall be recorded and submitted to the UKHO and KIS-ORCA Service; 'as-laid' cables shall be marked on Admiralty Charts and fisherman's awareness charts (paper and electronic format). Cable protection shall be designed to minimise snagging hazards as far as possible, for example by minimising height above seabed, smooth and shallower profiles, grade used for rock placement, type of rock (e.g. smoother edges). Development of a dropped objects plan. Development of a decommissioning plan.	Offshore static gear vessels C: Negligible O: Negligible D: Negligible Beam trawl vessels C: Negligible O: Negligible D: Negligible Scallop vessels – Scottish west coast C: Negligible O: Negligible D: Negligible Scallop vessels – Isle of Man C: Negligible O: Negligible	Offshore static gear vessels C: Low O: Low D: Low Beam trawl vessels C: Medium O: Medium D: Medium Scallop vessels – Scottish west coast C: High O: High D: High Scallop vessels – Isle of Man C: Medium O: Medium	Offshore static gear vessels C: Negligible O: Negligible D: Negligible Beam trawl vessels C: Negligible O: Negligible D: Negligible Scallop vessels – Scottish west coast C: Minor O: Minor D: Minor Scallop vessels – Isle of Man C: Negligible O: Negligible	None	None	Monitoring of the cables and their burial status to reduce snagging risk.

Description of impact	Phase <sup>a</sup>			Measures adopted as part of the project	Magnitude of impact	Sensitivity of the receptor	Significance of effect	Further mitigation	Residual effect	Proposed monitoring
	C	O	D							
					D: Negligible Other scallop vessels C: Negligible O: Negligible D: Negligible Herring vessels C: Negligible O: Negligible D: Negligible	D: Medium Other scallop vessels C: Medium O: Medium D: Medium Herring vessels C: Negligible O: Negligible D: Negligible	D: Negligible Other scallop vessels C: Negligible O: Negligible D: Negligible Herring vessels C: Negligible O: Negligible D: Negligible			
Potential impacts on commercially important fish and shellfish resources	✓	✓	✓	See volume 2, chapter 8: Fish and shellfish ecology of the PEIR.	Negligible - Medium	Low - Medium	Negligible - Minor	Not required, however further mitigation is currently being investigated to minimise risks of significant impacts from underwater noise if piling occurs during the herring spawning season.	Negligible - Minor	None proposed

Description of impact	Phase <sup>a</sup>			Measures adopted as part of the project	Magnitude of impact	Sensitivity of the receptor	Significance of effect	Further mitigation	Residual effect	Proposed monitoring
	C	O	D							
Supply chain opportunities for local fishing vessels	✓	✓	✓	None	Offshore static gear vessels	Offshore static gear vessels	Offshore static gear vessels	None	None	None
					C: Low	C: Medium	C: Minor			
					O: Negligible	O: Medium	O: Minor			
					D: Low	D: Medium	D: Minor			
					Beam trawl vessels	Beam trawl vessels	Beam trawl vessels			
					C: Low	C: Negligible	C: Negligible			
					O: Negligible	O: Negligible	O: Negligible			
					D: Low	D: Negligible	D: Negligible			
					Scallop vessels – Scottish west coast	Scallop vessels – Scottish west coast	Scallop vessels – Scottish west coast			
					C: Low	C: Low	C: Minor			
					O: Negligible	O: Low	O: Negligible			
					D: Low	D: Low	D: Minor			
					Scallop vessels – Isle of Man	Scallop vessels – Isle of Man	Scallop vessels – Isle of Man			
					C: Low	C: Medium	C: Minor			
					O: Negligible	O: Medium	O: Minor			
			D: Low	D: Medium	D: Minor					
			Other scallop vessels	Other scallop vessels	Other scallop vessels					
			C: Low	C: Low	C: Minor					
			O: Negligible	O: Low	O: Negligible					
			D: Low	D: Low	D: Minor					
			Herring vessels	Herring vessels	Herring vessels					
			C: Low	C: Medium	C: Minor					
			O: Negligible	O: Medium	O: Minor					
			D: Low	D: Medium	D: Minor					
Potential impacts on commercial fisheries as a result of increased risk of introduction and spread of INNS	✓	✓	✓	Development of, and adherence to, an Environmental Management and Monitoring Plan, including actions to minimise INNS.	Low	High	Minor	None	None	None
Increased collision and allision risk to commercial fishing vessels	✓	✓	✓	See volume 2, chapter 12: Shipping and navigation of the PEIR.	Negligible – Medium	Low – High	Negligible – Moderate	See volume 2, chapter 12: Shipping and navigation of the PEIR.		



**Table 11.42: Summary of potential cumulative environmental effects, mitigation and monitoring.**

<sup>a</sup> C=construction, O=operation and maintenance, D=decommissioning

Description of effect	Phase <sup>a</sup>			Measures adopted as part of the project	Magnitude of impact	Sensitivity of the receptor	Significance of effect	Further mitigation	Residual effect	Proposed monitoring
	C	O	D							
<b>Tier 2</b>										
Loss or restricted access to fishing grounds	✓	✓	✓	Same as described for the same impact in Table 11.7.	Scallop vessels – Scottish west coast C: Low O: Moderate D: Low	Scallop vessels – Scottish west coast C: Medium O: Medium D: Medium	Scallop vessels – Scottish west coast C: Minor O: Moderate D: Minor	O: Options to increase the minimum distance between WTGs and options to align the turbines with orientations of fishing tows are being explored by the Applicant.	Not assessed for PEIR as further mitigation is to be considered and included as part of the DCO application (see section 11.14).	O: Annual review for the first five years of the operational phase, to review VMS and landings data to identify whether there are any changes to fishing activity within the Morgan Array Area
Interference with fishing activity	✓	✓	✓	Same as described for the same impact in Table 11.7.	Offshore static gear vessels C: Low O: Low D: Low	Offshore static gear vessels C: Medium O: Medium D: Medium	Offshore static gear vessels C: Minor O: Minor D: Minor	None	None	None
Loss or damage to fishing gear due to snagging	✓	✓	✓	Same as described for the same impact in Table 11.7.	Scallop vessels – Scottish west coast C: Negligible O: Negligible D: Negligible	Scallop vessels – Scottish west coast C: High O: High D: High	Scallop vessels – Scottish west coast C: Minor O: Minor D: Minor	None	None	Monitoring of the cables and their burial status to reduce snagging risk.
Potential impacts on commercially important fish and shellfish resources	✓	✓	✓	As described in volume 2, chapter 8: Fish and shellfish ecology of the PEIR	Low – Medium	Negligible – Medium	Negligible – Minor	None	Negligible	None at this stage
Increased collision and allision risk to commercial fishing vessels	✓	✓	✓	See volume 2, chapter 12: Shipping and navigation of the PEIR.	Low – Medium	Low – High	Minor - Major	See volume 2, chapter 12: Shipping and navigation of the PEIR.		

## 11.14 Next steps

- 11.14.1.1 A number of significant effects on commercial fisheries receptors for the individual and cumulative assessments were identified. Therefore, additional mitigation is required to reduce impacts.
- 11.14.1.2 The Applicant has committed to exploring these additional mitigation measures through further studies and engagement with stakeholders to ensure they are appropriate and adequate for reducing impacts prior to submission of the DCO application. Appropriate mitigation measures will then be secured through the DCO or marine licenses.
- 11.14.1.3 Additionally the Applicant has committed to mitigation around array area boundary changes and lines of orientation to reduce potential impacts on shipping and navigation. These are relevant to commercial fisheries and will be incorporated into the assessment within the Environmental Statement. These commitments are set out within volume 2, chapter 12: Shipping and navigation of the PEIR.
- 11.14.1.4 Engagement with commercial fisheries stakeholders will continue, with further engagement to discuss the proposed layout design. Monitoring of fishing activity within the commercial fisheries study area will continue to inform the baseline. Additional information collected from surveys in 2023 and additional MMO landing data for 2021 and 2022, if available, will be used to inform the Environmental Statement. The baseline description and impact assessments in this chapter will therefore be updated for the final Environmental Statement. Comments received on the PEIR will be addressed within the Environmental Statement.

## 11.15 References

ABPmer (2021) EU-UK Trade and Cooperation Agreement. Thoughts on fisheries from a UK perspective. White Paper.

Blyth-Skyrme, R.E. (2010). Options and Opportunities for Marine Fisheries Mitigation associated with Windfarms. Final report for Collaborative Offshore Wind Research into the Environment Ltd. Accessed January 2022. Available at: <https://tethys.pnnl.gov/sites/default/files/publications/Blyth-Skyrme-2010.pdf>

DECC (Department of Energy and Climate Change). (2016) Offshore Energy Strategic Environmental Assessment 3 (OESEA 3). Available at: <https://www.gov.uk/government/consultations/uk-offshore-energy-strategic-environmental-assessment-3-oesea3>. Accessed January 2022.

Department of Energy and Climate Change (DECC) (2011a) Overarching National Policy Statements for Energy (NPS EN-1). Available: [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/47854/1938-overarching-nps-for-energy-en1.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/47854/1938-overarching-nps-for-energy-en1.pdf) . Accessed April 2022.

Department of Energy and Climate Change (DECC) (2011b) National Policy Statement for Renewable Energy Infrastructure. Available: [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/47856/1940-nps-renewable-energy-en3.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/47856/1940-nps-renewable-energy-en3.pdf) . Accessed April 2022.

Department of Energy and Climate Change (DECC) (2011c) National Policy Statements for Electricity Networks Infrastructure (NPS EN-5). Available:

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/47858/1942-national-policy-statement-electricity-networks.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/47858/1942-national-policy-statement-electricity-networks.pdf) . Accessed April 2022.

Duncan, P. and Emmerson, J. (2018) Commercial Fisheries & Sea Angling. In: Manx Marine Environmental Assessment (2nd Ed.). Isle of Man Government. 71 pp

Dunkley, F. and Solandt, J.L. (2022). Windfarms, fishing and benthic recovery: Overlaps, risks and opportunities. Marine Policy. 145.

EU STECF (Scientific, Technical and Economic Committee for Fisheries) (2017) Fisheries Dependent Information: Landings and effort (hours fished) data 2018. Available at: <https://stecf.jrc.ec.europa.eu/dd/effort/graphs-quarter>. Accessed January 2022.

FLOWW (Fishing Liaison with Offshore Wind and Wet Renewables Group) (2014). Best Practice Guidance for Offshore Renewables Developments: Recommendations for Fisheries Liaison. Fishing Liaison with Offshore Wind and Wet Renewables. Accessed January 2022. Available at: <https://www.sff.co.uk/wp-content/uploads/2016/01/FLOWW-Best-Practice-Guidance-for-Offshore-Renewables-Developments-Jan-2014.pdf>

FLOWW (Fishing Liaison with Offshore Wind and Wet Renewables Group) (2015). Best Practice Guidance for Offshore Renewables Developments: Recommendations for Fisheries Disruption Settlements and Community Funds. Fishing Liaison with Offshore Wind and Wet Renewables. Accessed January 2022. Available at: <https://www.thecrownestate.co.uk/media/1776/floww-best-practice-guidance-disruption-settlements-and-community-funds.pdf>

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

Highways England, Transport Scotland, Welsh Government, Department for Infrastructure (2019) Design Manual for Roads and Bridges (DMRB) LA 104, Environmental assessment and monitoring, Revision 1, Available at: <https://www.standardsforhighways.co.uk/prod/attachments/0f6e0b6a-d08e-4673-8691-cab564d4a60a?inline=true> Accessed April 2022.

International Cable Protection Committee (ICPC) (2009) Fishing and Submarine Cables – Working Together. Available at: <https://www.iscpc.org/documents/?id=142>

MarineTraffic (2022) Global Ship Tracking Intelligence. Available at: [www.marinetraffic.com](http://www.marinetraffic.com). Accessed May 2022.

MMO (Marine Management Organisation). (2020a) UK fleet landings by ICES Rectangle (2010-2020). Available at: <https://www.data.gov.uk/dataset/2a2ef8aa-1ddf-4551-b4c5-f5d3611216a4/united-kingdom-fleet-landings-by-ices-rectangle-2010> Accessed January 2022.

MMO (Marine Management Organisation). (2021a) Fish Landings to UK Ports. Available at: <https://environment.data.gov.uk/dataset/229f21dc-9e8e-4e48-95db-f81bcfc13caa>. Accessed January 2022.

MMO (2021b), North West Inshore and North West Offshore Marine Plan. Accessed June 2022.

NRW (Natural Resource Wales) (2010) Sea Fishing Atlas of Wales. Provided by NRW via email 2018.

NW IFCA (North Western Inshore Fisheries and Conservation Authority). Accessed October 2022. Available at: <https://www.nw-ifca.gov.uk/managing-sustainable-fisheries/nephrops-norvegicus/>

**MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS**

---

Roach, M. and Cohen, R. (2015) Westernmost Rough Fish & Shellfish Monitoring Report 2015; Including Comparison to Baseline Data 2013. Accessed January 2022. Available at: [https://www.researchgate.net/publication/344026116\\_Westernmost\\_Rough\\_Fish\\_Shellfish\\_Monitoring\\_Report\\_2015\\_Including\\_Comparison\\_to\\_Baseline\\_Data\\_2013\\_A\\_study\\_conducted\\_for\\_DON\\_G\\_Energy](https://www.researchgate.net/publication/344026116_Westernmost_Rough_Fish_Shellfish_Monitoring_Report_2015_Including_Comparison_to_Baseline_Data_2013_A_study_conducted_for_DON_G_Energy)

Roach, M., Reville, A. and Johnson, M.J. (2022). Co-existence in practice: a collaborative study of the effects of the Westernmost Rough offshore wind development on the size distribution and catch rates of a commercially important lobster (*Homarus gammarus*) population. ICES Journal of Marine Science 79(4):1,175-1,186.

Salthouse, C. (2021) The Future and Changing Context of the Irish Sea in 2020s. Irish Sea Maritime Forum, 9-87.

The Planning Inspectorate (2017) Advice Note ten, Habitat Regulations Assessment relevant to Nationally Significant Infrastructure Projects. Version 8. Available: <https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-ten/>. Accessed April 2022.

United Kingdom Fisheries Economics Network (UKFEN) (2012) Best Practice Guidance for Fishing Industry Financial and Economic Impact Assessments. Available at: <https://www.seafish.org/search/documents/>