Natura Impact Statement and Appropriate Assessment Screening Report

Volume 1 – Offshore

Sceirde Rocks Offshore Wind Farm, Co. Galway

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1. INTRODUCTION

1.1 Background

MKO, Xodus and Cork Ecology have been appointed to provide the information necessary to allow the competent authority to conduct an Article 6(3) Appropriate Assessment under the Habitats Directive of both the Offshore Site and Onshore Site of the proposed Sceirde Rocks Offshore Wind Farm, hereafter referred to as the 'the Project'.

The current Project is not directly connected with, or necessary for, the management of any European Site and as such, Screening for Appropriate Assessment is required under Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (the Habitats Directive). Where a plan or a project has a likely significant effect (LSE) on a qualifying interest (QI) of a European Site, the plans of project shall be subject to an Appropriate Assessment of its implications for the site in view of the site's conservation objectives. The Appropriate Assessment is carried out by the competent authority, in this case An Bord Pleanála, before planning permission for the Project can be granted. The Appropriate Assessment assesses whether based on objective scientific information a project or plan, either alone or in combination with other projects or plans, would have an adverse effect on the integrity of a European Site. Screening for Appropriate Assessment and Appropriate Assessment (NIS) is completed pursuant to the Part XAB Planning and Development Act 2000, as amended.

The Natura 2000 network in Ireland is made up of European Sites which include:

- Candidate site of Community Importance
- Site of Community Importance
- Special Area of Conservation (SAC)
- Special Protection Areas (SPA)
- Candidate Special Areas of Conservation (cSAC)
- Candidate Special Protection Areas (cSPA).

This Natura Impact Statement (NIS) have been prepared in accordance with the European Commission's Assessment of Plans and Projects Significantly affecting Natura 2000 Sites: Methodological Guidance on the provisions of Article 6(3) and 6(4) of the Habitats Directive 92/43/EEC (EC, 2021) and Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC (EC, 2018) as well as the Department of the Environment's Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities (DoEHLG, 2010).

In addition to the guidelines referenced above, the following relevant documents were also considered in the preparation of this report:

a) Council of the European Commission (1992) Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora. Official Journal of the European Communities. Series L 20, pp. 7-49.
b) EC (2007) Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC – Clarification of the concepts of: alternative solutions, imperative reasons of overriding public interest, compensatory measures, overall coherence. Opinion of the commission.
c) EC (2013) Interpretation Manual of European Union Habitats. Version EUR 28. European Commission.

1.2 Scope of the Document

Where the 'Project' is referred to, this encompasses the entirety of the project for the purposes of this document and includes both the 'Offshore Site' and 'Onshore Site'. The Project is fully described in the

Appropriate Assessment Screening Report and its annexes which is attached as Appendix 1 of this volume of the NIS.

For the purpose of this document, the Offshore Site refers to the Offshore Array Area (OAA), Offshore Substation (OSS), as well as the Offshore Export Cable (OEC), the Offshore Export Cable Corridor (OECC), and the Landfall. The description of the Offshore Site is set out and described in further detail in Section 0 below.

This volume of the NIS will assess the European Sites within the zone of influence of the Offshore Site of the Project. Details on the onshore part of the Project and associated elements are detailed in the AA Screening report and the Onshore NIS in Volume 2.

1.3 Statement of Authority

The production of this volume of the NIS was overseen, and reviews carried out by Ewan Edwards, Louise Davis, Anni Mäkelä and Colin Barton. Ewan Edwards is an Environmental Specialist at Xodus. He has 16 years of professional experience investigating human impacts on marine species, with a particular interest in marine mammals and seabirds. Prior to joining Xodus, Ewan was the lead renewables science adviser within Scottish Government's Marine Directorate, with a key advisory role on a range of offshore wind projects. He led the delivery of environmental advice to the marine industries regulator and routinely advised on Habitats Regulations Appraisal/Assessment (HRA) related to the Habitats Directive, including Hornsea Three Wind Farm Site Integrity Plan, Culzean Offshore Wind Turbine HRA Screening and Report to Inform Appropriate Assessment, West of Orkney Wind Farm Report to Inform Appropriate Assessment, and Cenos Offshore Windfarm Report to Inform Appropriate Assessment.

Louise Davis is an Environmental and Renewables Specialist at Xodus. She has 17 years professional experience in the environmental and renewables sectors and is a Practitioner member of the Institute of Environmental Management and Assessment (PIEMA) and a qualified ISO9001 internal quality auditor. Louise has had a lead role in over 7 gigawatts (GW) of renewable energy projects, applying her project management and technical knowledge of onshore and offshore consents, including preparation of Habitat Regulations Appraisal reports.

Anni Mäkelä is a Principal Environmental Consultant as Xodus. She has 13 years of experience in marine research, government, and consultancy roles. Prior to joining Xodus, she worked at Scottish Government's Marine Directorate – Licensing Operations Team as a Marine Licensing Group Leader, leading a team responsible for determining marine licence applications on behalf of the Scottish Ministers, including overseeing the preparation of Appropriate Assessments by the regulator.

Colin Barton of Cork Ecology has worked as an independent consultant for offshore wind projects since 2001, specialising in all aspects of ornithology. He has provided ornithological support and advice for several offshore wind projects in Irish and UK waters, with key inputs including the writing of EIAR ornithology chapters, ornithological input into HRA/NIS documents, advising on all aspects of survey design and post-construction monitoring. Colin graduated from the University of Aberdeen in 1992, with a BSc. Honours degree in Biology (Ecology) in 1992.

1.3.1 Natura Impact Statement (NIS) technical authorship

The assessment for European Sites designated for Annex I habitats and (diadromous) fish and associated features has been prepared by Darcy Brady. Darcy is an Environmental Consultant with Xodus Group with around three years of industry experience. Holding a BSc (Hons) in Ocean Science and Marine Conservation from the University of Plymouth, and an MSc (Distinction) in Marine Conservation from the same institution, Darcy has contributed to various offshore environmental impact assessments related to offshore wind projects, electrification, and submarine cable scopes. Primarily involved in the pre-consent stages of EIA for offshore wind development, focusing on round

3, 4, and ScotWind projects, Darcy has key technical skills and experience in evaluating impacts on benthic subtidal and intertidal ecology and fish and shellfish ecology. Darcy has extensive experience in authoring and reviewing a variety of EIA and HRA documents, with particular expertise in gathering and analysing relevant datasets to establish technical baselines and conduct precise impact assessments.

The assessment for European Sites designated for marine mammal features has been prepared by Monika Kosecka. Monika, Lead Environmental Consultant at Xodus Group, is a marine mammal and underwater noise specialist with 14 years of professional experience, including marine mammal and fish acoustic studies, policy and commercial advisory roles. She is a co-author of several peer reviewed publications on marine mammals, underwater noise and its impacts on marine life and specialises in marine mammal ecology within Xodus. She holds MSc in Oceanography.

The assessment for European Sites designated for ornithological features has been authored by Shona Morrison. Shona is an Environmental Consultant with Xodus Group, having joined the company in 2021 after graduating with an MSc (Merit) in Marine Renewable Energy from Heriot-Watt University. Shona has also obtained a BSc (Hons) in Marine and Freshwater Biology from Edinburgh Napier University. Shona has experience across a number of different projects including offshore wind farms, tidal arrays, and cable scopes, including authoring of ornithological chapters to EIAs and contributing to preparation of HRA documents.

Colin Barton of Cork Ecology has worked as an independent consultant for offshore wind projects since 2001, specialising in all aspects of ornithology. He has provided ornithological support and advice for several offshore wind projects in Irish and UK waters, with key inputs including the writing EIAR ornithology chapters, ornithological input into HRA/NIS documents, advising on all aspects of survey design and post-construction monitoring. Colin graduated from the University of Aberdeen in 1992, with a BSc. Honours degree in Biology (Ecology) in 1992.

1.4 Methodology

1.4.1 Appropriate Assessment Screening

The first step of the appropriate assessment process considered which European Sites could have potential connectivity to the Offshore Development due to source-pathway-receptor model, and if there is potential LSE on any European Sites as a result of the construction, operations and maintenance and decommissioning of the Offshore Site. This assessment has been carried out and can be found in Appendix 1. Where potential connectivity was identified in the Appropriate Assessment Screening Report in respect of European Sites they have been assessed in this volume of the NIS (NIS Volume 1 – Offshore). All European Sites within the ZoI detailed in the Appropriate Assessment Screening Report were considered in the initial screening stage.

These sites were then examined to establish if LSE could be established on the European Sites as a consequence of the Offshore Site and the Onshore Site – i.e. the Project. Where LSE was concluded based on likely potential impact pathways, the site was carried forward to Stage 2 – NIS.

1.4.2 NIS

Article 6(3) of the Habitats Directive 92/43/EEC (EC, 2021) states that any plan or project not directly connected with or necessary to the management of the (European) site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives.

The NIS assesses whether there are adverse effects from the Offshore Site in cumulation with the Onshore Site - i.e. the Project - on the integrity of any European Sites where potential for LSE was identified in the Appropriate Assessment Screening Report, either individually or in combination with other plans or projects, in light of the European sites' conservation objectives, and the mitigation applied.

1.4.3 In-cumulation Assessment

Whilst this NIS assesses whether the Offshore Site will have an adverse effect on the integrity of the screened in European Sites, the in-cumulation assessment considers the potential for adverse effects on the integrity of European Sites as a result of the cumulation of both the Onshore Site and Offshore Site i.e. the Project.

1.4.4 In-combination Assessment

As well as considering effects from the Project alone, the Habitats Directive require a consideration of potential effects on the integrity of European sites arising from the Project in combination with other plans or projects.

A search and review was conducted across various platforms, databases and portals to compile a list of other plans (National, Regional and local) and projects that may have the potential to result in in combination impacts on European Sites was conducted. This included a review of online Planning Registers, development plans and other available information and served to identify past and future plans and projects, their activities and their predicted environmental effects.

The in-combination assessment will consider projects that are 'reasonably foreseeable' such as:

- Existing projects either built or in construction;
- Approved projects, awaiting implementation; and
- Proposals awaiting determination within the planning process with design information in the public domain.

Other offshore activities and industries that have been considered include:

- Marine renewables (offshore wind, wave and tidal);
- Coastal projects, including but not limited to port and harbour projects;
- Marine aggregate extraction, dredging and licensed disposal sites;
- Oil and gas activities;
- Carbon capture and storage; and
- Subsea cables and pipelines.

A staged approach was undertaken to identify relevant in-combination projects, plans and activities for consideration within the NIS.

- Step 1: Compilation of the plans and project long-list:
  - First, a 'long list' of plans and projects was collated, based on defined ZoIs for each QI. The ZoIs provide the maximum search areas for other projects to be screened into the in-combination project long list. Operational projects were only be screened into the long list if there is considered to be the potential for an ongoing effect from that project type (e.g. bird collision risk). For most receptors, operational projects were considered to be part of the existing baseline, considered as part of the offshore / onshore project-specific effect assessment and are therefore not considered within the in-combination effect assessment.

- Step 2: Compilation of plans and project short-list:
  - This long list was then be reduced to a short-list by taking potential pathways of effect (e.g. temporal and physical overlap of effects) into account.

Additional information was gathered on each project within the project long list, to understand the activities, timescales and nature of the projects within the long list. This additional information was then be reviewed to determine the potential channels for in-combination effect, taking into consideration potential effect pathways and / or the potential for physical or temporal overlap of effects from other project activities and those of the project. The most up-to-date publicly available information in relation to the relevant project parameters was used to inform the in-combination assessment.

- No plans were identified during step 1 that could contribute to any in-combination effects with the Offshore Site of the Project. As such, only projects that could potentially lead to in-combination impacts were considered further in step 2 short list.
- For Offshore Ornithology it was concluded that as there are no operational, consented or submitted OWF projects within 509.4 km of the Project it is considered that there will be no in-combination effects with other OWF projects on SPAs with breeding seabird QIs arising in the breeding season. The 509.4 km distance is the breeding season mean maximum (+1S.D.) foraging range for gannet, and this is considered appropriate to use here as gannet is considered a key species in terms of potential collision and displacement impacts. Although other species such as Manx shearwater and fulmar have larger foraging ranges during the breeding season, these species are not considered to be at risk of potential displacement or collision effects, based on reviews of evidence from operational OWFs (e.g. Dierschke et al., 2016). Similarly in the non-breeding season, when seabirds are not linked to their breeding colonies, it is considered that the distance between Projects and other operational, consented or submitted OWF projects will make the potential for any significant in-combination interactions very unlikely. Therefore, in-combination effects between the Project and other operational, consented or submitted OWF projects in Irish and west coast UK or more distant projects do not require further assessment due to lack of likely significant effects.

1.5 Structure and Format of this Document

This volume of the NIS (NIS Volume 1 – Offshore) assesses the European Sites relevant to the Offshore Development. Details on the onshore part of the Project and associated elements are provided in the NIS Volume 2 - Onshore. The structure of this volume is explained in Table 1-1 below.

Table 1-1 Structure and format of this document

Section Number	Section Title	Description
1	Introduction	Provides background on the Offshore Site and Onshore Site of the proposed Sceirde Rocks Offshore Wind Farm (‘the Project’) and the assessment methods and authorships of the NIS.
2	Description of Proposed Offshore Site	Provides a description of the Offshore Site, including site location, summary of the characteristics of the Offshore Site. The description of the Offshore Site is a summary and should be read in conjunction with the Appropriate

Section Number	Section Title	Description
		Assessment Screening Report and its annex, attached here as Appendix 1.
3	Appropriate Assessment Screening outcome	Summarises the findings of the Appropriate Assessment Screening Report (Appendix 1) that identified where potential for LSE on European Sites was identified and which will be assessed further in the NIS.
4	NIS	Describes the process taken to determine whether the Offshore Site, either alone or in combination with other projects or plans, will have LSE on European Sites and if so, would have an adverse effect on the integrity of European Sites. The NIS also describes the mitigation that will be employed to avoid any adverse effect on site integrity. The NIS considers - the conservation objectives of the European Sites taking account of its measures, attributes and targets; - the relevant impact pathways for each QI and site; - assessment of potential adverse effect on site integrity in view of the site's conservation objectives; - Assessment of Residual and in-cumulation adverse effects - in combination assessment; and - Description of mitigation
6	Concluding Statement	Summarises the findings of the NIS.

2. DESCRIPTION OF PROPOSED OFFSHORE SITE

2.1 Offshore Site Location

The Offshore Site is located seaward of the High-Water Mark (HWM). The Onshore Site is located landward of the Low Water Mark (LWM). The OAA is approximately 37.2 kilometre^2 (km^2) in area and is located between 5 – 11.5 km from the coastline of County Galway. The OECC is approximately 62 km in length and 1 km wide. The 220 kV OEC has a total length of approximately 63.5 km (from OSS to the Transition Joint Bay (TJB)), the majority of which lies within the OECC in addition to short sections within the OAA and within the trenchless landfall duct. The Offshore Site is shown in Figure 2-1.

The OEC will make Landfall at Killard, County Clare. The OEC will be brought ashore via a trenchless technology duct and will be connected to the Onshore Grid Connection (OGC) at a TJB located on land, within the Onshore Site. The OGC is connected to a 220 kV Onshore Compensation Compound at Ballymacrinan, County Clare and continues to connect to the national electricity grid at the 220 kV substation at Moneypoint, Co. Clare. Details on the onshore part of the Project and associated elements are detailed in Appendix A of Appendix 1 – Onshore Appropriate Assessment.

All distances to any SACs are measured based on the nearest distance to the boundary of the Offshore Site, i.e. OAA or OECC boundary. For SPAs and bird QIs, the distances presented are "round the coast as the seabird flies" between the centre of the SPA and the centre of the OAA, and not straight-line distance (Appendix 7).

2.2 Environmental baseline

Although the Offshore Site lies in generally coastal waters between Co. Galway and Co. Clare, the Offshore Site is highly exposed to the prevailing wind from the west and southwest. Depths range from exposed rocks within the OAA, to ca. 90 metres where the OECC passes close to Inis Mor.

The Offshore Site has been designed so as to avoid overlapping any European Site. However, there are numerous European sites in the vicinity of the Offshore Site. These include SACs for the protection of Annex I seabed habitats; SACs for the protection of marine mammals, and SPAs for the conservation of seabirds, waders and migratory/wintering birds. This includes several Qualifying Interests (QI) which are considered to be highly mobile, such as birds and marine mammals, where connectivity has been determined (e.g. due to the breeding season foraging range of seabirds, or the wide-ranging behaviour of marine mammals).

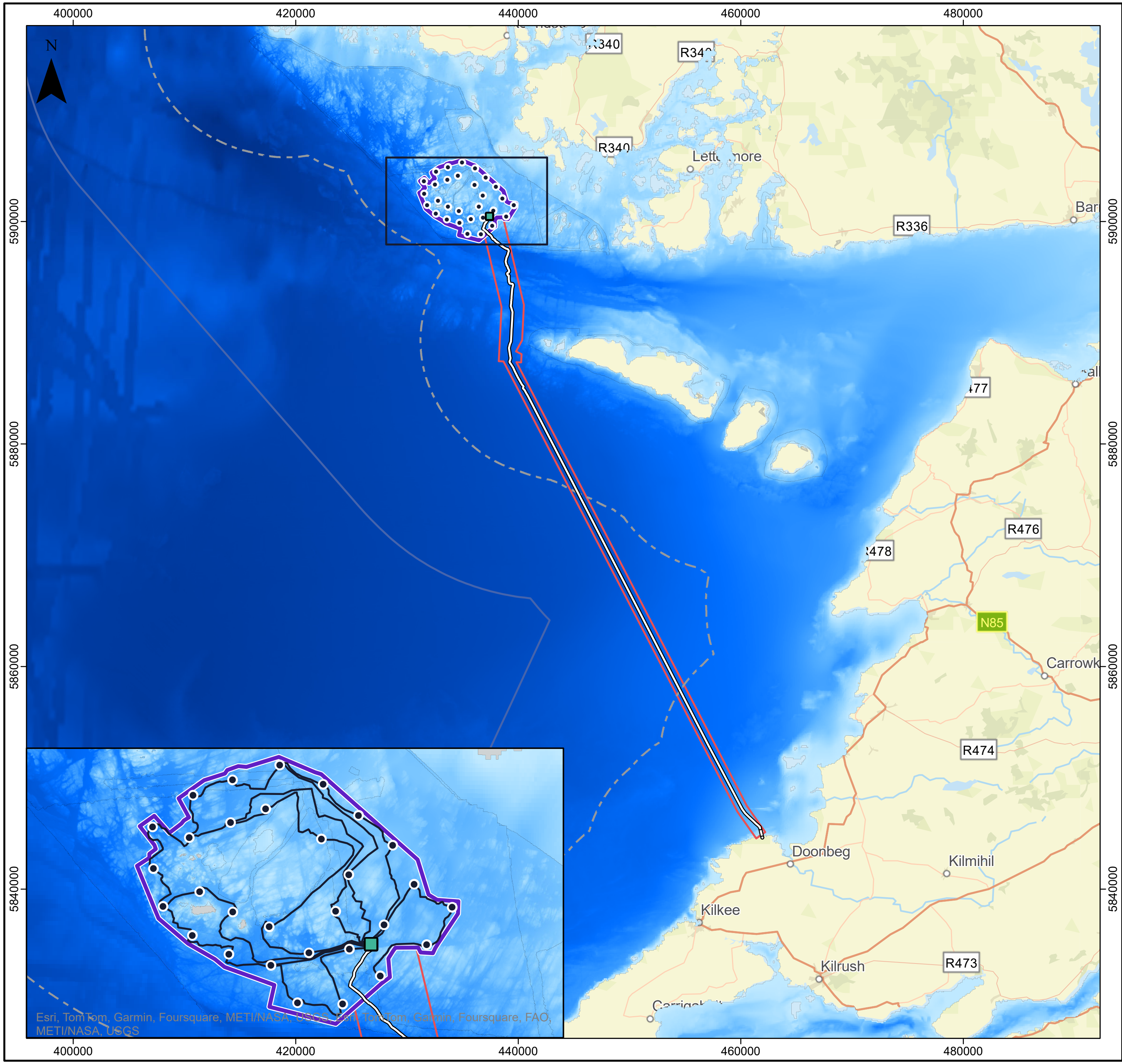
The Project undertook baseline characterisation surveys, including digital aerial surveys for birds and mammals. These surveys indicated the presence of several bird and mammal species that are qualifying interests of European Sites with connectivity with the Offshore Site (see Section 2.3).

As no SACs for benthic qualifying interests overlap with the Offshore Site, no site-specific surveys were undertaken within those SACs, although the marine surveys of the Kilkieran Bay, Skerd Rocks and Aran Islands indicate a range of littoral, infralittoral and sublittoral habitat types ranging from bedrock to soft sediments, with a composition generally representative of the range of species and habitats west of Ireland, including algae, reefs with encrusting epifauna, sediments with associated infauna and demersal mobile invertebrates such as crustaceans (Sides et al., 1994). Surveys carried out in within the Offshore Site are set out in further detail in Section 2.3 below.

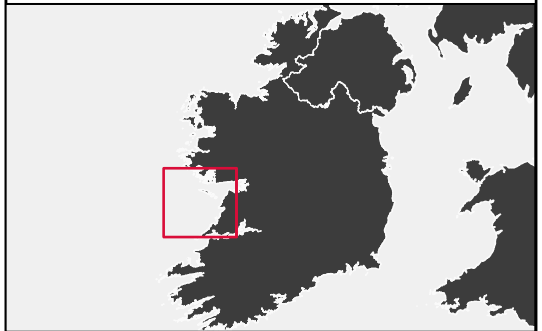
Diadromous fish, specifically Atlantic salmon, spawn and live in several rivers around the wider Galway Bay region. Salmon migrate to sea as smolts around 4-5 years old before returning after one or more winters at sea, as breeding adults. Some salmon are likely to pass through the Offshore Site en route to/from marine feeding grounds. The at-sea movements of salmon (and other diadromous fish) are poorly understood, nevertheless it is likely that there is connectivity between salmon SACs in Co. Galway and Co. Clare and the Offshore Site and that likelihood has been taken account of in the AASR and this volume of the NIS .

2.3 Site Surveys

Site surveys were carried out across the Offshore Site to inform the baseline characterisation for benthic, fish and shellfish, marine mammals and ornithology receptors. A geophysical survey was carried out by EGS International Limited in mid-2022, followed by a benthic characterisation survey undertaken by Ocean Ecology Limited in October 2023. The benthic characterisation survey included both sediment and water sampling to inform macrofaunal analyses, chemical analyses and particle size distribution. Additionally, environmental DNA (eDNA) sampling was undertaken. HiDef Aerial Surveying Limited completed two-years of monthly Digital Aerial Surveys (DAS) spanning October 2021 to September 2023 which was used to inform the baseline for marine mammals and marine ornithological receptors (HiDef, 2024). Digital aerial surveys are one of the recommended survey methods in the DCCAE Guidance, as they can cover a large area over a short period (DCCAE, 2018a&b), and have been demonstrated to be highly effective at detecting birds and marine mammals (Thompson *et al.*, 2012; Williamson, 2016; Mendel *et al.*, 2018).



SCEIRDE ROCKS WINDFARM
Feirm Ghaoithe Charraigeacha Sceirde



LEGEND

- Offshore Array Area
- Offshore Export Cable Corridor
- Ireland 6 NM limit
- Ireland 12 NM Limit
- Extent of Inset Map
- Offshore Export Cable
- Inter Array Cable Routes
- Offshore Substation (OSS)
- Wind Turbine Generators (WTG)

Bathymetry (m)
0
-130

0 3 6 nm
0 6 12 km

Data Source: Contains public sector information, licensed under the Creative Commons licence v4.0; the Open Government Licence v3.0. INFOMAR 2021 & 2022.

PROJECT TITLE
Sceirde Rocks

MAP TITLE
Offshore Site

VER	REMARKS	DATE	Drawn	Approved
1	DRAFT	06/12/2024	BQ	EE

DRAWING NO
Figure 2-1

SCALE	PAPER SIZE	DATUM	PROJECTION
1:500,000	A4	WGS 84	UTM 29N

2.4 Characteristics of the Project

The proposed Sceirde Rocks Offshore Wind Farm comprises both an Offshore and Onshore component, as described below. These are collectively referred to as 'the Project'. A full description of the Project is detailed in Appendix B of Appendix 1.

The Project will consist of the provision of the following:

Offshore Development:

I. 30 no. offshore Wind Turbine Generators (WTGs) with gravity based fixed-bottom foundations with the following details:
   - Tip height of 324.9m above Lowest Astronomical Tide (LAT),
   - Rotor diameter of 292m;
   - Hub height of 178.9m above LAT;

II. 1 no. 220kV offshore substation (OSS) of 55 m in height above LAT (including crane and communications mast) with a gravity based fixed bottom foundation. The OSS consists of an offshore electrical substation platform with multiple decks accommodating the electrical and communications plant and equipment, ancillary components and welfare facilities;

III. A network of inter-array electrical and communication cables, of approximately 73 km in length, connecting the 30 WTGs to the OSS;

IV. A 220kV offshore export cable complete with communication lines, of approximately 63.5 km in length, laid in and on the seabed from the OSS to landfall in the townland of Killard, Co. Clare;

V. Seabed preparation for WTG, OSS and cable installation including rock placement, dredging and disposal;

VI. Cable protection including trenching and burial, rock berms, and concrete mattresses.

Onshore Development:

I. An underground Transition Joint Bay (TJB) at the landfall point in the townland of Killard, Co. Clare connecting the offshore export cable to the onshore grid connection cable. The TJB consists of an underground concrete chamber (20m x 5m wide, with a depth of 2.5m), where the proposed offshore export cable will be connected to the onshore grid connection cable;

II. 220kV onshore grid connection and communications cables laid underground, primarily in the public road corridor with small sections in third party lands, for approximately 19.3 km between the TJB in the townland of Killard, Co. Clare and the new 220kV Onshore Compensation Compound (OCC) in the townland of Ballymacrinan, Co. Clare;

III. 220kV onshore grid connection and communication cables laid underground, primarily in the public road corridor with small sections in third party lands, for approximately 3 km between the new 220kV OCC in the townland of Ballymacrinan, Co. Clare and the existing Moneypoint 220kV substation in the townland of Carrowdotia South, Co. Clare;

IV. 43 no. joint bays complete with communication chambers and link box chambers along the onshore grid connection route between the TJB in the townland of Killard, Co. Clare to the existing 220kV Moneypoint substation in the townland of Carrowdotia South, Co. Clare;

V. A 220kV Onshore Compensation Compound located in the townland of Ballymacrinan, Co. Clare. The 220kV onshore compensation compound consists of:
   - Eirgrid 220kV GIS Building (49m x 18.5m, with a total height of 16.7m above Finished Floor Level (FFL);
   - ESB 220kV GIS Building (49m x 18.5m, with a total height of 16.7m above FFL);
   - Customer SCADA and MV power building (18.4m x 8.7m, with a total height of 6.15m above FFL);
   - Statcom building (30.5m x 22m, with a total height of 7.59m above FFL);

- Upgrade of existing entrance onto the L-6150 including the removal of a small portion of existing stone wall and hedgerow;
- All associated electrical and communications plant and equipment, welfare facilities, 3 no. foul water holding tanks, 3 no. bored wells, 3 no. attenuation tanks, access roads, car parking, security fencing and gates, rail and post fencing, telecommunications pole, lightning masts, signage, safety bollards, landscaping, drainage infrastructure and all other ancillary works and associated site development works;

VI. 3 no. temporary construction compounds along the onshore grid connection cable route:
- 1 no. temporary construction compound at the landfall point in the townland of Killard Co. Clare;
- 1 no. temporary construction compound at the Kilrush Golf Club in the townland of Parknamoney, Co. Clare;
- 1 no. temporary construction compound at the new 220kV OCC in the townland of Ballymacrinan, Co. Clare;

VII. Reinstatement of the road or track surface above the proposed onshore grid connection cable trench along existing roads and tracks;

VIII. New and upgraded access tracks above the proposed onshore grid connection cable trench in third party lands;

IX. Temporary entrances from public roads to facilitate construction of the onshore grid connection for construction phase only;

X. Provision of 3 no. passing bays and the widening of the L-6150 road in the townland of Ballymacrinan to facilitate the delivery of abnormal loads for the construction of the proposed OCC;

XI. All works associated with spoil management;

XII. All associated site works and ancillary development above and below ground including hard and soft landscaping, habitat enhancement and drainage infrastructure.

This application seeks a ten-year planning permission and a 38-year operational life from the date of commissioning of the Project.

Note, this volume of the NIS pertains only to the Offshore Site, but an overview of the Onshore Site is provided for context of the overall Project and for the purpose of the in-cumulation and in-combination assessments.

2.5 Construction Programme

A summary of the phases of the Offshore Site construction programme is shown in Table 2-1. The construction programme and durations of the campaigns are subject to change depending on factors such as contractor / vessel availability, ground and weather conditions and any supply chain or logistical issue that may arise.

Table 2-1 Offshore Site activities from pre-installation to commissioning

Activity	Description
Pre-construction surveys and site investigations	Additional pre-construction surveys may be undertaken, including geophysical, geotechnical, benthic, unexploded ordnance (UXO) and metocean investigations. Other surveys, e.g. environmental surveys, may also be undertaken as required.
Site preparation	Seabed preparations will be required prior to the installation of Gravity Base Structure (GBS) foundations and offshore cable infrastructure. This may include boulder clearance and UXO clearance. Site preparation works also include dredging at foundation locations and placement of rock to form a stonebed for GBS foundations and for WTIV operations.
GBS foundation and sub-substructure installation	The GBS foundations are proposed to be stored nearshore prior to installation at the OAA. Foundations will be towed to site and lowered into position ahead of the WTG and OSS topside structures.
OSS installation/commissioning	OSS topside structure is installed after the construction of the GBS foundation. Following installation of the OSS and connection to the inter-array and export cabling, a process of testing and commissioning will be undertaken.
Offshore export cable (OEC) – landfall and offshore installation	Following the completion of the necessary onshore works (including the necessary Landfall preparations) and the offshore site preparations, the OEC will be laid from the Landfall out to the OSS, with the potential for pre-trenching works to be undertaken ahead of cable installation. The OEC will be buried wherever possible and may be installed using jetting or trenching techniques. Following cable lay and burial (which may occur simultaneously or sequentially) external cable protection will be installed, as necessary. Cable protection, where required will consist of rock berms, concrete mattresses, cast-iron shells and rock/grout bags.
Inter-array cable (IAC) installation	The inter-array cables (IAC) will be installed between the WTGs and between WTGs and the OSS. The installation techniques for the IAC will be similar to that of the OEC.
WTG installation/commissioning	The WTGs will be marshalled onshore and transported to the OAA for installation. Following installation of the WTGs and connection to the IAC, a process of testing and commissioning will be undertaken.

The components, design parameters and proposed installation methods of the Offshore and Sites are described in detail in Appropriate Assessment Screening Report and its appendices, attached here as Appendix 1. Sections below outline and discuss the potential impacts arising from the Offshore Site construction, operations and maintenance and decommissioning, as they relate to the relevant QI.

3. IDENTIFICATION OF RELEVANT EUROPEAN SITES

The Offshore AASR (Appendix 1) concluded that the following European Sites had potential connectivity to the Project due to the sites being within ZoI for the Offshore Site. These sites are listed in Table 3-1 which includes a link to the relevant European Sites information available from NPWS along details of the relevant site conservation objectives for each site. All conservation objectives which are available have been considered, and where no CO for QIs are available, a proxy CO has been used. which based on our expert view is analogous to the European sites. The CO used in these cases is based upon the conservation objectives of the closest designated site with the same qualifying feature that has conservation objectives within the same Management Unit (MU). For all European Sites outside UK or Irish waters, a precautionary approach has been taken in this assessment and assumed a 'Restore to or maintain favourable conservation status' objective for the QI. The determination will be based upon the conservation objectives of the closest designated site with the same qualifying feature that has conservation objectives within the same MU.

Table 3-1 European Sites with potential connectivity to the Offshore Site of the Project

European site	Distance to Offshore Site for SACs and OAA for SPAs (km)	Site's conservation objectives	Qualifying Interest(s)	Justification for why the European Site has been screened in based on the ZoI for the relevant QI	Site screened in because they are considered to have potential for LSE? (Yes/ No)
Inishmore Island SAC	< 1 (adjacent with no overlap)	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO000213.pdf	**Coastal lagoons [1150]** **Reefs [1170]** Perennial vegetation of stony banks [1220] Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] Embryonic shifting dunes [2110] Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120] Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] Dunes with Salix repens ssp. argentea (*Salicion arenariae*) [2170] Humid dune slacks [2190] Machairs (* in Ireland) [21A0] European dry heaths [4030] Alpine and Boreal heaths [4060] Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210] Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis) [6510] Limestone pavements [8240] Submerged or partially submerged sea caves [8330] Vertigo angustior (Narrow-mouthed Whorl Snail) [1014] **Phocoena phocoena (Harbour Porpoise) [1351]**	**Annex I Habitats** – Considered further as this SAC is within the ZoI of 15 km; and **Harbour porpoise** – Considered further as this SAC is within the MU for harbour porpoise.	Yes
Mid-Clare Coast SPA	60.6	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004182.pdf	Cormorant (Phalacrocorax carbo) [A017] **Barnacle Goose (Branta leucopsis) [A045]** **Ringed Plover (Charadrius hiaticula) [A137]** **Sanderling (Calidris alba) [A144]** **Purple Sandpiper (Calidris maritima) [A148]** **Dunlin (Calidris alpina) [A149]** **Turnstone (Arenaria interpres) [A169]** **Wetland and Waterbirds [A999]**	Cormorant – No potential for LSE as this SPA is outside foraging range of 33.9 km; and **Barnacle Goose** - Considered further based on potential for collision on migration **Wader species** are considered further based on potential for collision on migration, and **Wetland and Waterbirds** – Considered further based on potential for surface water pollution.	Yes
Carrowmore Point to Spanish Point and Islands SAC	1.2	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO001021.pdf	**Coastal lagoons [1150]** **Reefs [1170]** Perennial vegetation of stony banks [1220] Petrifying springs with tufa formation (Cratoneurion) [7220]	**Annex I Habitats** – Considered further as this SAC is within the ZoI of 15 km.	Yes
Inishmore SPA	16	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004152.pdf	**Kittiwake (Rissa tridactyla) [A188]** **Arctic Tern (Sterna paradisaea) [A194]** **Little Tern (Sterna albifrons) [A195]** **Guillemot (Uria aalge) [A199]**	**Kittiwake** – Considered further as within foraging range of 300.6 km; **Arctic tern** - Considered further as within foraging range of 40.5 km; **Little tern** – Considered further as potential to pass through OAA on migration.	Yes

European site	Distance to Offshore Site for SACs and OAA for SPAs (km)	Site's conservation objectives	Qualifying Interest(s)	Justification for why the European Site has been screened in based on the ZoI for the relevant QI	Site screened in because they are considered to have potential for LSE? (Yes/ No)
				Guillemot - Considered further as within foraging range of 153.7 km.	
Kilkieran Bay and Islands SAC	1.4	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002111.pdf	**Mudflats and sandflats not covered by seawater at low tide [1140]** **Coastal lagoons [1150]** **Large shallow inlets and bays [1160]** **Reefs [1170]** **Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330]** **Mediterranean salt meadows (Juncetalia maritimi) [1410]** Machairs (* in Ireland) [21A0] Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea [3130] Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis) [6510] **Phocoena phocoena (Harbour Porpoise) [1351]** Lutra lutra (Otter) [1355] **Phoca vitulina (Harbour Seal) [1365]** Najas flexilis (Slender Naiad) [1833]	**Annex I Habitats** – Considered further as this SAC is within the ZoI of 15 km; **Harbour porpoise** – Considered further as this SAC is within the MU for harbour porpoise. **Harbour seal** – Considered further as this SAC is within the range for harbour seal (75 km); and Eurasian otter – No potential for LSE as the Offshore Site does not overlap with the boundary of the SAC.	**Yes**
Carrowmore Dunes SAC	1.5	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002250.pdf	**Reefs [1170]** Embryonic shifting dunes [2110] Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120] Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] Vertigo angustior (Narrow-mouthed Whorl Snail) [1014]	**Annex I Habitats** – Considered further as this SAC is within the ZoI of 15 km.	**Yes**
Slyne Head to Ardmore Point Islands SPA	6.7	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004159.pdf	**Barnacle Goose (Branta leucopsis) [A045]** **Sandwich Tern (Sterna sandvicensis) [A191]** **Arctic Tern (Sterna paradisaea) [A194]** **Little Tern (Sterna albifrons) [A195]**	**Barnacle Goose** – Considered further based on potential for collision on migration; **Sandwich Tern** – Considered further as potential to pass through OAA on migration; **Arctic tern** - Considered further as within foraging range of 40.5 km; and **Little tern** - Considered further as potential to pass through OAA on migration.	**Yes**
Kilkee Reefs SAC	2.4	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002264.pdf	**Large shallow inlets and bays [1160]** **Reefs [1170]** Submerged or partially submerged sea caves [8330]	**Annex I Habitats** – Considered further as this SAC is within the ZoI of 15 km.	**Yes**
Cruagh Island SPA	38.6	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004170.pdf	**Manx Shearwater (Puffinus puffinus) [A013]** **Barnacle Goose (Branta leucopsis) [A045]**	**Manx Shearwater** - Considered further as within foraging range of 2,365.5 km; and **Barnacle Goose** - Considered further based on potential for collision on migration	**Yes**
Connemara Bog Complex SAC	8.26	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004181.pdf	**Coastal lagoons [1150]** **Reefs [1170]** Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) [3110]	**Annex I Habitats** – Considered further as this SAC is within the ZoI of 15 km; **Atlantic salmon** – Considered further as this SAC is within the ZoI of 50 km; and	**Yes**

European site	Distance to Offshore Site for SACs and OAA for SPAs (km)	Site's conservation objectives	Qualifying Interest(s)	Justification for why the European Site has been screened in based on the ZoI for the relevant QI	Site screened in because they are considered to have potential for LSE? (Yes/ No)
			Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea [3130] Natural dystrophic lakes and ponds [3160] Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation [3260] Northern Atlantic wet heaths with Erica tetralix [4010] European dry heaths [4030] Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) [6410] Blanket bogs (* if active bog) [7130] Transition mires and quaking bogs [7140] Depressions on peat substrates of the Rhynchosporion [7150] Alkaline fens [7230] Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0] Euphydryas aurinia (Marsh Fritillary) [1065] **Salmo salar (Salmon) [1106]** Lutra lutra (Otter) [1355]1 Najas flexilis (Slender Naiad) [1833]	Eurasian otter – No potential for LSE as the Offshore Site does not overlap with the boundary of the SAC.	
Lower River Shannon SAC	8.75 (direct distance, at sea connectivity 15+ km)	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf	Sandbanks which are slightly covered by sea water all the time [1110] Estuaries [1130] Mudflats and sandflats not covered by seawater at low tide [1140] Coastal lagoons [1150] Large shallow inlets and bays [1160] Reefs [1170] Perennial vegetation of stony banks [1220] Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] Salicornia and other annuals colonising mud and sand [1310] Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330] Mediterranean salt meadows (Juncetalia maritimi) [1410] Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation [3260] Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) [6410] Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) [91E0] **Margaritifera margaritifera (Freshwater Pearl Mussel) [1029]** **Petromyzon marinus (Sea Lamprey) [1095]** Lampetra planeri (Brook Lamprey) [1096] **Lampetra fluviatilis (River Lamprey) [1099]** **Salmo salar (Salmon) [1106]** **Tursiops truncatus (Common Bottlenose Dolphin) [1349]** Lutra lutra (Otter) [1355]	Annex I Habitats – No potential for LSE as the at sea distance is outside the ZoI of 15 km; **Diadromous fish and freshwater pearl mussel** – Considered further as this SAC is within the ZoI of 50 km; **Bottlenose dolphin** – Considered further as this SAC is within the MU for bottlenose dolphin; and Eurasian otter – No potential for LSE as the Offshore Site does not overlap with the boundary of the SAC.	**Yes**

European site	Distance to Offshore Site for SACs and OAA for SPAs (km)	Site's conservation objectives	Qualifying Interest(s)	Justification for why the European Site has been screened in based on the ZoI for the relevant QI	Site screened in because they are considered to have potential for LSE? (Yes/ No)
River Shannon and River Fergus Estuaries SPA	104.6	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf	Cormorant (Phalacrocorax carbo) [A017] **Whooper Swan (Cygnus cygnus) [A038]** **Light-bellied Brent Goose (Branta bernicla hrota) [A046]** **Shelduck (Tadorna tadorna) [A048]** **Wigeon (Anas penelope) [A050]** **Teal (Anas crecca) [A052]** **Pintail (Anas acuta) [A054]** **Shoveler (Anas clypeata) [A056]** **Scaup (Aythya marila) [A062]** **Ringed Plover (Charadrius hiaticula) [A137]** **Golden Plover (Pluvialis apricaria) [A140]** **Grey Plover (Pluvialis squatarola) [A141]** **Lapwing (Vanellus vanellus) [A142]** **Knot (Calidris canutus) [A143]** **Dunlin (Calidris alpina) [A149]** **Black-tailed Godwit (Limosa limosa) [A156]** **Bar-tailed Godwit (Limosa lapponica) [A157]** **Curlew (Numenius arquata) [A160]** **Redshank (Tringa totanus) [A162]** **Greenshank (Tringa nebularia) [A164]** Black-headed Gull (Chroicocephalus ridibundus) [A179] **Wetland and Waterbirds [A999]**	Cormorant - No potential for LSE as this SPA is outside foraging range of 33.9 km; **Whooper swan** - Considered further based on potential for collision on migration; **Light-bellied Brent Goose** - Considered further based on potential for collision on migration; and **Wildfowl and wader species** are considered further based on potential for collision on migration. **Wetland and Waterbirds** – Considered further based on potential for surface water pollution; and Black-headed gull - No potential for LSE as not recorded in OAA on baseline surveys;	**Yes**
Inishmaan Island SAC	13.1	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO000212.pdf	**Reefs [1170]** Perennial vegetation of stony banks [1220] Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] Embryonic shifting dunes [2110] Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120] Machairs (* in Ireland) [21A0] European dry heaths [4030] Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210] Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis) [6510] Limestone pavements [8240]	**Annex I Habitats** – Considered further as this SAC is within the ZoI of 15 km.	**Yes**
Slyne Head Peninsula SAC	13.9	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002074.pdf	**Coastal lagoons [1150]** **Large shallow inlets and bays [1160]** **Reefs [1170]** Annual vegetation of drift lines [1210] Perennial vegetation of stony banks [1220] **Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330]** **Mediterranean salt meadows (Juncetalia maritimi) [1410]** Embryonic shifting dunes [2110]	**Annex I Habitats** – Considered further as this SAC is within the ZoI of 15 km; and **Bottlenose dolphin** – Considered further as this SAC is within the MU for bottlenose dolphin.	**Yes**

European site	Distance to Offshore Site for SACs and OAA for SPAs (km)	Site's conservation objectives	Qualifying Interest(s)	Justification for why the European Site has been screened in based on the ZoI for the relevant QI	Site screened in because they are considered to have potential for LSE? (Yes/ No)
			Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120] Machairs (* in Ireland) [21A0] Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) [3110] Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea [3130] Hard oligo-mesotrophic waters with benthic vegetation of Chara spp. [3140] European dry heaths [4030] Juniperus communis formations on heaths or calcareous grasslands [5130] Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210] Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) [6410] Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis) [6510] Alkaline fens [7230] **Tursiops truncatus (Common Bottlenose Dolphin) [1349]** Petalophyllum ralfsii (Petalwort) [1395] Najas flexilis (Slender Naiad) [1833]		
Cliffs of Moher SPA	42.2	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004005.pdf	**Fulmar (Fulmarus glacialis) [A009]** **Kittiwake (Rissa tridactyla) [A188]** **Guillemot (Uria aalge) [A199]** **Razorbill (Alca torda) [A200]** **Puffin (Fratercula arctica) [A204]** Chough (Pyrrhocorax pyrrhocorax) [A346]	**Fulmar** - Considered further as within foraging range of 1200.2 km; **Kittiwake** - Considered further as within foraging range of 300.6 km; **Guillemot** – Considered further as within foraging range of 153.7 km; **Razorbill** - Considered further as within foraging range of 164.6 km; and **Puffin** - Considered further as within foraging range of 265.4 km. Chough - No potential for LSE as chough is a terrestrial species with no connectivity pathway.	**Yes**
Illaunonearaun SPA	65.9	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004114.pdf	**Barnacle Goose (Branta leucopsis) [A045]**	**Barnacle Goose** - Considered further based on potential for collision on migration.	**Yes**
Inisheer Island SAC	15.9	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO001275.pdf	Coastal lagoons [1150] Reefs [1170] European dry heaths [4030] Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210] Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis) [6510] Limestone pavements [8240]	Annex I Habitats – No potential for LSE as this SAC is outside the ZoI of 15 km.	No

European site	Distance to Offshore Site for SACs and OAA for SPAs (km)	Site's conservation objectives	Qualifying Interest(s)	Justification for why the European Site has been screened in based on the ZoI for the relevant QI	Site screened in because they are considered to have potential for LSE? (Yes/ No)
Slyne Head Islands SAC	17.4	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO000328.pdf	Reefs [1170] **Tursiops truncatus (Common Bottlenose Dolphin) [1349]** **Halichoerus grypus (Grey Seal) [1364]**	**Annex I Habitats** – No potential for LSE as this SAC is outside the ZoI of 15 km; **Bottlenose dolphin** – Considered further as this SAC is within the MU for bottlenose dolphin; and **Grey seal** – Considered further as this SAC is within the range for grey seal (200 km).	**Yes**
The Twelve Bens/Garraun Complex SAC	20.82	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002031.pdf	Oligotrophic Waters containing very few minerals [3110] Oligotrophic to Mesotrophic Standing Waters [3130] Alpine and Subalpine Heaths [4060] Blanket Bogs (Active)* [7130] Rhynchosporion Vegetation [7150] Siliceous Scree [8110] Calcareous Rocky Slopes [8210] Siliceous Rocky Slopes [8220] Old Oak Woodlands [91A0] **Freshwater Pearl Mussel (Margaritifera margaritifera) [1029]** **Atlantic Salmon (Salmo salar) [1106]** Otter (Lutra lutra) [1355] Slender Naiad (Najas flexilis) [1833]	Annex I Habitats – No potential for LSE as this SAC is outside the ZoI of 15 km; **Atlantic salmon and freshwater pearl mussel** –Considered further as this SAC is within the ZoI of 50 km; and Eurasian otter – No potential for LSE as the Offshore Site does not overlap with the boundary of the SAC.	**Yes**
Inagh River Estuary SAC	21.2	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO000036.pdf	Salicornia and other annuals colonising mud and sand [1310] Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330] Mediterranean salt meadows (Juncetalia maritimi) [1410] Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120] Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]	Annex I Habitats – No potential for LSE as this SAC is outside the ZoI of 15 km.	No
Black Head-Poulsallagh Complex SAC	22.4	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO000020.pdf	Reefs [1170] Perennial vegetation of stony banks [1220] Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation [3260] Alpine and Boreal heaths [4060] Juniperus communis formations on heaths or calcareous grasslands [5130] Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210] Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis) [6510] Petrifying springs with tufa formation (Cratoneurion) [7220] Limestone pavements [8240] Submerged or partially submerged sea caves [8330] Petalophyllum ralfsii (Petalwort) [1395]	Annex I Habitats – No potential for LSE as this SAC is outside the ZoI of 15 km.	No

European site	Distance to Offshore Site for SACs and OAA for SPAs (km)	Site's conservation objectives	Qualifying Interest(s)	Justification for why the European Site has been screened in based on the ZoI for the relevant QI	Site screened in because they are considered to have potential for LSE? (Yes/ No)
West Connacht Coast SAC	22.7	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002998.pdf	**Tursiops truncatus (Common Bottlenose Dolphin) [1349]** **Phocoena phocoena (Harbour Porpoise) [1351]**	**Cetaceans** – Considered further as this SAC is within the MU for bottlenose dolphin and harbour porpoise.	**Yes**
Maumturk Mountains SAC	23.8	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002008.pdf	Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) [3110] Northern Atlantic wet heaths with Erica tetralix [4010] Alpine and Boreal heaths [4060] Blanket bogs (* if active bog) [7130] Depressions on peat substrates of the Rhynchosporion [7150] Siliceous rocky slopes with chasmophytic vegetation [8220] **Salmo salar (Salmon) [1106]** Najas flexilis (Slender Naiad) [1833]	Annex I Habitats – No potential for LSE as this SAC is outside the ZoI of 15 km; and **Atlantic salmon** – Considered further as this SAC is within the ZoI of 50 km.	**Yes**
Kingstown Bay SAC	25.5	https://www.npws.ie/protected-sites/sac/002265	Large shallow inlets and bays [1160]	Annex I Habitats – No potential for LSE as this SAC is outside the ZoI of 15 km.	No
Loop Head SPA	74.8	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004119.pdf	**Kittiwake (Rissa tridactyla) [A188]** **Guillemot (Uria aalge) [A199]**	**Kittiwake** - Considered further as within foraging range of 300.6 km; and **Guillemot** – Considered further as within foraging range of 153.7 km.	**Yes**
High Island, Inishshark and Duvillaun SPA	51.1	https://www.npws.ie/protected-sites/spa/004144	**Fulmar (Fulmarus glacialis) [A009]** **Barnacle Goose (Branta leucopsis) [A045]** **Arctic Tern (Sterna paradisaea) [A194]**	**Fulmar** – Considered further, within foraging range of 1200.2 km; **Barnacle Goose** – Considered further based on potential for collision on migration; and **Arctic tern** - Considered further as potential to pass through OAA on migration.	**Yes**
Lough Corrib SAC	35.94	https://www.npws.ie/protected-sites/sac/000297	Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) [3110] Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea [3130] Hard oligo-mesotrophic waters with benthic vegetation of Chara spp. [3140] Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation [3260] Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210] Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) [6410] Active raised bogs [7110] Degraded raised bogs still capable of natural regeneration [7120] Depressions on peat substrates of the Rhynchosporion [7150] Calcareous fens with Cladium mariscus and species of the Caricion davallianae [7210] Petrifying springs with tufa formation (Cratoneurion) [7220] Alkaline fens [7230]	Annex I Habitats – No potential for LSE as this SAC is outside the ZoI of 15 km; **Atlantic salmon, sea lamprey and freshwater pearl mussel** – Considered further as this SAC is within the ZoI of 50 km; and Eurasian otter – No potential for LSE as the Offshore Site does not overlap with the boundary of the SAC.	**Yes**

European site	Distance to Offshore Site for SACs and OAA for SPAs (km)	Site's conservation objectives	Qualifying Interest(s)	Justification for why the European Site has been screened in based on the ZoI for the relevant QI	Site screened in because they are considered to have potential for LSE? (Yes/ No)
			Limestone pavements [8240] Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0] Bog woodland [91D0] **Margaritifera margaritifera (Freshwater Pearl Mussel) [1029]** Austropotamobius pallipes (White-clawed Crayfish) [1092] **Petromyzon marinus (Sea Lamprey) [1095]** Lampetra planeri (Brook Lamprey) [1096] **Salmo salar (Salmon) [1106]** Rhinolophus hipposideros (Lesser Horseshoe Bat) [1303] Lutra lutra (Otter) [1355] Najas flexilis (Slender Naiad) [1833] Hamatocaulis vernicosus (Slender Green Feather-moss) [6216]"		
Mweelrea/Sheeffry/Erriff Complex SAC	36.54	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO001932.pdf	Coastal lagoons [1150] Annual vegetation of drift lines [1210] Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330] Mediterranean salt meadows (Juncetalia maritimi) [1410] Embryonic shifting dunes [2110] Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120] Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] Atlantic decalcified fixed dunes (Calluno-Ulicetea) [2150] Dunes with Salix repens ssp. argentea (Salicion arenariae) [2170] Humid dune slacks [2190] Machairs (* in Ireland) [21A0] Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) [3110] Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea [3130] Natural dystrophic lakes and ponds [3160] Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation [3260] Northern Atlantic wet heaths with Erica tetralix [4010] European dry heaths [4030] Alpine and Boreal heaths [4060] Juniperus communis formations on heaths or calcareous grasslands [5130] Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels [6430] Blanket bogs (* if active bog) [7130] Transition mires and quaking bogs [7140] Depressions on peat substrates of the Rhynchosporion [7150] Petrifying springs with tufa formation (Cratoneurion) [7220] Alkaline fens [7230] Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani) [8110] Calcareous rocky slopes with chasmophytic vegetation [8210]	Annex I Habitats – No potential for LSE as this SAC is outside the ZoI of 15 km; **Atlantic salmon and freshwater pearl mussel** – Considered further as this SAC is within the ZoI of 50 km; and Eurasian otter – No potential for LSE as the Offshore Site does not overlap with the boundary of the SAC.	**Yes**

European site	Distance to Offshore Site for SACs and OAA for SPAs (km)	Site's conservation objectives	Qualifying Interest(s)	Justification for why the European Site has been screened in based on the ZoI for the relevant QI	Site screened in because they are considered to have potential for LSE? (Yes/ No)
			Siliceous rocky slopes with chasmophytic vegetation [8220] Vertigo geyeri (Geyer's Whorl Snail) [1013] Vertigo angustior (Narrow-mouthed Whorl Snail) [1014] **Margaritifera margaritifera (Freshwater Pearl Mussel) [1029]** **Salmo salar (Salmon) [1106]** Lutra lutra (Otter) [1355] Petalophyllum ralfsii (Petalwort) [1395] Najas flexilis (Slender Naiad) [1833]		
Inishbofin and Inishshark SAC	38.2	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO000278.pdf	Coastal lagoons [1150] Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) [3110] Northern Atlantic wet heaths with Erica tetralix [4010] European dry heaths [4030] **Halichoerus grypus (Grey Seal) [1364]**	Annex I Habitats – No potential for LSE as this SAC is outside the ZoI of 15 km; **Grey seal** - Considered further as this SAC is within the range for grey seal (200 km).	**Yes**
Inner Galway Bay SPA	56.5	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004031.pdf	Black-throated Diver (Gavia arctica) [A002] **Great Northern Diver (Gavia immer) [A003]** Cormorant (Phalacrocorax carbo) [A017] Grey Heron (Ardea cinerea) [A028] **Light-bellied Brent Goose (Branta bernicla hrota) [A046]** **Wigeon (Anas penelope) [A050]** **Teal (Anas crecca) [A052]** **Red-breasted Merganser (Mergus serrator) [A069]** **Ringed Plover (Charadrius hiaticula) [A137]** **Golden Plover (Pluvialis apricaria) [A140]** **Lapwing (Vanellus vanellus) [A142]** **Dunlin (Calidris alpina) [A149]** **Bar-tailed Godwit (Limosa lapponica) [A157]** **Curlew (Numenius arquata) [A160]** **Redshank (Tringa totanus) [A162]** **Turnstone (Arenaria interpres) [A169]** Black-headed Gull (Chroicocephalus ridibundus) [A179] **Common Gull (Larus canus) [A182]** **Sandwich Tern (Sterna sandvicensis) [A191]** **Common Tern (Sterna hirundo) [A193]** **Wetland and Waterbirds [A999]**	Black-throated Diver - No potential for LSE as not recorded in OAA on baseline surveys; **Great Northern Diver** - Considered further based on distance to OAA; Cormorant - No potential for LSE as outside 33.9 km; Black headed gull - No potential for LSE as not recorded on baseline surveys; **Common gull** - Considered further as based on distance to OAA; **Sandwich tern** –Considered further as potential to pass through OAA on migration; **Common tern** - Considered further as potential to pass through OAA on migration; and **Wildfowl and waders** are considered further based on potential for collision on migration. **Wetland and Waterbirds** – Considered further based on potential for surface water pollution	**Yes**
Galway Bay Complex SAC	43.2	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO000268.pdf	Mudflats and sandflats not covered by seawater at low tide [1140] Coastal lagoons [1150] Large shallow inlets and bays [1160] Reefs [1170] Perennial vegetation of stony banks [1220] Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] Salicornia and other annuals colonising mud and sand [1310] Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330]	Annex I Habitats – No potential for LSE as this SAC is outside the ZoI of 15 km; **Harbour seal** – Considered further as this SAC is within the range for harbour seal (75 km); and Eurasian otter – No potential for LSE as the Offshore Site does not overlap with the boundary of the SAC.	**Yes**

European site	Distance to Offshore Site for SACs and OAA for SPAs (km)	Site's conservation objectives	Qualifying Interest(s)	Justification for why the European Site has been screened in based on the ZoI for the relevant QI	Site screened in because they are considered to have potential for LSE? (Yes/ No)
			Mediterranean salt meadows (Juncetalia maritimi) [1410] Turloughs [3180] Juniperus communis formations on heaths or calcareous grasslands [5130] Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210] Calcareous fens with Cladium mariscus and species of the Caricion davallianae [7210] Alkaline fens [7230] Limestone pavements [8240] Lutra lutra (Otter) [1355] **Phoca vitulina (Harbour Seal) [1365]**		
Akeragh, Banna and Barrow Harbour SAC	44	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO000332.pdf	Annual vegetation of drift lines [1210] Salicornia and other annuals colonising mud and sand [1310] Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330] Mediterranean salt meadows (Juncetalia maritimi) [1410] Embryonic shifting dunes [2110] Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120] Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] Humid dune slacks [2190] European dry heaths [4030]	Annex I Habitats – No potential for LSE as this SAC is outside the ZoI of 15 km.	No
Lough Cahasy, Lough Baun And Roonah Lough SAC	47	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO001529.pdf	Coastal lagoons [1150] Perennial vegetation of stony banks [1220] Embryonic shifting dunes [2110] Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120] Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] Machairs (* in Ireland) [21A0]	Annex I Habitats – No potential for LSE as this SAC is outside the ZoI of 15 km.	No
Magharee Islands SAC	50	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002261.pdf	Reefs [1170]	Annex I Habitats – No potential for LSE as this SAC is outside the ZoI of 15 km.	No
Illaunnanoon SPA	50.5	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004221.pdf	**Sandwich Tern (Sterna sandvicensis) [A191]**	**Sandwich tern –** Considered further as potential to pass through OAA on migration.	**Yes**
Magharee Islands SPA	103.3	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004125.pdf	**Storm Petrel (Hydrobates pelagicus) [A014]** Shag (Phalacrocorax aristotelis) [A018] **Barnacle Goose (Branta leucopsis) [A045]** Common Gull (Larus canus) [A182] **Common Tern (Sterna hirundo) [A193]** **Arctic Tern (Sterna paradisaea) [A194]** **Little Tern (Sterna albifrons) [A195]**	**Storm Petrel** - Considered further as within foraging range of 336 km; Shag - No potential for LSE as outside 23.7 km; **Barnacle Goose** - Considered further based on potential for collision on migration; Common gull - No potential for LSE as outside 50 km; **Common tern** - Considered further as potential to pass through OAA on migration;	**Yes**

European site	Distance to Offshore Site for SACs and OAA for SPAs (km)	Site's conservation objectives	Qualifying Interest(s)	Justification for why the European Site has been screened in based on the ZoI for the relevant QI	Site screened in because they are considered to have potential for LSE? (Yes/ No)
				Arctic tern - Considered further as potential to pass through OAA on migration; and **Little tern** - Considered further as potential to pass through OAA on migration.	
Clare Island SPA	70.7	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004136.pdf	**Fulmar (Fulmarus glacialis) [A009]** Shag (Phalacrocorax aristotelis) [A018] Common Gull (Larus canus) [A182] **Kittiwake (Rissa tridactyla) [A188]** **Guillemot (Uria aalge) [A199]** **Razorbill (Alca torda) [A200]** Chough (Pyrrhocorax pyrrhocorax) [A346]	**Fulmar** - Considered further as within foraging range of 1200.2 km; Shag - No potential for LSE as outside 23.7 km; Common gull - No potential for LSE as outside 50 km; **Kittiwake** - Considered further as within foraging range of 300.6 km; **Guillemot** - Considered further as within foraging range of 153.7 km; and **Razorbill** - Considered further as within foraging range of 164.6 km. Chough - No potential for LSE as chough is a terrestrial species with no connectivity pathway.	Yes
Bills Rocks SPA	76.0	https://www.npws.ie/protected-sites/spa/004177	**Storm Petrel (Hydrobates pelagicus) [A014]** **Puffin (Fratercula arctica) [A204]**	**Storm Petrel** - Considered further as within foraging range of 336 km; and **Puffin** - Considered further as within foraging range of 265.4 km.	Yes
Dingle Peninsula SPA	119.3	https://www.npws.ie/protected-sites/spa/004153	**Fulmar (Fulmarus glacialis) [A009]** Peregrine (Falco peregrinus) [A103] Chough (Pyrrhocorax pyrrhocorax) [A346]	**Fulmar** - Considered further as within foraging range of 1200.2 km; and Peregrine and chough - No potential for LSE as these are terrestrial species with no connectivity pathway.	Yes
Blasket Islands SAC	90.1	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002172.pdf	Reefs [1170] Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] European dry heaths [4030] Submerged or partially submerged sea caves [8330] **Phocoena phocoena (Harbour Porpoise) [1351]** **Halichoerus grypus (Grey Seal) [1364]**	Annex I Habitats – No potential for LSE as this SAC is greater than 15 km from the Offshore Site; **Harbour porpoise** – Considered further as this SAC is within the MU for harbour porpoise; and **Grey seal** - Considered further as this SAC is within the range for grey seal (200 km).	Yes
Duvillaun Islands SAC	91.5	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO000495.pdf	**Tursiops truncatus (Common Bottlenose Dolphin) [1349]** **Halichoerus grypus (Grey Seal) [1364]**	**Bottlenose dolphin** – Considered further as this SAC is within the MU for bottlenose dolphin; and **Grey seal** – Considered further as this SAC is within the range for grey seal (200 km).	Yes
Duvillaun Islands SPA	104.5	https://www.npws.ie/protected-sites/spa/004111	**Fulmar (Fulmarus glacialis) [A009]** **Storm Petrel (Hydrobates pelagicus) [A014]** **Barnacle Goose (Branta leucopsis) [A045]**	**Fulmar** - Considered further as within foraging range of 1200.2 km;	Yes

European site	Distance to Offshore Site for SACs and OAA for SPAs (km)	Site's conservation objectives	Qualifying Interest(s)	Justification for why the European Site has been screened in based on the ZoI for the relevant QI	Site screened in because they are considered to have potential for LSE? (Yes/ No)
				Storm Petrel - Considered further as within foraging range of 336 km; and **Barnacle goose** - Considered further based on potential for collision on migration.	
Blasket Islands SPA	139.0	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004008.pdf	**Fulmar (Fulmarus glacialis) [A009]** **Manx Shearwater (Puffinus puffinus) [A013]** **Storm Petrel (Hydrobates pelagicus) [A014]** Shag (Phalacrocorax aristotelis) [A018] **Lesser Black-backed Gull (Larus fuscus) [A183]** Herring Gull (Larus argentatus) [A184] **Kittiwake (Rissa tridactyla) [A188]** Arctic Tern (Sterna paradisaea) [A194] **Razorbill (Alca torda) [A200]** **Puffin (Fratercula arctica) [A204]** Chough (Pyrrhocorax pyrrhocorax) [A346]	**Fulmar** - Considered further as within foraging range of 1200.2 km; **Manx Shearwater** – Considered further as within foraging range of 2,365.5 km; **Storm Petrel** - Considered further as within foraging range of 336 km; Shag - No potential for LSE as outside 23.7 km; **Lesser black backed gull** - Considered further as within foraging range of 236 km; Herring gull - No potential for LSE as outside 85.6 km; **Kittiwake** - Considered further as within foraging range of 300.6 km; Arctic tern - No potential for LSE as outside 40.5 km; **Razorbill** - Considered further as within foraging range of 164.65 km; and **Puffin** - Considered further as within foraging range of 265.4 km. Chough - No potential for LSE as chough is a terrestrial species with no connectivity pathway.	Yes
Inishglora and Inishkeeragh SPA	117.0	https://www.npws.ie/protected-sites/spa/004084	**Storm Petrel (Hydrobates pelagicus) [A014]** Cormorant (Phalacrocorax carbo) [A017] Shag (Phalacrocorax aristotelis) [A018] **Barnacle Goose (Branta leucopsis) [A045]** **Lesser Black-backed Gull (Larus fuscus) [A183]** Herring Gull (Larus argentatus) [A184] **Arctic Tern (Sterna paradisaea) [A194]**	**Storm Petrel** - Considered further as within foraging range of 336 km; Cormorant - No potential for LSE as outside 33.9 km; Shag - No potential for LSE as outside 23.7 km; **Barnacle Goose** - Considered further based on potential for collision on migration; **Lesser black backed gull** - Considered further as within foraging range of 236 km; Herring gull - No potential for LSE as outside 85.6 km; and **Arctic tern** - Considered further as potential to pass through OAA on migration.	Yes
Iveragh Peninsula SPA	171.1	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004154.pdf	**Fulmar (Fulmarus glacialis) [A009]** Peregrine (Falco peregrinus) [A103] **Kittiwake (Rissa tridactyla) [A188]**	**Fulmar** - Considered further as within foraging range of 1200.2 km; **Kittiwake** - Considered further as within foraging range of 300.6 km; and	Yes

European site	Distance to Offshore Site for SACs and OAA for SPAs (km)	Site's conservation objectives	Qualifying Interest(s)	Justification for why the European Site has been screened in based on the ZoI for the relevant QI	Site screened in because they are considered to have potential for LSE? (Yes/ No)
			Guillemot (Uria aalge) [A199] Chough (Pyrrhocorax pyrrhocorax) [A346]	Guillemot - No potential for LSE as outside 153.7 km; and Peregrine and chough - No potential for LSE as these are terrestrial species with no connectivity pathway.	
Puffin Island SPA	167.5	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004003.pdf	**Fulmar (Fulmarus glacialis) [A009]** **Manx Shearwater (Puffinus puffinus) [A013]** **Storm Petrel (Hydrobates pelagicus) [A014]** **Lesser Black-backed Gull (Larus fuscus) [A183]** Razorbill (Alca torda) [A200] **Puffin (Fratercula arctica) [A204]**	**Fulmar** - Considered further as within foraging range of 1200.2 km; **Manx Shearwater** - Considered further as within foraging range of 2,365.5 km; **Storm Petrel** - Considered further as within foraging range of 336 km; **Lesser black backed gull** - Considered further as within foraging range of 236 km; **Razorbill** – No potential for LSE as outside 164.6 km; and **Puffin** - Considered further as within foraging range of 265.4 km.	**Yes**
Skelligs SPA	176.4	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004007.pdf	**Fulmar (Fulmarus glacialis) [A009]** **Manx Shearwater (Puffinus puffinus) [A013]** **Storm Petrel (Hydrobates pelagicus) [A014]** **Gannet (Morus bassanus) [A016]** **Kittiwake (Rissa tridactyla) [A188]** Guillemot (Uria aalge) [A199] **Puffin (Fratercula arctica) [A204]**	**Fulmar** - Considered further as within foraging range of 1200.2 km; **Manx Shearwater** - Considered further as within foraging range of 2,365.5 km; **Storm Petrel** - Considered further as within foraging range of 336 km; **Gannet** - Considered further as within foraging range of 509.4 km; **Kittiwake** - Considered further as within foraging range of 300.6 km; Guillemot – No potential for LSE as outside 153.7 km; and **Puffin** - Considered further as within foraging range of 265.4 km.	**Yes**
Stags of Broad Haven SPA	143.1	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004072.pdf	**Storm Petrel (Hydrobates pelagicus) [A014]** Leach's Petrel (Hydrobates leucorhoa) [A015]	**Storm Petrel** - Considered further as within foraging range of 336 km; and Leach's Petrel – No potential for LSE as not recorded on baseline surveys.	**Yes**
Kenmare River SAC	139.3	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002158.pdf	Large shallow inlets and bays [1160] Reefs [1170] Perennial vegetation of stony banks [1220] Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330] Mediterranean salt meadows (Juncetalia maritimi) [1410] Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120] Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] European dry heaths [4030]	Annex I Habitats – No potential for LSE as outside 15 km; **Harbour porpoise** – Considered further as this SAC is within the MU for harbour porpoise; Harbour seal – No potential for LSE as outside range for harbour seal (75 km); and Eurasian otter – No potential for LSE as the Offshore Site does not overlap with the boundary of the SAC.	**Yes**

European site	Distance to Offshore Site for SACs and OAA for SPAs (km)	Site's conservation objectives	Qualifying Interest(s)	Justification for why the European Site has been screened in based on the ZoI for the relevant QI	Site screened in because they are considered to have potential for LSE? (Yes/ No)
			› Juniperus communis formations on heaths or calcareous grasslands [5130] › Calaminarian grasslands of the Violetalia calaminariae [6130] › Submerged or partially submerged sea caves [8330] › Vertigo angustior (Narrow-mouthed Whorl Snail) [1014] › Rhinolophus hipposideros (Lesser Horseshoe Bat) [1303] › **Phocoena phocoena (Harbour Porpoise) [1351]** › Lutra lutra (Otter) [1355] › Phoca vitulina (Harbour Seal) [1365]		
Eirk Bog SPA	145	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004108.pdf	› Greenland White-fronted Goose (Anser albifrons flavirostris) [A395]	› **Greenland White-fronted Goose** – Considered further based on potential for collision on migration.	**Yes**
The Gearagh SPA	165	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004109.pdf	› **Wigeon (Anas penelope) [A050]** › **Teal (Anas crecca) [A052]** › **Mallard (Anas platyrhynchos) [A053]** › **Coot (Fulica atra) [A125]** › **Wetland and Waterbirds [A999]**	› **Wigeon** - Considered further based on potential for collision on migration. › **Teal** - Considered further based on potential for collision on migration. › **Mallard** - Considered further based on potential for collision on migration. › **Coot** - Considered further based on potential for collision on migration. › **Wetland and Waterbirds** – Considered further based on potential for surface water pollution.	**Yes**
Clonakilty Bay SPA	195	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004081.pdf	› **Shelduck (Tadorna tadorna) [A048]** › **Dunlin (Calidris alpina) [A149]** › **Black-tailed Godwit (Limosa limosa) [A156]** › **Curlew (Numenius arquata) [A160]** › **Wetland and Waterbirds [A999]**	› **Shelduck** - Considered further based on potential for collision on migration. › **Dunlin** - Considered further based on potential for collision on migration. › **Black-tailed Godwit** - Considered further based on potential for collision on migration. › **Curlew** - Considered further based on potential for collision on migration. › **Wetland and Waterbirds** – Considered further based on potential for surface water pollution	**Yes**
Deenish Island and Scariff Island SPA	190.1	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004175.pdf	› **Fulmar (Fulmarus glacialis) [A009]** › **Manx Shearwater (Puffinus puffinus) [A013]** › **Storm Petrel (Hydrobates pelagicus) [A014]** › **Lesser Black-backed Gull (Larus fuscus) [A183]** › Arctic Tern (Sterna paradisaea) [A194]	› **Fulmar** - Considered further as within foraging range of 1200.2 km; › **Manx Shearwater** - Considered further as within foraging range of 2,365.5 km; › **Storm Petrel** - Considered further as within foraging range of 336 km; › **Lesser black backed gull** - Considered further as within foraging range of 236 km; and › Arctic tern - No potential for LSE as outside 40 km.	**Yes**

European site	Distance to Offshore Site for SACs and OAA for SPAs (km)	Site's conservation objectives	Qualifying Interest(s)	Justification for why the European Site has been screened in based on the ZoI for the relevant QI	Site screened in because they are considered to have potential for LSE? (Yes/ No)
Illanmaster SPA	226.2	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004074.pdf	**Storm Petrel (Hydrobates pelagicus) [A014]**	**Storm Petrel** - Considered further as within foraging range of 336 km.	Yes
The Bull and The Cow Rocks SPA	192.4	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004066.pdf	**Storm Petrel (Hydrobates pelagicus) [A014]** **Gannet (Morus bassanus) [A016]** **Puffin (Fratercula arctica) [A204]**	**Storm Petrel** - Considered further as within foraging range of 336 km; **Gannet** - Considered further as within foraging range of 509.4 km; and **Puffin** - Considered further as within foraging range of 265.4 km.	Yes
Beara Peninsula SPA	206.1	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004155.pdf	**Fulmar (Fulmarus glacialis) [A009]** Chough (Pyrrhocorax pyrrhocorax) [A346]	**Fulmar** - Considered further as within foraging range of 1200.2 km. Chough - No potential for LSE as chough is a terrestrial species with no connectivity pathway.	Yes
Hook Head SAC	189.1	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO000764.pdf	Large shallow inlets and bays [1160] Reefs [1170] Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] Tursiops truncatus (Common Bottlenose Dolphin) [1349] **Phocoena phocoena (Harbour Porpoise) [1351]**	Annex I Habitats – No potential for LSE as outside 15 km; and **Harbour porpoise** – Considered further as this SAC is within the MU for harbour porpoise; and Bottlenose dolphin - no potential for LSE as this site lies outside of the MUs for bottlenose dolphin.	Yes
Belgica Mound Province SAC	197.9	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002327.pdf	Reefs [1170] Tursiops truncatus (Common Bottlenose Dolphin) [1349] **Phocoena phocoena (Harbour Porpoise) [1351]**	Annex I Habitats – No potential for LSE as outside 15 km; and **Harbour porpoise** – Considered further as this SAC is within the MU for harbour porpoise; and Bottlenose dolphin – No potential for LSE as this SAC lies outside the MUs for bottlenose dolphin.	Yes
Roaringwater Bay and Islands SAC	198.3	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO000101.pdf	Large shallow inlets and bays [1160] Reefs [1170] Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] European dry heaths [4030] Submerged or partially submerged sea caves [8330] **Phocoena phocoena (Harbour Porpoise) [1351]** Lutra lutra (Otter) [1355] **Halichoerus grypus (Grey Seal) [1364]**	Annex I Habitats – No potential for LSE as this SAC is greater than 15 km from the Offshore Site; **Harbour porpoise** – Considered further as this SAC is within the MU for harbour porpoise; **Grey seal** - Considered further as this SAC is within the range for grey seal (200 km); and Eurasian otter – No potential for LSE as the Offshore Site does not overlap with the boundary of the SAC.	Yes
Aughris Head SPA	225.7	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004133.pdf	**Kittiwake (Rissa tridactyla) [A188]**	**Kittiwake** - Considered further as within foraging range of 300.6 km.	Yes

European site	Distance to Offshore Site for SACs and OAA for SPAs (km)	Site's conservation objectives	Qualifying Interest(s)	Justification for why the European Site has been screened in based on the ZoI for the relevant QI	Site screened in because they are considered to have potential for LSE? (Yes/ No)
West Donegal Coast SPA	247.7	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004150.pdf	**Fulmar (Fulmarus glacialis) [A009]** Cormorant (Phalacrocorax carbo) [A017] Shag (Phalacrocorax aristotelis) [A018] Peregrine (Falco peregrinus) [A103] Herring Gull (Larus argentatus) [A184] **Kittiwake (Rissa tridactyla) [A188]** Razorbill (Alca torda) [A200] Chough (Pyrrhocorax pyrrhocorax) [A346]	**Fulmar** - Considered further as within foraging range of 1200.2 km; Cormorant - No potential for LSE as outside 33.9 km; Shag - No potential for LSE as outside 23.7 km; Herring gull - No potential for LSE as outside 85.66 km; **Kittiwake** - Considered further as within foraging range of 300.6 km; and Razorbill - No potential for LSE as outside 165.6 km; and Peregrine and chough - No potential for LSE as these are terrestrial species with no connectivity pathway.	**Yes**
Gweedore Bay and Islands SAC	214.5	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO001141.pdf	Coastal lagoons [1150] Reefs [1170] Perennial vegetation of stony banks [1220] Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330] Mediterranean salt meadows (Juncetalia maritimi) [1410] Embryonic shifting dunes [2110] Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120] Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] Decalcified fixed dunes with Empetrum nigrum [2140] Atlantic decalcified fixed dunes (Calluno-Ulicetea) [2150] Dunes with Salix repens ssp. argentea (Salicion arenariae) [2170] Humid dune slacks [2190] Machairs (* in Ireland) [21A0] Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea [3130] European dry heaths [4030] Alpine and Boreal heaths [4060] Juniperus communis formations on heaths or calcareous grasslands [5130] Euphydryas aurinia (Marsh Fritillary) [1065] **Phocoena phocoena (Harbour Porpoise) [1351]** Lutra lutra (Otter) [1355] Petalophyllum ralfsii (Petalwort) [1395] Najas flexilis (Slender Naiad) [1833]	Annex I Habitats – No potential for LSE as outside 15 km; **Harbour porpoise** – Considered further as this SAC is within the MU for harbour porpoise; and Eurasian otter – No potential for LSE as the Offshore Site does not overlap with the boundary of the SAC.	**Yes**
Bunduff Lough and Machair/Trawalua/ Mullaghmore SAC	218.1	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO000625.pdf	Mudflats and sandflats not covered by seawater at low tide [1140] Large shallow inlets and bays [1160] Reefs [1170]	Annex I Habitats – No potential for LSE as outside 15 km; and **Harbour porpoise** – Considered further as this SAC is within the MU for harbour porpoise.	**Yes**

European site	Distance to Offshore Site for SACs and OAA for SPAs (km)	Site's conservation objectives	Qualifying Interest(s)	Justification for why the European Site has been screened in based on the ZoI for the relevant QI	Site screened in because they are considered to have potential for LSE? (Yes/ No)
			Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120] Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] Humid dune slacks [2190] Machairs (* in Ireland) [21A0] Juniperus communis formations on heaths or calcareous grasslands [5130] Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210] Alkaline fens [7230] Euphydryas aurinia (Marsh Fritillary) [1065] **Phocoena phocoena (Harbour Porpoise) [1351]** Petalophyllum ralfsii (Petalwort) [1395]		
St John's Point SAC	219.2	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO000191.pdf	Large shallow inlets and bays [1160] Reefs [1170] Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210] Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) [6410] Alkaline fens [7230] Limestone pavements [8240] Submerged or partially submerged sea caves [8330] Euphydryas aurinia (Marsh Fritillary) [1065] **Tursiops truncatus (Common Bottlenose Dolphin) [1349]**	Annex I Habitats – No potential for LSE as outside 15 km; and **Bottlenose dolphin** – Considered further as this SAC is within the MU for bottlenose dolphin.	**Yes**
Carnsore Point SAC	220.9	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002269.pdf	Mudflats and sandflats not covered by seawater at low tide [1140] Reefs [1170] **Phocoena phocoena (Harbour Porpoise) [1351]**	Annex I Habitats – No potential for LSE as outside 15 km; and **Harbour porpoise** – Considered further as this SAC is within the MU for harbour porpoise.	**Yes**
Blackwater Bank SAC	227.9	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002953.pdf	Sandbanks which are slightly covered by sea water all the time [1110] **Phocoena phocoena (Harbour Porpoise) [1351]**	Annex I Habitats – No potential for LSE as outside 15 km; and **Harbour porpoise** – Considered further as this SAC is within the MU for harbour porpoise.	**Yes**
Lough Swilly SAC	235.7	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002287.pdf	Estuaries [1130] Coastal lagoons [1150] Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330] Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) [6410] Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0] **Phocoena phocoena (Harbour Porpoise) [1351]** Lutra lutra (Otter) [1355]	Annex I Habitats – No potential for LSE as outside 15 km; **Harbour porpoise** – Considered further as this SAC is within the MU for harbour porpoise; and Eurasian otter – No potential for LSE as the Offshore Site does not overlap with the boundary of the SAC.	**Yes**

European site	Distance to Offshore Site for SACs and OAA for SPAs (km)	Site's conservation objectives	Qualifying Interest(s)	Justification for why the European Site has been screened in based on the ZoI for the relevant QI	Site screened in because they are considered to have potential for LSE? (Yes/ No)
Codling Fault Zone SAC	267.5	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO003015.pdf	- Submarine structures made by leaking gases [1180] - **Phocoena phocoena (Harbour Porpoise) [1351]**	- Annex I Habitats – No potential for LSE as outside 15 km; and - **Harbour porpoise** – Considered further as this SAC is within the MU for harbour porpoise.	**Yes**
Tory Island SPA	290.4	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004073.pdf	- **Fulmar (Fulmarus glacialis) [A009]** - Corncrake (Crex crex) [A122] - Razorbill (Alca torda) [A200] - Puffin (Fratercula arctica) [A204]	- **Fulmar** - Considered further as within foraging range of 1200.2 km; - Razorbill – No potential for LSE as outside 164.6 km; and - Puffin – No potential for LSE as outside 265.4 km	**Yes**
Old Head of Kinsale SPA	392.5	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004021.pdf	- Kittiwake (Rissa tridactyla) [A188] - Guillemot (Uria aalge) [A199]	- Kittiwake - No potential for LSE as outside 300.6 km; and - Guillemot - No potential for LSE as outside 153.7 km.	**No**
Horn Head to Fanad Head SPA	305.6	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004194.pdf	- **Fulmar (Fulmarus glacialis) [A009]** - Cormorant (Phalacrocorax carbo) [A017] - Shag (Phalacrocorax aristotelis) [A018] - **Barnacle Goose (Branta leucopsis) [A045]** - Peregrine (Falco peregrinus) [A103] - Kittiwake (Rissa tridactyla) [A188] - Guillemot (Uria aalge) [A199] - Razorbill (Alca torda) [A200] - Chough (Pyrrhocorax pyrrhocorax) [A346] - Greenland White-fronted Goose (Anser albifrons flavirostris) [A395]	- **Fulmar** - Considered further as within foraging range of 1200.2 km; - Cormorant - No potential for LSE as outside 33.9 km; - Shag - No potential for LSE as outside 23.7 km; - **Barnacle Goose** - Considered further based on potential for collision on migration; - Kittiwake – No potential for LSE as outside 300.6 km; - Guillemot - No potential for LSE as outside 153.7 km; - Razorbill - No potential for LSE as outside 164.6 km; - **Greenland White-fronted Goose** - Considered further based on potential for collision on migration; and - Peregrine and chough - No potential for LSE as these are terrestrial species with no connectivity pathway.	**Yes**
Saltee Islands SPA	491.9	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004002.pdf	- **Fulmar (Fulmarus glacialis) [A009]** - **Gannet (Morus bassanus) [A016]** - Cormorant (Phalacrocorax carbo) [A017] - Shag (Phalacrocorax aristotelis) [A018] - Lesser Black-backed Gull (Larus fuscus) [A183] - Herring Gull (Larus argentatus) [A184] - Kittiwake (Rissa tridactyla) [A188] - Guillemot (Uria aalge) [A199] - Razorbill (Alca torda) [A200]	- **Fulmar** - Considered further as within foraging range of 1200.2 km; - **Gannet** - Considered further as within foraging range of 509.4 km; - Cormorant - No potential for LSE as outside 33.9 km; - Shag - No potential for LSE as outside 23.7 km; - Lesser black backed gull - No potential for LSE as outside 236 km;	**Yes**

European site	Distance to Offshore Site for SACs and OAA for SPAs (km)	Site's conservation objectives	Qualifying Interest(s)	Justification for why the European Site has been screened in based on the ZoI for the relevant QI	Site screened in because they are considered to have potential for LSE? (Yes/ No)
			Puffin (Fratercula arctica) [A204]	Herring gull - No potential for LSE as outside 85.6 km; Kittiwake - No potential for LSE as outside 300.6 km; Guillemot - No potential for LSE as outside 153.7 km; Razorbill - No potential for LSE as outside 164.6 km; and Puffin - No potential for LSE as outside 265.4 km.	
Mingulay and Berneray SPA	421.4	https://www.nature.scot/sites/default/files/special-protection-area/8545/conservation-objectives.pdf	**Fulmar (Fulmarus glacialis)** Kittiwake (Rissa tridactyla) Guillemot (Uria aalge) Puffin (Fratercula arctica)	**Fulmar** - Considered further as within foraging range of 1200.2 km; Kittiwake - No potential for LSE as outside 300.6 km; Guillemot - No potential for LSE as outside 153.7 km; and Puffin - No potential for LSE as outside 265.4 km.	**Yes**
Skomer, Skokholm and the Seas off Pembrokeshire / Sgomer, Sgogwm a Moroedd Penfro SPA	543.1	https://naturalresources.wales/media/675733/skomer-skokholm-and-seas-off-pembs-pspa-draft-conservation-objectives-final.pdf	Storm Petrel (Hydrobates pelagicus) Chough (Pyrrhocorax pyrrhocorax) Short-eared owl (Asio flammeus) **Manx Shearwater (Puffinus puffinus)** Puffin (Fratercula arctica) Lesser Black-backed Gull (Larus fuscus) Seabird assemblage	Storm Petrel – No potential for LSE as outside foraging range of 336 km; **Manx Shearwater** - Considered further as within foraging range of 2,365.5 km; Puffin - No potential for LSE as outside 265.4 km; Lesser black backed gull - No potential for LSE as outside 236 km; and Chough and short-eared owl - No potential for LSE as these are terrestrial species with no connectivity pathway.	**Yes**
North Channel SAC	450.8	https://data.jncc.gov.uk/data/be0492aa-f1d6-4197-be22-e9a695227bdb/NorthChannel-conservation-advice.pdf	**Phocoena phocoena (Harbour Porpoise)**	**Harbour porpoise** – Considered further as this SAC is within the MU for harbour porpoise.	**Yes**
Ailsa Craig SPA	517.5	https://www.nature.scot/sites/default/files/special-protection-area/8463/conservation-objectives.pdf	Herring Gull (Larus argentatus) Gannet (Morus bassanus) Kittiwake (Rissa tridactyla) Guillemot (Uria aalge)	Herring gull - No potential for LSE as outside 85.6 km; Gannet - No potential for LSE as outside 504.9 km; Kittiwake - No potential for LSE as outside 300.6 km; and Guillemot - No potential for LSE as outside 153.7 km.	No
West Wales Marine / Gorllewin Cymru Forol SAC	472.9	https://data.jncc.gov.uk/data/029e40f3-5f67-4168-b10d-8730f2c40e0a/WWM-conservation-advice.pdf	**Phocoena phocoena (Harbour Porpoise)**	**Harbour porpoise** – Considered further as this SAC is within the MU for harbour porpoise.	**Yes**

European site	Distance to Offshore Site for SACs and OAA for SPAs (km)	Site's conservation objectives	Qualifying Interest(s)	Justification for why the European Site has been screened in based on the ZoI for the relevant QI	Site screened in because they are considered to have potential for LSE? (Yes/ No)
Rum SPA	511	https://www.nature.scot/sites/default/files/special-protection-area/8574/draft-conservation-objectives.pdf	Golden eagle (Aquila chrysaetos) **Manx Shearwater (Puffinus puffinus)** Kittiwake (Rissa tridactyla) Guillemot (Uria aalge)	**Manx Shearwater** - Considered further as within foraging range of 2,365.5 km; Kittiwake - No potential for LSE as outside 300.6 km; Guillemot - No potential for LSE as outside 153.7 km; and Golden eagle - No potential for LSE as golden eagle is a terrestrial species with no connectivity pathway.	**Yes**
Seas off St Kilda SPA	577.2	https://data.jncc.gov.uk/data/da761bd3-6968-429c-87a6-835a966c34fc/seas-off-st-kilda-sas-conservation-objectives-reg-18.pdf	Puffin (Fratercula arctica) **Fulmar (Fulmarus glacialis)** Storm Petrel (Hydrobates pelagicus) Gannet (Morus bassanus) Guillemot (Uria aalge)	Guillemot - No potential for LSE as outside 153.7 km; Gannet - No potential for LSE as outside 504.9 km; Storm Petrel – No potential for LSE as outside foraging range of 336 km; **Fulmar** - Considered further as within foraging range of 1200.2 km; and Guillemot - No potential for LSE as outwith 153.7 km.	**Yes**
Grassholm SPA	602.2	https://jncc.gov.uk/jncc-assets/SPA-N2K/UK9014041.pdf	Gannet (Morus bassanus)	**Gannet** - No potential for LSE as outside 509.4 km.	**No**
Bristol Channel Approaches / Dynesfeydd Môr Hafren SAC	497.0	https://data.jncc.gov.uk/data/505b3bab-a974-41e5-991c-c29ef3e01c0a/BCA-ConsAdvice.pdf	**Phocoena phocoena (Harbour Porpoise)**	**Harbour porpoise** – Considered further as this SAC is within the MU for harbour porpoise.	**Yes**
St Kilda SPA	551.7	https://www.nature.scot/sites/default/files/special-protection-area/8580/draft-conservation-objectives.pdf	Razorbill (Alca torda) Puffin (Fratercula arctica) **Fulmar (Fulmarus glacialis)** Storm Petrel (Hydrobates pelagicus) Gannet (Morus bassanus) Leach's Petrel (Hydrobates leucorhoa) **Manx Shearwater (Puffinus puffinus)** Kittiwake (Rissa tridactyla) Great skua (Stercorarius skua) Guillemot (Uria aalge) Seabird assemblage	Razorbill - No potential for LSE as outside 164.6 km; Puffin - No potential for LSE as outside 265.4 km; **Fulmar** - Considered further as within foraging range of 1200.2 km; Storm Petrel – No potential for LSE as outside 336 km; Gannet - No potential for LSE as outside 509.4 km; Leach's Petrel – No potential for LSE as not recorded on baseline surveys; **Manx Shearwater** - Considered further as within foraging range of 2,365.5 km; Kittiwake - No potential for LSE as outside 300.6 km; Great skua - No potential for LSE as not recorded on baseline surveys; and Guillemot - No potential for LSE as outside 153.7 km.	**Yes**

European site	Distance to Offshore Site for SACs and OAA for SPAs (km)	Site's conservation objectives	Qualifying Interest(s)	Justification for why the European Site has been screened in based on the ZoI for the relevant QI	Site screened in because they are considered to have potential for LSE? (Yes/ No)
Mers Celtiques - Talus du golfe de Gascogne Site of Community Interest (SCI) which is a Nature 2000 site.	518	For all European Sites outside UK or Irish waters, a precautionary approach has been taken in this assessment and assumed a 'Restore to or maintain favourable conservation status' objective for the QI. The determination will be based upon the conservation objectives of the closest designated site with the same qualifying feature that has conservation objectives within the same MU. For reference see Blasket Islands SAC in Ireland for the conservation of objectives of these qualifying interests.	› **Phocoena phocoena (Harbour Porpoise)** › Tursiops truncatus (Common Bottlenose Dolphin)	› **Harbour porpoise** – Considered further as this SAC is within the MU for harbour porpoise; and › Bottlenose dolphin – No potential for LSE as outside the MUs for bottlenose dolphin.	Yes
Copeland Islands SPA	535.9	https://www.daera-ni.gov.uk/sites/default/files/publications/doe/copeland-islands-SPA-conservation-objectives-2015.pdf	› **Manx Shearwater (Puffinus puffinus)** › Arctic Tern (Sterna paradisaea	**Manx Shearwater** - Considered further as within foraging range of 2,365.5 km; and Arctic tern - No potential for LSE outside 40.5 km and not considered likely to pass through OAA on migration based on distance and location.	Yes
Glannau Aberdaron ac Ynys Enlli/ Aberdaron Coast and Bardsey Island SPA	547.4	For all European Sites outside UK or Irish waters, a precautionary approach has been taken in this assessment and assumed a 'Restore to or maintain favourable conservation status' objective for the QI. The determination will be based upon the conservation objectives of the closest designated site with the same qualifying feature that has conservation objectives within the same MU.	› Chough (Pyrrhocorax pyrrhocorax) › **Manx Shearwater (Puffinus puffinus)**	› **Manx Shearwater** - Considered further as within foraging range of 2,365.5 km; and › Chough - No potential for LSE as chough is a terrestrial species with no connectivity pathway.	Yes
Rockabill to Dalkey Island SAC	555.3	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO003000.pdf	› Reefs [1170] › **Phocoena phocoena (Harbour Porpoise) [1351]**	› Annex I Habitats – No potential for LSE as outside 15 km; and › **Harbour porpoise** – Considered further as this SAC is within the MU for harbour porpoise.	Yes
Shiant Isles SPA	599	https://www.nature.scot/sites/default/files/special-protection-area/8575/conservation-objectives.pdf	› Razorbill (Alca torda) › Barnacle goose (Branta leucopsis) › Puffin (Fratercula arctica) › **Fulmar (Fulmarus glacialis)** › Shag (Phalacrocorax aristotelis) › Kittiwake (Rissa tridactyla) › Guillemot (Uria aalge)	› Razorbill - No potential for LSE as outside 164.6 km; › Barnacle Goose - No potential for LSE as not considered likely to pass through OAA on migration based on distance and location of SPA; › Puffin - No potential for LSE as outside 265.4 km; › **Fulmar** - Considered further as within foraging range of 1200.2 km; › Shag - No potential for LSE as outside 23.7 km;	Yes

European site	Distance to Offshore Site for SACs and OAA for SPAs (km)	Site's conservation objectives	Qualifying Interest(s)	Justification for why the European Site has been screened in based on the ZoI for the relevant QI	Site screened in because they are considered to have potential for LSE? (Yes/ No)
				› Kittiwake - No potential for LSE as outside 300.6 km; and › Guillemot - No potential for LSE as outside 153.7 km.	
North Anglesey Marine / Gogledd Môn Forol SAC	569.2	https://cdn.cyfoethnaturiol.cymru/media/681291/n-anglesey-draft-objectives-advice.pdf?mode=pad&rnd=131625760749270000	› **Phocoena phocoena (Harbour Porpoise)**	› **Harbour porpoise** – Considered further as this SAC is within the MU for harbour porpoise.	**Yes**
Flannan Isles SPA	623.4	https://www.nature.scot/sites/default/files/special-protection-area/8502/conservation-objectives.pdf	› Razorbill (Alca torda) › Puffin (Fratercula arctica) › **Fulmar (Fulmarus glacialis)** › Leach's Petrel (Hydrobates leucorhoa) › Kittiwake (Rissa tridactyla) › Guillemot (Uria aalge)	› Razorbill - No potential for LSE as outside 164.6 km; › Puffin - No potential for LSE as outside 265.4 km; › **Fulmar** - Considered further as within foraging range of 1200.2 km; › Leach's Petrel - No potential for LSE as not recorded in OAA on baseline surveys; › Kittiwake - No potential for LSE as outside 300.6 km; and › Guillemot - No potential for LSE as outside 153.7 km.	**Yes**
Lambay Island SPA	649	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004069.pdf	› **Fulmar (Fulmarus glacialis) [A009]** › Cormorant (Phalacrocorax carbo) [A017] › Shag (Phalacrocorax aristotelis) [A018] › Greylag Goose (Anser anser) [A043] › Lesser Black-backed Gull (Larus fuscus) [A183] › Herring Gull (Larus argentatus) [A184] › Kittiwake (Rissa tridactyla) [A188] › Guillemot (Uria aalge) [A199] › Razorbill (Alca torda) [A200] › Puffin (Fratercula arctica) [A204]	› **Fulmar** - Considered further as within foraging range of 1200.2 km; › Cormorant – No potential for LSE as outside 33.9 km; › Shag - No potential for LSE as outside 23.7 km; › Greylag Goose - No potential for LSE as not considered likely to pass through OAA on migration based on distance and location of SPA; › Lesser black backed gull - No, outside 236 km; › Herring gull - No potential for LSE as outside 85.6 km; › Kittiwake - No potential for LSE as outside 300.6 km; › Guillemot – No potential for LSE as outside 153.7 km; › Razorbill - No potential for LSE as outside 164.6 km; and › Puffin - No potential for LSE as outside 265.4 km.	**Yes**
Lambay Island SAC	581.28	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO000204.pdf	› Reefs [1170] › Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] › **Phocoena phocoena (Harbour Porpoise) [1351]**	› Annex I Habitats – No potential for LSE as outside 15 km;	**Yes**

European site	Distance to Offshore Site for SACs and OAA for SPAs (km)	Site's conservation objectives	Qualifying Interest(s)	Justification for why the European Site has been screened in based on the ZoI for the relevant QI	Site screened in because they are considered to have potential for LSE? (Yes/ No)
			- Halichoerus grypus (Grey Seal) [1364] - Phoca vitulina (Harbour Seal) [1365]	- **Harbour porpoise** – Considered further as this SAC is within the MU for harbour porpoise; and - Harbour seal – No potential for LSE as outside range for harbour seal (75 km) and grey seal (200 km).	
Nord Bretagne DH SAC	618.6	https://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=FR2502022	- **Phocoena phocoena (Harbour Porpoise)** - Tursiops truncatus (Common Bottlenose Dolphin)	- **Harbour porpoise**– Considered further as this SAC is within the MU for harbour porpoise; and - Bottlenose dolphin – No potential for LSE as outside the MUs for bottlenose dolphin.	Yes
Ouessant-Molène SAC	638.8	For all European Sites outside UK or Irish waters, a precautionary approach has been taken in this assessment and assumed a 'Restore to or maintain favourable conservation status' objective for the QI. The determination will be based upon the conservation objectives of the closest designated site with the same qualifying feature that has conservation objectives within the same MU. For reference see Blasket Islands SAC in Ireland for the conservation of objectives of these qualifying interests.	- Barbastelle Bat (Barbastella barbastellus) - Greater horseshoe bat (Rhinolophus ferrumequinum) - Grey seal (*Halichoerus gryphus*) - Otter (*Lutra lutra*) - **Phocoena phocoena (Harbour Porpoise)** - Tursiops truncatus (Common Bottlenose Dolphin)	- **Harbour porpoise** – Considered further as this SAC is within the MU for harbour porpoise; - Bottlenose dolphin – No potential for LSE as outside the MUs for bottlenose dolphin; - Grey seal - No potential for LSE as outside range for grey seal (200 km); and - Eurasian otter – No potential for LSE as the Offshore Site does not overlap with the boundary of the SAC.	Yes
Ouessant-Molène SPA	727	For all European Sites outside UK or Irish waters, a precautionary approach has been taken in this assessment and assumed a 'Restore to or maintain favourable conservation status' objective for the QI. The determination will be based upon the conservation objectives of the closest designated site with the same qualifying feature that has conservation objectives within the same MU For reference see the Saltee Islands SPA in Ireland for the conservation of objectives of these qualifying interests.	- **Fulmar (Fulmarus glacialis)** - **Manx Shearwater (Puffinus puffinus)** - **All other species outside connectivity range*	- **Fulmar** - Considered further as within foraging range of 1200.2 km; - **Manx Shearwater** – Considered further as within foraging range of 2,365.5 km. -	Yes
Handa SPA	677.9	https://www.nature.scot/sites/default/files/special-protection-area/8511/conservation-objectives.pdf	- Razorbill (Alca torda) - **Fulmar (Fulmarus glacialis)** - Kittiwake (Rissa tridactyla) - Great skua (Stercorarius skua) - Guillemot (Uria aalge)	- Razorbill - No potential for LSE as outside 164.6 km; - **Fulmar** - Considered further as within foraging range of 1200.2 km; - Kittiwake - No potential for LSE as outside 300.6 km; - Great skua - No potential for LSE as not recorded in OAA on baseline surveys; - Guillemot - No potential for LSE as outside 153.7 km.	Yes

European site	Distance to Offshore Site for SACs and OAA for SPAs (km)	Site's conservation objectives	Qualifying Interest(s)	Justification for why the European Site has been screened in based on the ZoI for the relevant QI	Site screened in because they are considered to have potential for LSE? (Yes/ No)
Abers - Côte des legends SAC	653.8	For all European Sites outside UK or Irish waters, a precautionary approach has been taken in this assessment and assumed a 'Restore to or maintain favourable conservation status' objective for the QI. The determination will be based upon the conservation objectives of the closest designated site with the same qualifying feature that has conservation objectives within the same MU. For reference see Blasket Islands SAC in Ireland for the conservation of objectives of these qualifying interests.	Barbastelle Bat (Barbastella barbastellus) Grey seal (*Halichoerus gryphus*) Otter (*Lutra lutra*) Harbour seal (*Phoca vitulina*) **Phocoena phocoena (Harbour Porpoise)** Greater horseshoe bat (Rhinolophus ferrumequinum) Atlantic salmon (*Salmo salar)* Tursiops truncatus (Common Bottlenose Dolphin)	Atlantic salmon – No potential for LSE as outside 50 km; **Harbour porpoise** – Considered further as this SAC is within the MU for harbour porpoise; Bottlenose dolphin – No potential for LSE as outside the MUs for bottlenose dolphin; Pinnipeds – No potential for LSE as outside range for harbour seal (75 km) and grey seal (200 km); and Eurasian otter – No potential for LSE as the Offshore Site does not overlap with the boundary of the SAC.	**Yes**
Chaussée de Sein SAC	664.6	For all European Sites outside UK or Irish waters, a precautionary approach has been taken in this assessment and assumed a 'Restore to or maintain favourable conservation status' objective for the QI. The determination will be based upon the conservation objectives of the closest designated site with the same qualifying feature that has conservation objectives within the same MU. For reference see Blasket Islands SAC in Ireland for the conservation of objectives of these qualifying interests.	Halichoerus gryphus (Grey Seal) **Phocoena phocoena (Harbour Porpoise)** Tursiops truncatus (Common Bottlenose Dolphin)	**Harbour porpoise** – Considered further as this SAC is within the MU for harbour porpoise; Bottlenose dolphin – No potential for LSE as outside the MUs for bottlenose dolphin; and Grey seal – No potential for LSE as outside range for grey seal (200 km).	**Yes**
Cape Wrath SPA	704.5	https://www.nature.scot/sites/default/files/special-protection-area/8481/conservation-objectives.pdf	Razorbill (Alca torda) Puffin (Fratercula arctica) **Fulmar (Fulmarus glacialis)** Kittiwake (Rissa tridactyla) Guillemot (Uria aalge)	Razorbill - No potential for LSE as outside 164.6 km; Puffin - No potential for LSE as outside 265.4 km; **Fulmar** - Considered further as within foraging range of 1200.2 km; Kittiwake - No potential for LSE as outside 300.6 km; and Guillemot - No potential for LSE as outside 153.7 km.	**Yes**
Cote de Granit Rose-Sept Iles SPA	779	For all European Sites outside UK or Irish waters, a precautionary approach has been taken in this assessment and assumed a 'Restore to or maintain favourable conservation status' objective for the QI. The determination will be based upon the conservation objectives of the closest designated site with the same qualifying feature that has conservation objectives within the same MU.	**Fulmar (Fulmarus glacialis)** **Manx Shearwater (Puffinus puffinus)** **All other species outside connectivity range*	**Fulmar** - Considered further as within foraging range of 1200.2 km; **Manx Shearwater** - Considered further as within foraging range of 2,365.5 km;	**Yes**

European site	Distance to Offshore Site for SACs and OAA for SPAs (km)	Site's conservation objectives	Qualifying Interest(s)	Justification for why the European Site has been screened in based on the ZoI for the relevant QI	Site screened in because they are considered to have potential for LSE? (Yes/ No)
		For reference see the Saltee Islands SPA in Ireland for the conservation of objectives of these qualifying interests			
Côte de Granit rose-Sept-Iles SAC	676.8	For all European Sites outside UK or Irish waters, a precautionary approach has been taken in this assessment and assumed a 'Restore to or maintain favourable conservation status' objective for the QI. The determination will be based upon the conservation objectives of the closest designated site with the same qualifying feature that has conservation objectives within the same MU. For reference see Blasket Islands SAC in Ireland for the conservation of objectives of these qualifying interests.	Alosa alosa (Allis Shad) Alosa fallax (Shad) Halichoerus gryphus (Grey Seal) Petromyzon marinus (Sea Lamprey) Phoca vitulina (Harbour seal) **Phocoena phocoena (Harbour Porpoise)** Rhinolophus hipposideros (Lesser Horseshoe Bat) Rhinolophus ferrumequinum (Greater Horseshoe Bat) Salmo salar (Atlantic salmon) Tursiops truncatus (Common Bottlenose Dolphin)	Diadromous fish – No potential for LSE as outside 50 km; **Harbour porpoise** – Considered further as this SAC is within the MU for harbour porpoise; Bottlenose dolphin – No potential for LSE as outside the MUs for bottlenose dolphin; and Pinnipeds – No potential for LSE as outside range for grey seal (200 km) and harbour seal (75 km).	**Yes**
Baie de Morlaix SAC	679.2	For all European Sites outside UK or Irish waters, a precautionary approach has been taken in this assessment and assumed a 'Restore to or maintain favourable conservation status' objective for the QI. The determination will be based upon the conservation objectives of the closest designated site with the same qualifying feature that has conservation objectives within the same MU. For reference see Blasket Islands SAC in Ireland for the conservation of objectives of these qualifying interests.	Alosa alosa (Allis Shad) Alosa fallax (Shad) Barbastelle Bat (Barbastella barbastellus) Halichoerus gryphus (Grey Seal) Lutra lutra (Eurasian otter) Petromyzon marinus (Sea Lamprey) **Phocoena phocoena (Harbour Porpoise)** Rhinolophus hipposideros (Lesser Horseshoe Bat) Rhinolophus ferrumequinum (Greater Horseshoe Bat) Salmo salar (Atlantic salmon)	Diadromous fish – No potential for LSE as outside 50 km; **Harbour porpoise** – Considered further as this SAC is within the MU for harbour porpoise; Grey seal – No potential for LSE as outside range for grey seal (200 km); Eurasian otter – No potential for LSE as the Offshore Site does not overlap with the boundary of the SAC.	**Yes**
Côtes de Crozon SAC	683.7	For all European Sites outside UK or Irish waters, a precautionary approach has been taken in this assessment and assumed a 'Restore to or maintain favourable conservation status' objective for the QI. The determination will be based upon the conservation objectives of the closest designated site with the same qualifying feature that has conservation objectives within the same MU. For reference see Blasket Islands SAC in Ireland for the conservation of objectives of these qualifying interests.	Halichoerus gryphus (Grey Seal) Lutra lutra (Eurasian otter) **Phocoena phocoena (Harbour Porpoise)** Rhinolophus ferrumequinum (Greater Horseshoe Bat) Tursiops truncatus (Common Bottlenose Dolphin)	**Harbour porpoise** – Considered further as this SAC is within the MU for harbour porpoise; Bottlenose dolphin – No potential for LSE as outside the MUs for bottlenose dolphin; Grey seal – No potential for LSE as outside range for grey seal (200 km); and Eurasian otter – No potential for LSE as the Offshore Site does not overlap with the boundary of the SAC.	**Yes**
Camaret SPA	701	For all European Sites outside UK or Irish waters, a precautionary approach has been taken in this assessment and assumed a 'Restore to or maintain favourable conservation status' objective for the QI. The determination will be based upon the conservation objectives of the closest designated site with the same	**Fulmar (Fulmarus glacialis)** **All other species outside connectivity range*	**Fulmar** - Considered further as within foraging range of 1200.2 km.	**Yes**

European site	Distance to Offshore Site for SACs and OAA for SPAs (km)	Site's conservation objectives	Qualifying Interest(s)	Justification for why the European Site has been screened in based on the ZoI for the relevant QI	Site screened in because they are considered to have potential for LSE? (Yes/ No)
		qualifying feature that has conservation objectives within the same MU For reference see the Saltee Islands SPA in Ireland for the conservation of objectives of these qualifying interests.			
North Rona and Sula Sgeir SPA	689.1	https://www.nature.scot/sites/default/files/special-protection-area/8558/conservation-objectives.pdf	- Razorbill (Alca torda) - Puffin (Fratercula arctica) - **Fulmar (Fulmarus glacialis)** - Storm Petrel (Hydrobates pelagicus) - Great black-backed gull (Larus marinus) - Gannet (Morus bassanus) - Leach's Petrel (Hydrobates leucorhoa) - Kittiwake (Rissa tridactyla) - Guillemot (Uria aalge)	- Razorbill - No potential for LSE as outside 164.6 km; - Puffin - No potential for LSE as outside 265.4 km; - **Fulmar** - Considered further as within foraging range of 1200.2 km; - Storm Petrel - No potential for LSE as outside 336 km; - Great black-backed gull - No potential for LSE as outside 73 km; - Gannet - No potential for LSE as outside 509.4 km; - Leach's Petrel - No potential for LSE not recorded in OAA on baseline surveys; - Kittiwake - No potential for LSE as outside 300.6 km; and - Guillemot - No potential for LSE as outside 153.7 km.	**Yes**
North Caithness Cliffs SPA	771	https://www.nature.scot/sites/default/files/special-protection-area/8554/conservation-objectives.pdf	- Razorbill (Alca torda) - Peregrine (Falco peregrinus) - Puffin (Fratercula arctica) - **Fulmar (Fulmarus glacialis)** - Kittiwake (Rissa tridactyla) - Guillemot (Uria aalge)	- Razorbill - No potential for LSE as outside 164.6 km; - Puffin - No potential for LSE as outside 265.4 km; - **Fulmar** - Considered further as within foraging range of 1200.2 km; - Kittiwake - No potential for LSE as outside 300.6 km; - Guillemot - No potential for LSE as outside 153.7 km; and - Peregrine - No potential for LSE as peregrine is a terrestrial species with no connectivity pathway.	**Yes**
Hoy SPA	810.2	https://www.nature.scot/sites/default/files/special-protection-area/8513/conservation-objectives.pdf	- Great skua (Stercorarius skua) - Peregrine (Falco peregrinus) - Puffin (Fratercula arctica) - **Fulmar (Fulmarus glacialis)** - Red-throated diver (Gavia stellata) - Great black-backed gull (Larus marinus) - Kittiwake (Rissa tridactyla) - Arctic skua (Stercorarius parasiticus) - Guillemot (Uria aalge)	- Great skua - No potential for LSE as not recorded on baseline surveys; - Puffin - No potential for LSE as outside 265.4 km; - **Fulmar** - Considered further as within foraging range of 1200.2 km; - Red-throated diver - No potential for LSE as not recorded in OAA on baseline surveys;	**Yes**

European site	Distance to Offshore Site for SACs and OAA for SPAs (km)	Site's conservation objectives	Qualifying Interest(s)	Justification for why the European Site has been screened in based on the ZoI for the relevant QI	Site screened in because they are considered to have potential for LSE? (Yes/ No)
			Seabird assemblage	Great black-backed gull - No potential for LSE as outside 73 km; Kittiwake - No potential for LSE as outside 300.6 km; Arctic skua - No potential for LSE as not recorded in OAA on baseline surveys; Guillemot - No potential for LSE as outside 153.7 km; and Peregrine - No potential for LSE as peregrine is a terrestrial species with no connectivity pathway.	
Récifs et landes de la Hague SAC	770.9	For all European Sites outside UK or Irish waters, a precautionary approach has been taken in this assessment and assumed a 'Restore to or maintain favourable conservation status' objective for the QI. The determination will be based upon the conservation objectives of the closest designated site with the same qualifying feature that has conservation objectives within the same MU. For reference see Blasket Islands SAC in Ireland for the conservation of objectives of these qualifying interests.	Halichoerus gryphus (Grey Seal) Lutra lutra (Eurasian otter) Phoca vitulina (Harbour seal) Myotis bechsteinii (Bechstein's bat) Myotis emarginatus (Geoffroy's bat) Myotis myotis (Greater mouse-eared bat) **Phocoena phocoena (Harbour Porpoise)** Rhinolophus ferrumequinum (Greater Horseshoe Bat) Tursiops truncatus (Common Bottlenose Dolphin)	**Harbour porpoise** – Considered further as this SAC is within the MU for harbour porpoise; Bottlenose dolphin – No potential for LSE as outside the MUs for bottlenose dolphin; Pinnipeds – No potential for LSE as outside range for harbour seal (75 km) and grey seal (200 km); and Eurasian otter – No potential for LSE as the Offshore Site does not overlap with the boundary of the SAC.	**Yes**
Cap d'Erquy-Cap Fréhel SPA	855	For all European Sites outside UK or Irish waters, a precautionary approach has been taken in this assessment and assumed a 'Restore to or maintain favourable conservation status' objective for the QI. The determination will be based upon the conservation objectives of the closest designated site with the same qualifying feature that has conservation objectives within the same MU. For reference see the Saltee Islands SPA in Ireland for the conservation of objectives of these qualifying interests	**Fulmar (Fulmarus glacialis)** **All other species outside connectivity range*	**Fulmar** - Considered further as within foraging range of 1200.2 km	**Yes**
Anse de Vauville SAC	771.6	For all European Sites outside UK or Irish waters, a precautionary approach has been taken in this assessment and assumed a 'Restore to or maintain favourable conservation status' objective for the QI. The determination will be based upon the conservation objectives of the closest designated site with the same qualifying feature that has conservation objectives within the same MU.	Halichoerus gryphus (Grey Seal) Phoca vitulina (Harbour seal) **Phocoena phocoena (Harbour Porpoise)** Tursiops truncatus (Common Bottlenose Dolphin)	**Harbour porpoise** – Considered further as this SAC is within the MU for harbour porpoise; Bottlenose dolphin – No potential for LSE as outside the MUs for bottlenose dolphin; and Pinnipeds – No potential for LSE as outside range for harbour seal (75 km) and grey seal (200 km).	**Yes**

European site	Distance to Offshore Site for SACs and OAA for SPAs (km)	Site's conservation objectives	Qualifying Interest(s)	Justification for why the European Site has been screened in based on the ZoI for the relevant QI	Site screened in because they are considered to have potential for LSE? (Yes/ No)
		For reference see Blasket Islands SAC in Ireland for the conservation of objectives of these qualifying interests.			
Banc et récifs de Surtainville SAC	772.9	For all European Sites outside UK or Irish waters, a precautionary approach has been taken in this assessment and assumed a 'Restore to or maintain favourable conservation status' objective for the QI. The determination will be based upon the conservation objectives of the closest designated site with the same qualifying feature that has conservation objectives within the same MU. For reference see Blasket Islands SAC in Ireland for the conservation of objectives of these qualifying interests.	Halichoerus gryphus (Grey Seal) Phoca vitulina (Harbour seal) **Phocoena phocoena (Harbour Porpoise)** Tursiops truncatus (Common Bottlenose Dolphin)	**Harbour porpoise** – Considered further as this SAC is within the MU for harbour porpoise; Bottlenose dolphin – No potential for LSE as outside the MUs for bottlenose dolphin; and Pinnipeds – No potential for LSE as outside range for harbour seal (75 km) and grey seal (200 km).	**Yes**
Other SACs in France which overlap with the CIS MU for harbour porpoise: • Baie du Mont Saint-Michel SAC • Estuaire de la Rance SAC • Baie de Lancieux Baie de l'Arguenon SAC Archipel de Saint Malo et Dinard SAC • Cap d'Erquy-Cap Fréhel SAC • Baie de Saint-Brieuc SAC • Tregor Goëlo Es SAC	ca. 700	For all European Sites outside UK or Irish waters, a precautionary approach has been taken in this assessment and assumed a 'Restore to or maintain favourable conservation status' objective for the QI. The determination will be based upon the conservation objectives of the closest designated site with the same qualifying feature that has conservation objectives within the same MU. For reference see Blasket Islands SAC in Ireland for the conservation of objectives of these qualifying interests.	**Phocoena phocoena (Harbour Porpoise)** **All other species outside connectivity range*	**Harbour porpoise** – Considered further as this SAC is within the MU for harbour porpoise	**Yes**
Rousay SPA	859.5	https://www.nature.scot/sites/default/files/special-protection-area/8573/conservation-objectives.pdf	**Fulmar (Fulmarus glacialis)** Kittiwake (Rissa tridactyla) Arctic skua (Stercorarius parasiticus) Arctic Tern (Sterna paradisaea)	**Fulmar** - Considered further as within foraging range of 1200.2 km; Kittiwake - No potential for LSE as outside 300.6 km;	**Yes**

European site	Distance to Offshore Site for SACs and OAA for SPAs (km)	Site's conservation objectives	Qualifying Interest(s)	Justification for why the European Site has been screened in based on the ZoI for the relevant QI	Site screened in because they are considered to have potential for LSE? (Yes/ No)
			Guillemot (Uria aalge)	Arctic skua - No potential for LSE as not recorded in OAA on baseline surveys; Arctic tern - No potential for LSE as outside 40.5 km; and Guillemot - No potential for LSE as outside 154 km.	
West Westray SPA	864.5	https://www.nature.scot/sites/default/files/special-protection-area/8589/conservation-objectives.pdf	Razorbill (Alca torda) **Fulmar (Fulmarus glacialis)** Kittiwake (Rissa tridactyla) Arctic skua (Stercorarius parasiticus) Arctic Tern (Sterna paradisaea) Guillemot (Uria aalge)	Razorbill - No potential for LSE as outside 164.6 km; **Fulmar** - Considered further as within foraging range of 1200.2 km; Kittiwake - No potential for LSE as outside 300.6 km; Arctic skua - No potential for LSE as not recorded in OAA on baseline surveys; Arctic tern - No potential for LSE as outside 40.5 km; and Guillemot - No potential for LSE as outside 153.7 km.	**Yes**
Copinsay SPA	908.9	https://www.nature.scot/sites/default/files/special-protection-area/8485/conservation-objectives.pdf	**Fulmar (Fulmarus glacialis)** Great black-backed gull (Larus marinus) Kittiwake (Rissa tridactyla) Guillemot (Uria aalge) Seabird assemblage	**Fulmar** - Considered further as within foraging range of 1200.2 km; Great black-backed gull - No potential for LSE as outside 73 km; Kittiwake – No potential for LSE as outside 300.6 km; and Guillemot - No potential for LSE as outside 153.7 km.	**Yes**
East Caithness Cliffs SPA	871.1	https://www.nature.scot/sites/default/files/special-protection-area/8492/conservation-objectives.pdf	Razorbill (Alca torda) Peregrine (Falco peregrinus) **Fulmar (Fulmarus glacialis)** Herring Gull (Larus argentatus) Great black-backed gull (Larus marinus) Shag (Phalacrocorax aristotelis) Cormorant (Phalacrocorax carbo) Kittiwake (Rissa tridactyla) Guillemot (Uria aalge)	Razorbill - No potential for LSE as outside 164.6 km; **Fulmar** - Considered further as within foraging range of 1200.2 km; Herring gull - No potential for LSE as outside 85.6 km; Great black-backed gull - No potential for LSE as outside 73 km; Shag - No potential for LSE as outside 23.7 km; Cormorant - No potential for LSE as outside 33.9 km; Kittiwake - No potential for LSE as outside 300.6 km; Guillemot - No potential for LSE as outside 153.7 km; and Peregrine - No potential for LSE as peregrine is a terrestrial species with no connectivity pathway.	**Yes**

European site	Distance to Offshore Site for SACs and OAA for SPAs (km)	Site's conservation objectives	Qualifying Interest(s)	Justification for why the European Site has been screened in based on the ZoI for the relevant QI	Site screened in because they are considered to have potential for LSE? (Yes/ No)
Calf of Eday SPA	869.3	https://www.nature.scot/sites/default/files/special-protection-area/8478/conservation-objectives.pdf	**Fulmar (Fulmarus glacialis)** Great black-backed gull (Larus marinus) Cormorant (Phalacrocorax carbo) Kittiwake (Rissa tridactyla) Guillemot (Uria aalge)	**Fulmar** - Considered further as within foraging range of 1200.2 km; Great black-backed gull - No potential for LSE as outside 73 km; Cormorant - No potential for LSE as outside 33.9 km; Kittiwake - No potential for LSE as outside 300.6 km; and Guillemot - No potential for LSE as outside 153.7 km.	Yes
Iles Houat-Hoedic SPA	879.9	For all European Sites outside UK or Irish waters, a precautionary approach has been taken in this assessment and assumed a 'Restore to or maintain favourable conservation status' objective for the QI. The determination will be based upon the conservation objectives of the closest designated site with the same qualifying feature that has conservation objectives within the same MU. For reference see the Saltee Islands SPA in Ireland for the conservation of objectives of these qualifying interests	**Manx Shearwater (Puffinus puffinus)** **All other species outside connectivity range*	**Manx Shearwater** - Considered further as within foraging range of 2,365.5 km.	Yes
Falaise du Bessin Occidental SPA	936.8	For all European Sites outside UK or Irish waters, a precautionary approach has been taken in this assessment and assumed a 'Restore to or maintain favourable conservation status' objective for the QI. The determination will be based upon the conservation objectives of the closest designated site with the same qualifying feature that has conservation objectives within the same MU. For reference see the Saltee Islands SPA in Ireland for the conservation of objectives of these qualifying interests.	**Fulmar (Fulmarus glacialis)** **All other species outside connectivity range*	**Fulmar** - Considered further as within foraging range of 1200.2 km.	Yes
Seas off Foula SPA	893.7	https://data.jncc.gov.uk/data/a4ddbc00-500a-4c4b-9250-ed180356db00/seas-off-foula-sas-conservation-objectives-reg-18.pdf	Puffin (Fratercula arctica) **Fulmar (Fulmarus glacialis)** Arctic skua (Stercorarius parasiticus) Great skua (Stercorarius skua) Guillemot (Uria aalge)	**Fulmar** - Considered further as within foraging range of 1200.2 km. Puffin - No potential for LSE as outside 265.4 km; Great skua - No potential for LSE as not recorded in OAA on baseline survey; Arctic skua - No potential for LSE as not recorded in OAA on baseline surveys; and Guillemot - No potential for LSE as outside 153.7 km.	Yes

European site	Distance to Offshore Site for SACs and OAA for SPAs (km)	Site's conservation objectives	Qualifying Interest(s)	Justification for why the European Site has been screened in based on the ZoI for the relevant QI	Site screened in because they are considered to have potential for LSE? (Yes/ No)
Fair Isle SPA	975.9	https://www.nature.scot/sites/default/files/special-protection-area/8496/conservation-objectives.pdf	Razorbill (Alca torda) Puffin (Fratercula arctica) **Fulmar (Fulmarus glacialis)** Gannet (Morus bassanus) Shag (Phalacrocorax aristotelis) Kittiwake (Rissa tridactyla) Arctic skua (Stercorarius parasiticus) Great skua (Stercorarius skua) Arctic Tern (Sterna paradisaea) Fair Isle Wren (Troglodytes troglodytes fridariensis) Guillemot (Uria aalge)	Razorbill - No potential for LSE as outside 164.6 km; Puffin - No potential for LSE as outside 265.4 km; **Fulmar** - Considered further as within foraging range of 1200.2 km; Gannet - No potential for LSE as outside 509.4 km; Shag - No potential for LSE as outside 23.7 km; Kittiwake - No potential for LSE as outside 300.6 km; Arctic skua - No potential for LSE as not recorded in OAA on baseline surveys; Great skua - No potential for LSE as not recorded in OAA on baseline surveys; Arctic tern - No potential for LSE as outside 40.5 km; and Guillemot - No potential for LSE as outside 153.7 km.	**Yes**
Littoral seino-marin SPA	1,030.3	For all European Sites outside UK or Irish waters, a precautionary approach has been taken in this assessment and assumed a 'Restore to or maintain favourable conservation status' objective for the QI. The determination will be based upon the conservation objectives of the closest designated site with the same qualifying feature that has conservation objectives within the same MU. For reference see the Saltee Islands SPA in Ireland for the conservation of objectives of these qualifying interests.	**Fulmar (Fulmarus glacialis)** **All other species outside connectivity range or do not breed at the site*	**Fulmar** - Considered further as within foraging range of 1200.2 km	**Yes**
Troup, Pennan and Lion's Heads SPA	1,185.5	https://www.nature.scot/sites/default/files/special-protection-area/8587/conservation-objectives.pdf	Razorbill (Alca torda) **Fulmar (Fulmarus glacialis)** Herring Gull (Larus argentatus) Kittiwake (Rissa tridactyla) Guillemot (Uria aalge)	Razorbill - No potential for LSE as outside 164.6 km; **Fulmar** - Considered further as within foraging range of 1200.2 km; Herring gull - No potential for LSE as outside 85.6 km; Kittiwake - No potential for LSE as outside 300.6 km; and Guillemot - No potential for LSE as outside 153.7 km.	**Yes**
Foula SPA	924.5	https://data.jncc.gov.uk/data/a4ddbc00-500a-4c4b-9250-ed180356db00/seas-off-foula-sas-conservation-objectives-reg-18.pdf	Razorbill (Alca torda) Puffin (Fratercula arctica) **Fulmar (Fulmarus glacialis)**	Razorbill - No potential for LSE as outside 164.6 km; Puffin - No potential for LSE as outside 265.4 km;	**Yes**

European site	Distance to Offshore Site for SACs and OAA for SPAs (km)	Site's conservation objectives	Qualifying Interest(s)	Justification for why the European Site has been screened in based on the ZoI for the relevant QI	Site screened in because they are considered to have potential for LSE? (Yes/ No)
			Red-throated diver (Gavia stellata) Leach's Petrel (Hydrobates leucorhoa) Shag (Phalacrocorax aristotelis) Kittiwake (Rissa tridactyla) Arctic skua (Stercorarius parasiticus) Great skua (Stercorarius skua) Arctic Tern (Sterna paradisaea) Guillemot (Uria aalge)	**Fulmar** - Considered further as within foraging range of 1200.2 km; Red-throated diver - No potential for LSE as not recorded in OAA on baseline surveys; Leach's Petrel – No potential for LSE as not recorded in OAA on baseline surveys; Shag - No potential for LSE as outside 23.7 km; Kittiwake - No potential for LSE as outside 300.6 km; Arctic skua - No potential for LSE as not recorded in OAA on baseline surveys; Great skua - No potential for LSE as not recorded in OAA on baseline surveys; Arctic tern - No potential for LSE as outside 40.5 km; and Guillemot - No potential for LSE as outside 153.7 km.	
Sumburgh Head SPA	963.7	https://www.nature.scot/sites/default/files/special-protection-area/8582/conservation-objectives.pdf	**Fulmar (Fulmarus glacialis)** Kittiwake (Rissa tridactyla) Arctic Tern (Sterna paradisaea) Guillemot (Uria aalge)	**Fulmar** - Considered further as within foraging range of 1200.2 km; Kittiwake - No potential for LSE as outside 300.6 km; Arctic tern - No potential for LSE as outside 40.5 km; and Guillemot - No potential for LSE as outside 153.7 km.	**Yes**
Buchan Ness to Collieston Coast SPA	1,032.1	https://www.nature.scot/sites/default/files/special-protection-area/8473/conservation-objectives.pdf	**Fulmar (Fulmarus glacialis)** Herring Gull (Larus argentatus) Shag (Phalacrocorax aristotelis) Kittiwake (Rissa tridactyla) Guillemot (Uria aalge)	**Fulmar** - Considered further as within foraging range of 1200.2 km; Herring gull - No potential for LSE as outside 85.66 km; Shag - No potential for LSE as outside 23.7 km; Kittiwake - No potential for LSE as outside 300.6 km; Guillemot - No potential for LSE as outside 153.7 km.	**Yes**
Noss SPA	976.5	https://www.nature.scot/sites/default/files/special-protection-area/8561/conservation-objectives.pdf	Puffin (Fratercula arctica) **Fulmar (Fulmarus glacialis)** Gannet (Morus bassanus) Kittiwake (Rissa tridactyla) Great skua (Stercorarius skua) Guillemot (Uria aalge)	Puffin - No potential for LSE as outside 265.4 km; **Fulmar** – Considered further as within 1200.2 km; Gannet - No potential for LSE as outside 509.4 km; Kittiwake - No potential for LSE as outside 300.6 km;	**Yes**

European site	Distance to Offshore Site for SACs and OAA for SPAs (km)	Site's conservation objectives	Qualifying Interest(s)	Justification for why the European Site has been screened in based on the ZoI for the relevant QI	Site screened in because they are considered to have potential for LSE? (Yes/ No)
				Great skua - No potential for LSE not recorded in OAA on baseline surveys; and Guillemot - No potential for LSE as outside 153.7 km.	
Fetlar SPA	993	https://www.nature.scot/sites/default/files/special-protection-area/8498/conservation-objectives.pdf	Dunlin (Calidris alpina schinzii) **Fulmar (Fulmarus glacialis)** Red-necked Phalarope (Phalaropus lobatus) Whimbrel (Numenius phaeopus) Arctic skua (Stercorarius parasiticus) Great skua (Stercorarius skua) Arctic Tern (Sterna paradisaea)	**Fulmar** - Considered further as within foraging range of 1200.2 km; Arctic skua - No potential for LSE as not recorded in OAA on baseline surveys; Great skua - No potential for LSE as not recorded in OAA on baseline surveys; Arctic tern - No potential for LSE as outside 40.5 km; and Whimbrel, dunlin and red-necked phalarope - No potential for LSE as these species are not likely to pass through the OAA on migration based on distance and location of SPA.	**Yes**
Hermaness, Saxa Vord and Valla Field SPA	1,044.5	https://www.nature.scot/sites/default/files/special-protection-area/8512/conservation-objectives.pdf	Great skua (Stercorarius skua) Puffin (Fratercula arctica) **Fulmar (Fulmarus glacialis)** Red-throated diver (Gavia stellata) Gannet (Morus bassanus) Shag (Phalacrocorax aristotelis) Kittiwake (Rissa tridactyla) Guillemot (Uria aalge)	Great skua - No potential for LSE as not recorded on baseline surveys; Puffin - No potential for LSE as outside 265.4 km; **Fulmar** - Considered further as within foraging range of 1200.2 km; Red-throated diver - No potential for LSE as not recorded on baselines surveys; Gannet - No potential for LSE as outside 509.4 km; Shag - No potential for LSE as outside 23.7 km; Kittiwake - No potential for LSE as outside 300.6 km; and Guillemot - No potential for LSE as outside 153.7 km.	**Yes**
Fowlsheugh SPA	1,266	https://www.nature.scot/sites/default/files/special-protection-area/8505/conservation-objectives.pdf	Razorbill (Alca torda) Fulmar (Fulmarus glacialis) Herring Gull (Larus argentatus) Kittiwake (Rissa tridactyla) Guillemot (Uria aalge)	Razorbill - No potential for LSE as outside 164.6 km; Fulmar - No potential for LSE as outside 1200.2 km; Herring gull - No potential for LSE as outside 85.6 km; Kittiwake - No potential for LSE as outside 300.6 km; and Guillemot - No potential for LSE as outside 153.7 km.	No

The European sites listed in Table 3-1 are considered to have connectivity with the Offshore Site and thus have been taken forward for further assessment in the NIS to determine the potential for adverse effect on their integrity. All QIs of each SPA/SAC have been considered when determining the potential for LSE on the European Site. It is however determined and set out in further detail in Table 3-1 that there is no potential for LSE on any QI that have no connectivity to the Offshore Site of the Project, either directly or indirectly. Having examined the potential impacts and pathways it is our considered view that there will be no likely impact or interaction from the Offshore Site of the Project and these QIs. A direct effect on site integrity is only possible through impacts on the QIs which are assessed in the following section of this NIS.

The following sections present the assessment to determine the potential for adverse effect on site integrity, as broken down by receptor group, with reference to relevant European Sites. This approach was taken to streamline the assessment due to the number of impact pathways, sites and QIs with potential connectivity to the Project. While impacts on each QI are assessed separately, the potential for adverse effect on the integrity of any particular European Site is considered holistically, taking into account the conservation objectives of the sites, and an assessment of the impacts of the Offshore Site together with the Onshore Site (i.e. entire Project) and in combination with other plans or projects was also carried out.

Each section provides a summary table detailing the receptor-specific impact pathways associated with each Project phase (e.g. pre-construction, construction and decommissioning (C&D) and operation and maintenance (O&M)). Where it has been determined that there is a potential pathway for LSE, the applicable European sites and qualifying interests for which there may be adverse effect have been assessed and are presented. Where pathway to LSE is referenced in the tables and sections below, this assessment is based on source-pathway-receptor model for potential impacts pathways.

3.1 European Sites Designated for Annex I Habitats

As presented in Table 3-1, the assessment of connectivity resulted in eight European sites (SACs) which are considered to have connectivity to the Offshore Site. Marine and coastal QIs have been divided and are considered as follows:

Marine habitats - The assessment has considered potential impact pathways on the subtidal and intertidal Annex I habitats identified as qualifying interests of the European sites, including sandbanks which are slightly covered by seawater at all times, estuaries, Atlantic and Mediterranean salt meadows, mudflats and sandflats not covered by seawater at low tide, coastal lagoons, large shallow inlets and bays and reefs).

All other habitats – While there is a pathway between marine physical processes and intertidal habitats, e.g. from sedimentation, the potential for interaction with shore and terrestrial habitats (e.g. Perennial vegetation of stony banks, sand dunes, freshwater habitats, grasses and vegetation, bogs, etc.) has not been taken forward to the assessment as these features have no impact pathways to the Offshore Site of the Project.

3.1.1 Annex I Habitats - LSE pathways

The long list of potential impact pathways that could lead to LSE on the Annex I QI of European Sites have been summarised in Table 3-2. Where an impact pathway is identified, this will be further assessed in this NIS.

Table 3-2 Potential impacts pathways on Annex I habitat QIs from the Offshore Site construction, operation and maintenance and decommissioning phases

Potential Impact Pathway	Description of potential impact pathways	Pathway to LSE (yes/no)
	Construction	
Temporary habitat or species loss / disturbance Long term loss / damage to benthic habitats and species	Any disturbance occurring from increases in vessel traffic and other construction or decommissioning activities are expected to be highly localised and temporary in nature. Temporary benthic habitat/ species loss or disturbance may be caused by seabed preparation activities (e.g. boulder clearance and PLGR) and deployment of jack up spud cans, stonebed and GB foundations. The seabed will also be disturbed during the installation of cables and cable protection. These impacts are however restricted the Offshore Site, and while the effect is long-term, the effect will occur over a highly localised scale at a low frequency (i.e. occurring once). No temporary habitat loss or disturbance outside the site boundary is expected. Similarly, any potential long-term loss or damage to benthic habitats and species is restricted to the site boundary. Therefore no potential LSE from habitat or species loss / disturbance due to the Offshore Site construction or decommissioning phase in expected due to the SACs with Annex I habitats QIs being located outside the Offshore Site boundary.	No
Increased Suspended Sediment Concentrations (SSC) and associated deposition	Sediment disturbance during seabed preparation and installation activities will result in increased SSC. Annex I Habitat QIs may be directly or indirectly effected by the increased SSCs, such as indirect temporary disturbance or as a result of smothering. The seabed preparation activities including boulder clearance, PLGR, dredging and stonebed rock placement, deposit of dredged material and installation of infrastructure such as the placement of gravity-based foundations, scour protection, cable trenching for the IAC and OEC, and placement of rock protection will disturb seabed sediments and result in a temporary increase in SSC. Due to the relatively low fines found across the OAA and OECC, only a very small proportion of the total excavated sediment volume will enter suspension and be distributed in a temporary plume over a range of up to 15 km from the ejection point. Increased SSC will be brief (i.e. less than a day), with return to background levels thereafter. Any habitats located in the intertidal marine environment which are subject to varying levels of natural impacts from storms and wave activity, or habitats located in the upper-most level of saltmarshes are unlikely to be affected by increased SSC concentrations (European and Atlantic salt meadows). No impact pathway from SSC to these habitats are therefore predicted. Other habitats may be more susceptible to smothering by sediment and a pathway to LSE can be expected.	Yes
Effects of accidental release of pollutants	Accidental releases of pollutants may arise as a result of accidental spills from vessels or other equipment and have detrimental effects on nearby Annex I Habitat QI. As the presence of vessels is not expected to be above the existing baseline traffic of vessels in the area, the likelihood of the impact to occur is thus very low. Furthermore, the likelihood of the WTG releasing the potential for full inventory pollutants for any individual turbine is considered extremely rare. The potential slow release of fluids is considered the only avenue through which pollution or discharge would enter the water column and sediment. For these reasons, the effects of pollution or accidental discharge to the benthic ecology has not been considered further as it does not present a pathway to LSE.	No

Increased risk of introduction and spread of Invasive and Non-Native Species (INNS)	There is potential for the increased risk of introduction and spread of INNS as a result of seabed preparation and construction activities. Marine INNS may be introduced or transferred by vessels, such as through biofouling (e.g. attachment of organisms to boat hulls) or discharge of ballast water. INNS may also be introduced through towing of infrastructure to the site and as such the impacts are not restricted to the Offshore Site boundary. INNS can have a detrimental effect on benthic ecology through predation on existing wildlife or outcompeting for prey and habitat. This can result in biodiversity changes in the existing habitats present in the benthic ecology study area. Depending on the INNS species introduced, this could potentially lead to complete loss of certain species and may result in new habitats forming (e.g. reef-forming species or invasive vegetation). Kelly et al., (2013) provided a risk analysis for INNS in Ireland and Northern Ireland, in which the authors identified high risk species based on recorded species and potential species. The high-risk marine INNS which have been recorded in Ireland include the carpet sea squirt (Didemnum vexillum), the slipper limpet (Crepidula fornicate), the leathery sea squirt (Styela clava). The carpet sea squirt and leathery sea squirt are a species of colonial sea squirt, which are native to Asia and can outcompete and smother native biological communities on rocky substrates. This species can form extensive mats over the substrata it colonises, binding boulders and cobbles and altering the host habitat (Griffith et al., 2009). Therefore the carpet sea squirt and leathery sea squirt are expected to pose the greatest threat to reef biodiversity. Mudflats and sandflats on the other hand may be sensitive to invasion by Spartina anglica which would alter the character of the mudflat and the biological assemblage. There is a lack of evidence to assess the resistance, resilience and sensitivity of large shallow inlets and bays, coastal lagoons and Atlantic and Mediterranean salt meadows to impacts arising from the increased risk of introduction and spread of INNS. Activities will be short-term in duration (i.e. occurring throughout construction activities which will last for approximately 41 months); although the introduction of INNS may occur, it is very unlikely. Given that stony and bedrock reef are susceptible to the high-risk INNS, stony and bedrock reef is considered to have a low capacity to accommodate the effect with low ability to recover or adapt. Therefore, stony and bedrock reef is considered to be of high sensitivity to this impact pathway. Overall, it is concluded that increased risk of introduction and spread of INNS presents a potential pathway for LSE.	Yes
Operation, Maintenance and Decommissioning		
Hydrodynamic changes leading to scour around subsea infrastructure	Localised movement of seabed as a result of infrastructure placements relating to the Project. As all of the infrastructure is placed within the Offshore Site boundary, no impacts on SACs outside the site are expected. Therefore, it is concluded that this impact presents no potential pathway for LSE.	No
Temporary habitat or species loss / disturbance	Any disturbance occurring from increases in vessel traffic and other construction or decommissioning activities are expected to be highly localised and temporary in nature. Temporary benthic habitat/ species loss or disturbance may be caused by seabed preparation activities (e.g. boulder clearance and PLGR) and deployment of jack up spud cans, stonebed and GB foundations. The seabed will also be disturbed during the installation of cables and cable protection. These impacts are however restricted the Offshore Site, and while the effect is long-term, the effect will occur over a highly localised scale at a low frequency (i.e. occurring once). No temporary habitat loss or disturbance outside the site boundary is expected.	No

	Similarly, any potential long-term loss or damage to benthic habitats and species is restricted to the site boundary. Therefore no potential LSE from habitat or species loss / disturbance due to the Offshore Site operational and maintenance phase in expected due to the SACs with Annex I habitats QIs being located outside the Offshore Site boundary.	
Increased SSC and associated deposition	The impacts of increased SSC and associated deposition are expected to be less than, or at most, equal to, the effects described for the construction and decommissioning phase. Sediment disturbance during Offshore Site maintenance activities may result in increased SSC. Annex I Habitat QIs may be directly or indirectly effected by the increased SSCs, such as indirect temporary disturbance or as a result of smothering. Due to the relatively low fines found across the OAA and OECC, only a very small proportion of the total excavated sediment volume will enter suspension and be distributed in a temporary plume over a range of up to 15 km from the ejection point. Increased SSC will be brief (i.e. less than a day), with return to background levels thereafter. Any habitats located in the intertidal marine environment which are subject to varying levels of natural impacts from storms and wave activity, or habitats located in the upper-most level of saltmarshes are unlikely to be affected by increased SSC concentrations (European and Atlantic salt meadows). No impact pathway from SSC to these habitats are therefore predicted. Other habitats may be more susceptible to smothering by sediment and a pathway to LSE can be expected.	Yes
Colonisation of hard structures Removal of hard substrate during decommissioning	The introduction of infrastructure (such as WTG foundations and associated scour/ cable protection) to the marine environment is expected to be colonised by a variety of organisms during the lifetime of the Project. This can result in an increase in local biodiversity and alterations to the prevailing benthic habitats and communities. Decommissioning will be the reverse of the installation process, with WTGs and OSS removed and the seawater de-ballasted from foundations. Structures used for seabed preparation, including stonebeds, will likely be decommissioned in situ. IAC will likely be decommissioned in situ where buried; unburied IAC would be cut and removed. Rock berms will likely remain undisturbed, as this method is likely to result in the lowest environmental impact. As no infrastructure within the Offshore Site will be placed within any of the SACs with benthic QIs, there is no potential pathway for LSE from colonisation and removal of hard substrates and structures.	No
Effect of cable thermal load or Electromagnetic Fields (EMF) on benthic ecology	The IAC and OEC produce EMFs, which have both Electric (E) components, measured in volts per metre, and magnetic components (known as B-fields), measured in Tesla (T). While the direct electric field is encapsulated within the cable structure through electrical insulation and a metallic screen, the B-field is virtually impossible to contain and penetrates most materials. Therefore, B-fields are emitted into the marine environment, with the resultant induced Electric (iE) field, causing a highly localised change in EMFs. Cables used for power transmission create a highly localised change in electric and magnetic fields. The voltage, size, and operational characteristics of IAC and OEC differ from one another and between offshore wind energy project designs, and these all influence the level of additional EMF locally. Effects of EMFs are expected to be highly localised (within meters of the cable). Considering this and the distance of the SAC to the OECC, connectivity is unlikely. Therefore, it is concluded that this impact presents no potential pathway for LSE.	No
Effects of accidental release of pollutants	Impacts are similar or less to the construction phase impacts. Therefore, it is concluded that this impact presents no potential pathway for LSE.	No
Increased risk of introduction and spread of Invasive	There is potential for the increased risk of introduction and spread of INNS as a result of the maintenance activities should further infrastructure, such as cable protection be introduced to the Offshore Site and via vessels during the operational	No

and Non-Native Species (INNS)	and maintenance phases, e.g. through biofouling (e.g. attachment of organisms to boat hulls) or discharge of ballast water. INNS can have a detrimental effect on benthic ecology through predation on existing wildlife or outcompeting for prey and habitat. This can result in biodiversity changes in the existing habitats present in the benthic ecology study area. Depending on the INNS species introduced, this could potentially lead to complete loss of certain species and may result in new habitats forming (e.g. reef-forming species or invasive vegetation). The number of vessels at the Offshore Site during the operational phase is not distinguishable from the current baseline vessel traffic, and as such the introduction of INNS during the operational life of the Project is unlikely. Any maintenance activities are likely to be short-term in duration and only carried out as and when required. Although the introduction of INNS may occur during maintenance operations, it is very unlikely. Therefore, it is concluded that this impact presents no potential pathway for LSE.	

Due to the SACs being within the connectivity range for increased SSC concentrations and deposition, it is concluded that the Offshore Site can have LSE on the SACs listed in Table 3-3.

Table 3-3 European Sites with LSE on Annex I habitat QI as a result of the Offshore Site activities

European Site	QI
Kilkieran Bay and Islands SAC Inishmore Island SAC Inishmaan Island SAC Carrowmore Point to Spanish Point and Islands SAC Carrowmore Dunes SAC Connemara Bog Complex SAC Kilkee Reefs SAC Slyne Head Peninsula SAC	Reefs
Kilkieran Bay and Islands SAC	Mudflats and sandflats not covered by seawater at low tide
Kilkieran Bay and Islands SAC Inishmore Island SAC Carrowmore Point to Spanish Point and Islands SAC Connemara Bog Complex SAC Slyne Head Peninsula SAC	Coastal Lagoons
Kilkieran Bay and Islands SAC Kilkee Reefs SAC Slyne Head Peninsula SAC	Large shallow inlets and bays
Kilkieran Bay and Islands SAC Slyne Head Peninsula SAC	Atlantic salt meadows
Kilkieran Bay and Islands SAC Slyne Head Peninsula SAC	Mediterranean salt meadows

3.2 European Sites Designated for Diadromous Fish and Freshwater Pearl Mussel – LSE pathways

As presented Table 3-1, the assessment of connectivity resulted in six European sites (SACs) having been considered further due to connectivity. The potential impact pathways that could lead to LSE on the Annex I QI of European Sites have been summarised in Table 3-4.

The potential impact pathways to freshwater pearl mussel are indirect impacts through potential effects on Atlantic salmon. The freshwater pearl mussel attach to the gills of Atlantic salmon during their larval stages and any impact affecting the host salmon can also affect the mussels. No direct effects to freshwater pearl mussel from the Project are anticipated beyond those assessed in the Onshore Appropriate Assessment Screening Report (e.g. impacts on freshwater pearl mussel riverine habitat) (see Appendix 1 of Volume 2).

Table 3-4 Potential impacts pathways on diadromous fish and freshwater pearl mussel QIs from the Offshore Site construction, operation and maintenance and decommissioning phases

Potential effect	Description of potential impact pathways	Pathway to LSE (yes/no)
Construction/decommissioning		
Disturbance or damage to QI due to underwater noise generated from construction activities	Underwater noise disturbance to sensitive fish populations generated during construction, including disturbance to migratory fish and spawning fish species. The scale of these effects may depend on the construction methods required. Diadromous fish species are considered to have a low hearing sensitivity given that the swim bladder is not involved in hearing, and they rely on particle motion detection rather than sound pressure. This applies to Atlantic salmon which have a swim bladder but lack the connection to the internal ear as well as lamprey spp. which lack a swim bladder altogether. The Project activities which have the greatest potential to generate noise include UXO clearance, continuous noise from vessels and noise generated during cable installation activities. It should be noted that there will be no piling associated with the project. The planned Horizontal Directional Drilling (HDD) installation operations at the Landfall will generate underwater noise that could displace diadromous fish, either commencing or terminating their migration through the marine environment. However, existing studies into the sound profile of HDD operations within shallow, riverine waters concluded that, in the absence of vessel noise, HDD produced a maximum unweighted SPL of 129.5 dB re 1 µPa (Nedwell, Brooker, and Barham, 2012), when drilling below the riverbed. Erbe and McPherson (2017) reported an SPL of 142-145 dB rms re 1 µPa at 1 m, generated by a jack-up drilling rig undertaking geotechnical drilling in shallow water in western Australia. It is assumed that sound from HDD operations would be similar to this geotechnical drilling. At an offshore HDD emergence location, it is most likely that vessel noise would comprise the dominant contribution to the soundscape. The sound pressure levels associated with HDD are not of a level which could introduce a risk of injury or disturbance to diadromous fish and owing to the short term and transient nature of this activity, no impacts from HDD operations on diadromous fish species are anticipated. Clearing of UXOs would result in a momentary (seconds) increase in underwater noise (i.e., sound pressure levels and particle motion). Underwater sound levels will be temporarily elevated, and this may result in injurious or behavioural effects on diadromous fish. The Popper et al. (2014) criteria states that for all fish species, mortality and potential mortal injury is expected to occur between 229 – 234 dB re 1 µPa. The results of the underwater noise modelling indicate that for mortality or potential mortal injury to occur, fish would need to be within 560 – 930 m of a UXO device, assuming the highest charge weight (800 kg). Therefore, only fish in close proximity to the UXO device would be at risk. Furthermore, diadromous fish are deemed to be of low vulnerability and high recoverability when exposed to underwater noise given, they do not possess a swim bladder involved in hearing. However, given the limited data on migration routes for diadromous fish through Irish waters, and the designated sites being located within the 50 km impact range for underwater noise this impact cannot be ruled out. Therefore, it can be concluded that there is a potential pathway for LSE on diadromous fish species and indirect effects on freshwater pearl mussel at this stage.	Yes

	Atlantic salmon is a host species for freshwater pearl mussels during a critical parasitic phase of the mussel's lifecycle, when they live on the gills of Atlantic salmon or sea trout as parasites (NatureScot, 2022b). The freshwater pearl mussel larvae spend less than a year attached to the gills, and then detach and fall onto the riverbed and remain in the river habitat. Therefore, the Offshore Site only has the potential to impact freshwater pearl mussels indirectly through effects on Atlantic salmon.	
Temporary habitat loss or disturbance	During the pre-construction and construction phases of the Offshore Site, temporary habitat loss or disturbance may occur as a result of Landfall installation, seabed preparation activities (UXO clearance, boulder clearance, bedform clearance, seabed drilling / cutting, and pre-lay grapnel runs) and installation of the cables (trenching, laying, burial and protection). Temporary habitat disturbance or loss may affect individuals directly through injury or physical harm and also indirectly through the disturbance potential feeding habitats. The environment associated with the Offshore Site is subject to moderate levels of existing vessel traffic (including passenger, cargo and other vessel activities) and other disturbances, there is the potential for temporary habitat disturbance, change or loss to occur due to activities throughout the construction and decommissioning activities. As such, activities such as those outlined above, could disturb diadromous fish species migrating through the Offshore Site. Therefore, it is concluded that this impact presents a potential pathway for LSE due to proximity of the SACs to the Offshore Site.	Yes
Long-term habitat loss of spawning and nursery grounds due to presence of foundations and cables on the seabed	As the diadromous fish do not use the Offshore Site as a spawning or nursery grounds, this impact does not present a potential pathway to LSE.	No
Effects of increases in SSC and potential sedimentation / smothering during construction activities	Increased sedimentation associated with installation (e.g., jet trenching and dredging) may lead to increases in SSC in the water column and deposition of the material to the seafloor. This has the potential to clog the gills of diadromous fish passing through an area of high sediment concentrations and lead to smothering of sessile species (freshwater pearl mussel). In addition, increased SSC can result in reduced feeding success of visual predators due to decreased visibility, and mortality of eggs and larvae which are intolerant to increased sediment loads. Additionally, the disturbance of sediments during the above activities can result in the potential release of contaminants within the sediment. Any sedimentation events will disperse quickly though the water column. The spatial extent of increased SSC and associated sediment deposition will be within the tidal excursion extent of 15 km from the Offshore Site. Given that diadromous fish species are highly mobile it is anticipated that any Atlantic salmon or lamprey spp. within the vicinity of the sediment plumes will be able to flee the area. Furthermore, any SSC is considered to be highest near the seabed and not in the water columns where the fish swim. Nevertheless, the diadromous fish species may be required to swim through areas of increased SSC, and it is concluded that there is a potential pathway for LSE on Atlantic salmon, freshwater pearl mussel (indirect), sea lamprey and river lamprey.	Yes

Effects of accidental release of pollutants	Accidental releases of pollutants may arise as a result of accidental spills from vessels or other equipment and have detrimental effects on diadromous fish. As the presence of vessels is not expected to be above the existing baseline traffic of vessels in the area, the likelihood of the impact to occur is thus very low. Due to the highly mobile nature of the diadromous species, it is anticipated that any fish will be able to move away from any affected areas. The spawning grounds for the species are located in rivers that would not be within the tidal influence and as such pollutants are unlikely to reach these areas. As diadromous fish may be feeding in the Offshore Site or its vicinity, the potential prey species may be impacted by pollution events. It is therefore concluded that there is a potential pathway for LSE on Atlantic salmon, freshwater pearl mussel (indirect), sea lamprey and river lamprey.	Yes
Operations and maintenance		
Habitat creation and fish aggregation	Artificial structures placed on the seabed (i.e., turbine foundations and/or cable protection) will introduce new structures for habitat creation and create artificial reef effects, with the potential for fish and predator aggregation as an indirect impact. As the diadromous fish may pass through the Offshore Site while migrating, they may be vulnerable to aggregations of predators like seals. It is therefore concluded that there is a potential pathway for LSE on Atlantic salmon, freshwater pearl mussel (indirect), sea lamprey and river lamprey.	Yes
Effects of increases in SSC and potential sedimentation / smothering during operation and maintenance activities	Increased sedimentation associated with cable repair and reburial (e.g., jet trenching) may lead to smothering, reduced visual ability to detect prey or gill clogging of fish migrating through the Offshore Site. Additionally, the disturbance of sediments during the above activities can result in the potential release of contaminants within the sediment. Any sedimentation events will disperse quickly though the water column. The spatial extent of increased SSC and associated sediment deposition will be within the tidal excursion extent of 15 km from the Offshore Site. Given that diadromous fish species are highly mobile it is anticipated that any Atlantic salmon or lamprey spp. within the vicinity of the sediment plumes will be able to flee the area. Furthermore, any SSC is considered to be highest near the seabed and not in the water columns where the fish swim. Nevertheless, the diadromous fish species may be required to swim through areas of increased SSC, and it is concluded that there is a potential pathway for LSE on Atlantic salmon, freshwater pearl mussel (indirect), sea lamprey and river lamprey.	Yes
Effects of electromagnetic fields (EMFs) from subsea cables	The operation of the cables will result in emission of localised EMFs. This could potentially affect the sensory mechanisms of certain diadromous fish species. Diadromous fish are known to be electrosensitive (CMACS, 2003; Hutchison et al., 2021). Contained within the skeletal structure of diadromous fish is magnetically sensitive material which enables them to use EMFs as a navigational tool during migration (Gill and Bartlett, 2010). Consequently, the introduction of anthropogenic EMF into the marine environment has the potential to alter these migratory behaviours, potentially resulting in increased energy expenditure, although the extent of the effect of EMF on migratory species in unclear (Gill and Bartlett, 2010). Atlantic salmon, sea lamprey and river lamprey may pass through the ZoI during migrations. While exact migration pathways are little understood and are likely to be diffuse across the fish and shellfish study area, rivers important to such species are present along the coastline. Due to the lack of evidence on the	Yes

	migratory routes, LSE through this pathway was concluded on precautionary basis.	
Effects of thermal emissions from subsea cables on diadromous fish	Heat dissipated from operational subsea cables may impact sensitive species, but the effects are more likely to be confined to less mobile species. The potential impacts of thermal load on sensitive species will depend on the cable burial and protection methods used. The impact is predicted to be of highly localised spatial extent, long term duration, continuous and reversible upon decommissioning of the Offshore Site. As the diadromous fish are anticipated to migrate through the Offshore Site and swim in the water column, it is not anticipated that this impact presents a pathway to LSE.	No
Barrier effects on migratory fish from the presence of the fixed platforms and associated infrastructure	If fish species display avoidance behaviors as a result of the presence of offshore infrastructure, there is the potential for barrier effects to impact the movement of migratory fish, such as lamprey species and Atlantic salmon that may migrate through the Offshore Site. The assessment for salmonids is also relevant to freshwater pearl mussel who may be indirectly affected by effects on these species. However, the location and design of the Offshore Site and the distance between the site and SACs enables the passage of fish side of the WTGs and is unlikely to present a significant barrier to movement for migratory fish. The main impact from submarine cables is most likely attributed to EMF which are assessed separately. It is therefore not anticipated that this impact presents a pathway to LSE.	No

Due to the proximity of the Offshore Site to these European Sites, there is LSE on the QI and all have been taken forward for further assessment in this NIS. These European sites are summarised in Table 3-5.

Table 3-5 European Sites with LSE on diadromous fish and freshwater pearl mussel QI as a result of the Offshore Site

European Site	QI	Distance to Offshore Site (km)
Connemara Bog Complex SAC	Atlantic salmon	8.26
Lower River Shannon SAC	Atlantic salmon, freshwater pearl mussel, sea lamprey & river lamprey	8.8
Twelve Bens/Garraun Complex SAC	Atlantic salmon & freshwater pearl mussel	20.8
Maumturk Mountains SAC	Atlantic salmon	23.8
Lough Corrib SAC	Atlantic salmon, freshwater pearl mussel & sea lamprey	35.9
Mweelrea/Sheeffry/Erriff Complex SAC	Atlantic salmon & freshwater pearl mussel	36.5

3.3 European Sites Designated for Marine Mammal Features – LSE pathways

As presented in Table 3-1, the assessment of connectivity resulted in 44 European sites (SACs) which have been identified as having potential connectivity to the Offshore Site activities. To determine if the Project is likely to have an LSE on the sites, a further assessment of the QIs and the relevant impact pathways and sources was carried out using best scientific knowledge. The potential marine mammal impact pathways have been summarised in Table 3-6.

Table 3-6 Potential impacts pathways on marine mammal QIs from the Offshore Site construction, operation and maintenance and decommissioning phases

Potential effect	Description of potential impact pathways	Pathway to LSE (Yes/No)
Construction and decommissioning		
Injury and disturbance due to underwater sound emissions associated with construction (including pre-construction)	Underwater sound associated with construction activities (UXO clearance) can have an impact on marine mammal and megafauna receptors, including the risk of injury, and on habitat use and distribution, due to barrier effects and displacement. Evidence suggests that potential impacts include short term or temporary displacement of mammals. The effects of underwater sound on protected species require further consideration and are considered a potential pathway to LSE. No drilling or piling will be carried out during the Offshore Site construction.	Yes
Underwater construction sound effects on the prey species of marine mammals	Underwater sound generated during construction may cause disturbance to fish populations, including disturbance to migratory fish and spawning fish species, which might result in the change of prey availability to marine mammal species. Marine mammal QIs are considered to be highly mobile and wide ranging and considering the availability of foraging habitat for these species, individuals are expected to be able to forage in alternative areas if prey species become unavailable. Marine mammal species considered in this assessment are generalist feeders, therefore can rely on other prey species rather than a single source. Given the adaptability and mobility of marine mammals and megafauna to find alternative prey or locations, it is concluded that there is no potential pathway for LSE for all mammal species.	No
Disturbance due to the physical presence of vessels	During the construction and decommissioning phases, there will be an increase in vessel traffic associated with the Offshore Site, which could result in an increased risk of disturbance from marine sound and barrier effects to marine mammals through avoidance and displacement, as well as potential behavioural changes. It is very difficult to separate disturbance caused by vessel presence from vessel sound as both of these impacts occur simultaneously, and many studies do not differentiate between these two effects (Erbe et al., 2019). As such, vessel sound will be considered with vessel presence. It is concluded that vessel presence presents a pathway to LSE and will be assessed further in the NIS.	Yes

Risk of injury resulting from collision of marine mammals and megafauna with installation/decommissioning vessels	During the construction and decommissioning phases, there will be an increase in vessel traffic associated with the Offshore Site, which could result in an increased risk of injury from collision. The occurrence of vessel collisions is hard to quantify, as these events can be unnoticed or unreported, particularly for smaller marine species (Peltier et al., 2019; Schoeman et al., 2020). Overall, the risk of injury from collision is expected to occur mostly around the OAA and OECC. The sensitivity of marine mammals to vessel collisions will be species dependent. More agile species, such as harbour porpoise, bottlenose dolphin, grey seal, and harbour seal, have been observed to respond to vessel sound, and so will be more likely to detect and respond to nearby vessels and avoid collision (Erbe et al., 2019). Studies on seals show avoidance of vessel traffic without strong displacement effects, tending to remain beyond 20 m from vessels (Anderwald et al., 2013; Onoufriou et al., 2016). Therefore, harbour porpoise, dolphin species, and seal species are assessed to be of low sensitivity. Considering that this effect could lead to injury or mortality of marine mammals but is unlikely to occur, the magnitude of this effect is negligible. It is therefore concluded that there is no potential pathway for LSE for all mammal species from vessel collision.	No
Impacts associated with effects upon marine water quality, particularly due to any disturbed sediments affecting turbidity	Sediment disturbed as a result of the construction activities has the potential to form a plume that would be extremely transient. The effect from increases in SSC from all Offshore Site activities is predicted to be of very local spatial extent, only of short-term in duration (less than 1 day), continuous throughout the duration of the activities but highly reversible, returning to baseline SSCs following cessation of activity, and therefore, is unlikely to materially alter water quality to an extent that would significantly impact marine mammals. The increased SSC can however result in reduced foraging success of visual predators due to decreased visibility. Marine mammal QIs are considered to be highly mobile and wide ranging and considering the availability of foraging habitat for these species, individuals are expected to be able to forage in alternative areas if prey species become unavailable. Due to their high mobility, these marine mammal species are also able to move away from any increased turbidity and are therefore tolerant to increased SSC. Given the adaptability and mobility of marine mammals and megafauna to find alternative prey or locations, it is concluded that there is no potential pathway for LSE for all mammal species.	No
Impacts associated with effects upon marine water quality due to any accidental release of pollutants	Accidental releases of pollutants may arise as a result of accidental spills from vessels or other equipment and have detrimental effects on marine mammals. The effect would be rare, intermittent, and highly unlikely over the construction phase (four years). Due to the high mobility of harbour porpoise, bottlenose dolphin, grey seal, and harbour seal, the species are able to move away from any potential spill sites. The species are also known to utilise wide areas for foraging. Given the adaptability and mobility of marine mammals and megafauna to find alternative prey or locations, it is concluded that there is no potential pathway for LSE for all mammal species.	No
Operation and maintenance		

Risk of injury due to collision of marine megafauna with WTG foundations	During the operation and maintenance phase, there is the potential of an increased risk of injury to marine mammals with WTG foundations within the OAA. The presence of these novel submersed structures may elevate the risk of collision and subsequently, injury or mortality. There is currently no evidence of marine mammal collision with offshore WTG, whether as floating or fixed-bottom infrastructure. Based on this, collision from a stationary foundation is highly unlikely to cause any significant or fatal injury to a marine mammal. As this effect is highly localised to the OAA and very unlikely to occur, with a very low risk of injury from collision, it is concluded that there is no potential pathway for LSE for all mammal species.	No
Disturbance or injury due to WTG operational sound	Underwater sound generated from the moving mechanical parts within the WTG may cause increase in underwater ambient sound levels, resulting in short term or temporary displacement or other behavioural effects on marine mammals. Operational sound is expected to be almost continuous apart from occasional maintenance or shutdowns due to extreme weather. However, in shallow-water environments, the relative sound of the WTG is usually dominated by ambient sound from shipping traffic or storms. When compared to other sources, WTG sound has been found to be significantly less than passing ships (Tougaard et al., 2020) and the overall relative sound from the windfarm, is unlikely to cause any significant disturbance to marine mammals. Underwater sound modelling was undertaken by Subacoustech (2024) to estimate the sound levels generated by operational WTGs and determined the impact range that may injure marine mammals. The modelling showed that marine mammals would need to stay within 10 m of the WTG for 24 h for injury to occur. This is a highly precautionary and unlikely scenario. It is concluded that there is no potential pathway for LSE for all mammal species.	No
Displacement or barrier effects caused by the physical presence of WTG and associated infrastructure	During the operation and maintenance phase, the physical presence of the array infrastructure, including substructures and the foundations, has the potential to cause displacement or barrier effects on marine mammals. The presence of these structures may restrict access to key habitats used by marine mammals and effect movement patterns and/or behaviour of individuals or populations. Displacement refers to the spatial displacement or loss of access to the area occupied by the Project infrastructure during its 38-year operational lifespan. Studies at Dutch offshore wind farms (OWF) recorded increased harbour porpoise activity within the sites, suggesting that they may be attracted to increased food availability and the reduced vessel traffic within the OWF (Lindeboom et al., 2011; Scheidat et al., 2011). However, other studies have shown no effects of OWFs on harbour porpoise abundance throughout the operational phase of an OWF in the Irish Sea (Vallejo et al., 2017). Monitoring studies of OWFs using GBS foundations in the UK show no long-term effect on bottlenose dolphins and demonstrate an increase in harbour porpoise occurrence (Potlock et al., 2023). Other anthropogenic sea floor structures, such as cable routes (and associated cable protection), may also act as artificial reefs and provide habitat connectivity for prey species. Seals have been observed to repetitively forage around anthropogenic structures. Additionally, no significant barrier effects were observed from anthropogenic structures as seals continued to pass by structures during foraging trips (Arnould et al., 2015). Due to this evidence,	No

	the Offshore Site is not considered a barrier or to cause displacement for the marine mammal species. It is concluded that there is no potential pathway for LSE for all mammal species.	
Disturbance due to the physical presence of vessels	During the operation and maintenance phase, there will be periods of increased localised vessel traffic associated with the Offshore Site, which could result in an increased risk disturbance from marine sound and barrier effects to marine mammals and other megafauna through avoidance and displacement, as well as potential behavioural changes. As such vessel sound is included with physical presence as part of the assessment. Increased vessel traffic during operation and maintenance may increase the risk of disturbance to marine mammals. However, the Offshore Site experiences high level of vessel traffic and expected slight increase in traffic due to operation/maintenance (up to three vessels present at a site) will have an imperceptible effect on baseline conditions. It is concluded that there is no potential pathway for LSE for all mammal species.	No
Risk of injury resulting from collision of marine mammals with operation and maintenance vessels	Increased vessel traffic during operation and maintenance may increase collision risk with marine mammals. However, the Offshore Site experiences high level of vessel traffic and expected slight increase in traffic due to operation/maintenance (up to three vessels present at a site) will have an imperceptible effect on baseline conditions. All the marine mammal QIs are agile and able to avoid vessels to prevent collision. It is concluded that there is no potential pathway for LSE for all mammal species.	No
Risk associated with electromagnetic fields (EMFs) emissions associated with subsea cabling	Electrical cables in the marine environment, such as HVAC cables, will generate EMFs, which are comprised of an electric and a magnetic component. This may alter the behaviour and distribution of marine species that can detect them, particularly ones that rely on electric and/or magnetic signals for hunting and navigation (Gill & Desender, 2020). EMFs have both an electric component (E-field, measured in volts per metre (V/m)) and a magnetic component (B-fields, measured in micro Tesla (µT)). Earth has its own natural geomagnetic field (GMF) with associated B and iE-fields, which marine organisms use for orientation, navigation, and prey location (Gill & Desender, 2020). Background GMF levels in the marine environment ranges from 25 to 65 µT (Hutchison et al., 2018). Direct anthropogenic E-fields are blocked by the use of conductive sheathing within the cable, and hence are not further assessed. B-fields extend beyond the cable structure and are emitted into the marine environment, which results in an induced electric (iE)-field when relative motion is present between the B-field and a conductive medium (i.e. sea water passing over the cable). B-fields decay rapidly with distance from the cable, eventually reaching background GMF levels. EMFs emitted by HVAC cables result in a dynamic, low-frequency sinusoidal B-field (Gill & Desender, 2020). Numerical studies show that EMFs decrease with distance from the cable core (Hutchison et al., 2021; Chainho et al., 2021). Cable burial can increase the distance between the EMF source and the receptor, and where burial is not possible, rock placement or other protection can increase the distance. All cables will be either buried to a minimum target burial depth of 1 m or protected to a depth by a cast iron shell (CIS), therefore there will always be a degree of separation from marine mammal receptors and the source of EMF emissions, should any receptor be present directly at the seabed. In addition, design parameters and installation methods will conform to industry standard specifications which includes shielding	No

	technology to reduce the direct emission of EMFs. The EMFs will be highly localised to the vicinity of the cables and the strengths will dissipate quickly with increased distance from the cables. Exposure of marine mammals to EMF is therefore unlikely and the effects are highly localised and unlikely to impact highly mobile species. It is concluded that there is no potential pathway for LSE for all mammal species.	
Impacts associated with effects upon marine water quality due to any accidental release of pollutants	Accidental releases of pollutants may arise as a result of accidental spills from vessels or other equipment and have detrimental effects on marine mammals and megafauna. Accidental release of pollutants can occur from pollutants contained within the WTGs. The accidental release of pollutants is limited to oils and fluids contained within the WTGs. These fluids have the potential to interact with marine mammals and megafauna and may have a detrimental physiological effect. Any spills are however considered rare, intermittent, and highly unlikely over the operational life of the Project. Due to the high mobility of harbour porpoise, bottlenose dolphin, grey seal, and harbour seal, the species are able to move away from any potential spill sites. Given the adaptability and mobility of marine mammals and megafauna to find alternative prey or locations, it is concluded that there is no potential pathway for LSE for all mammal species.	No
Habitat change, including the potential for change in foraging opportunities	The foundation structures of WTGs and the OSS, as well as scour protection and cable protection, will cause long-term habitat changes and loss for prey species of marine mammals. Long-term habitat change will cause changes in prey abundance and distribution, which can affect foraging success and losses in foraging opportunities for marine mammals. The presence of WTGs, the OSS, and scour protection can also generate artificial reef effects, where the presence of infrastructure can function as a fish aggregating device. The infrastructure provides new habitat that can be colonized by biofouling organisms, which in turn attracts higher trophic levels (Degraer et al., 2020). The magnitude of the impact for prey species is considered to be low, but the presence of physical infrastructure can cause displacement and slight loss of habitat. However, there is the potential for habitat creation from reef effects, which can lead to a positive effect on marine mammals. This effect can have both a positive or adverse effect on marine mammals, depending on whether the prey species are able to recover and aggregate around the infrastructure. Considering the small scale of this effect and the available foraging habitat, any impacts are considered negligible. it is concluded that there is no potential pathway for LSE for all mammal species.	No

The impact source with the largest potential impact range on marine mammal QIs was the potential UXO clearance associated with the Offshore Site. UXO clearance may be required prior to construction of the Project, during which an underwater explosion will generate an acoustic pulse of very high peak pressure (an impulsive sound) potentially causing injury (as Permanent Threshold Shift (PTS) onset) or auditory fatigue or disturbance from the repeated focusing of the hearing apparatus on frequencies occurring at the limits of the individual's 'normal' hearing range. Such fatigue may cause a temporary reduction in hearing ability known as a Temporary Threshold Shift (TTS) (Finneran et al., 2005; Popov et al., 2013; Southall et al., 2019). TTS ranges are used as a suitable proxy to assess behavioural disturbance from UXO sound as the sound source is a single impulsive source (Sinclair *et al.,* 2023). Both TTS and PTS have the potential to lead to a LSE on European Sites and due to the larger impact range for TTS, it was considered as the activity against which the likelihood of significant effect for marine mammals should be considered against. All other impact pathways will be considered further in the NIS, should the SAC be screened in.

This section summarises the assessment for injury and disturbance from UXO clearance to marine mammals from all hearing groups as presented in the Underwater Modelling and Assessment report (Appendix 1 of this NIS; Subacoustech, 2024). No UXO clearance is anticipated during the Project, but the modelling has considered a scenario where one high order UXO detonation is required during the Offshore Site construction. The underwater noise modelling carried out used a maximum charge of 800 kg to assess the impact ratios for PTS and TTS for

- High-frequency cetaceans (HF) = bottlenose dolphin;
- Very high frequency cetaceans (VHF) = harbour porpoise; and
- Phocid carnivores in water (PCW) = grey and harbour seal

Sound levels during UXO clearance are affected by multiple factors, including the charge weight (total size of explosive material being detonated), design, age, burial depth etc. The modelling has only considered the charge weight as the variable in its assessment, and no sound mitigation has been included. Should UXO clearance be required, the scenario with the greatest risk for injury would be a high-order detonation, where all explosive materials in the UXO are completely detonated. The modelled maximum largest charge weight for potential UXO items that may be present in the Project area was 800 kg, in addition to a smaller donor charge of 0.5 kg used to initiate the detonation. The maximum PTS and TTS impact ranges for the marine mammal QIs are shown in Table 3-7 and Table 3-8. The DAHG Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters (NPWS, 2014), alongside other guidance such as that from Marine Scotland (2014) recommend using injury and disturbance criteria proposed by Southall et al. (20*19*), which is based on a combination of linear (unweighted) peak sound pressure levels (SPL) and weighted sound exposure levels (SEL). The unweighted SPL (SPLpeak, commonly referred to as Lp,pk) is a measure of sound intensity from a single pulse causing instantaneous effect, while the weighted SEL, (commonly referred to as LE,p), is a metric of the combined total of sound exposure over a standard time period (here 24 h).

Table 3-7 Estimated PTS impact ranges for high order detonation (800 kg charge weight) for relevant marine mammal species using the impulsive, unweighted $L_{p,pk}$ and Weighted $L_{E,p}$ sound criteria from Southall et al. (2019)

Hearing group	Species	Range (km)	
		Unweighted $L_{p,pk}$	Weighted $L_{E,p}$
HF	Bottlenose dolphin	0.84	0.07
VHF	Harbour porpoise	14	1.6
PCW	Harbour seal, grey seal	2.8	2

Table 3-8 Estimated TTS impact ranges for high order detonation (800 kg charge weight) for relevant marine mammal species using the impulsive, unweighted $L_{p,pk}$ and Weighted $L_{E,p}$ sound criteria from Southall et al. (2019)

Hearing group	Species	Range (km)	
		Unweighted $L_{p,pk}$	Weighted $L_{E,p}$
HF	Bottlenose dolphin	1.5	0.62
VHF	Harbour porpoise	26	4.2
PCW	Harbour seal, grey seal	5.3	23

Based on the modelling results, the maximum disturbance (TTS) impact radius for HF bottlenose dolphin is 0.62 km (Weighted $L_{E,p}$) and 1.5 km (Unweighted $L_{p,pk}$), for VHF harbour porpoise 4.2 km (Weighted $L_{E,p}$) and 26 km (Unweighted $L_{p,pk}$) and for PCW seals 5.3 km (Unweighted $L_{p,pk}$) and 23 km (Weighted $L_{E,p}$).

The disturbance from underwater noise is considered to have the greatest potential for LSE of marine mammal QI. The other activities listed in Table 3-6 are likely to be confined to a smaller area closer to the Offshore Site, and the noise levels from other activities are less than that of potential UXO clearance. Based on this, LSE for European Sites with marine mammal interest was identified as follows.

3.3.1 Seals

With respect to underwater noise emissions, harbour seals normally forage within 40 – 50 km around their haul-out sites and breeding grounds (SCOS, 2020). While a 75 km connectivity range for harbour seal SACs was identified, based on the underwater noise modelling results of 23 km TTS range, and the likely confinement of harbours seals to 50 km from the SACs, LSE was only identified for sites within 50 km of the Offshore Site.

Grey seal SACs are principally breeding sites. While the grey seal foraging range is large (up to 200 km), grey seals congregate for pupping and mating and then disperse. Grey seals are at the breeding sites for a relatively short period of the year, do not tend to make long foraging trips while there and then disperse very widely and do not necessarily have any focus on that SAC site for the rest of the year. There is growing evidence that some grey seals can disperse widely, spending a considerable amount of the rest of the year well away from their breeding sites. Therefore, the recommended foraging distance of 20 km from SACs is considered appropriate when considering impact ranges during the breeding season for grey seals. As the underwater noise modelling results indicated that TTS (as a proxy for behavioural disturbance) is possible up to 23 km from the Offshore Site, it is considered that there is potential for LSE for all grey seal SACs within a precautionary 25 km radius from the Offshore Site.

3.3.2 Harbour porpoise

While the ZoI for harbour porpoise is the relevant MU for the species (CIS MU), the underwater noise modelling indicated that the maximum TTS range for the species is 26 km. Considering the large charge of the modelled detonation scenario (800 kg) and that UXO clearance is not anticipated to be required, the ZoI for the species is considered highly precautious. Taking a precautionary approach, LSE for harbour porpoise QIs from underwater noise (considered as the activity with the highest potential impact radius) is considered for sites 100 km from the Offshore Site. Although there is limited information on the movement patterns of harbour porpoise around the CIS MU, in particular with respect to movements of SAC animals in relation to the boundaries of their SACs, there is no evidence that the Offshore Site and surrounding waters represents a significant foraging areas for this species, within the context of the wider CIS MU. Therefore, it is highly unlikely that harbour porpoise associated with SACs in the Irish Sea, Celtic Sea and western English Channel (overlapping with the CIS MU) will experience any effects as a result of the Offshore Site.

3.3.3 Bottlenose dolphin

While the ZoI for bottlenose dolphin encompasses the relevant MUs for the species (West Coast of Ireland MU and Shannon Estuary MU), the underwater noise modelling indicated that the maximum TTS range for the species is 1.5 km as the species is less susceptible to acoustic disturbance. Considering the large charge of the modelled detonation scenario (800 kg) and that UXO clearance is not anticipated to be required, the ZoI for the species is considered highly precautious. Taking a precautionary approach, LSE for bottlenose dolphin QIs from underwater noise (considered as the activity with the highest potential impact radius) is considered for sites 100 km from the Offshore Site. Furthermore, there is no evidence that the Offshore Site and surrounding waters represents a significant foraging area for bottlenose dolphin, within the context of the wider WCI MU.

The 100 km range of LSE resulting from UXO clearance for bottlenose dolphin, harbour porpoise, grey seal and harbour seal is also considered sufficient to account for LSE arising from the other potential impacts listed in Table 3-6.

In conclusion, LSE for the following European Sites is identified and the sites are fully assessed in the NIS.

Table 3-9 European Sites where LSE on marine mammal QI has been identified

SAC	Species	Distance from Offshore Site (km)
Inishmore Island SAC	Harbour porpoise	< 1 (adjacent with no overlap)
Kilkieran Bay and Islands SAC	Harbour porpoise, harbour seal	1.4
Lower River Shannon SAC	Bottlenose dolphin	8.75 (direct distance, at sea connectivity 15+)
Slyne Head Peninsula SAC	Bottlenose dolphin	13.4
Slyne Head Islands SAC	Bottlenose dolphin, grey seal	17.4
West Connacht Coast SAC	Bottlenose dolphin, harbour porpoise	22.7
Inishbofin and Inishshark SAC	Grey seal	38.2
Galway Bay Complex SAC	Harbour seal	43.2
Blasket Islands SAC	Harbour porpoise	90.1
Duvillaun Islands SAC	Bottlenose dolphin	91.5

Notwithstanding the justification for a 100 km range for LSE, all SACs with harbour porpoise QI which overlap with the CIS MU have been carried forward to the NIS, as a result of feedback received by the Project in relation to two Foreshore Licence applications for site investigations in 2023 (FS007161, FS007543). To ensure consistency with this previous approach, the following 34 sites with Annex II marine mammal QIs have also been considered within the NIS:

- Kenmare River SAC (Ireland)
- Hook Head SAC (Ireland)
- Belgica Mound Province SAC (Ireland)
- Roaringwater Bay and Islands SAC (Ireland)
- Gweedore Bay and Islands SAC (Ireland)
- Bunduff Lough and Machair/Trawalua/Mullaghmore SAC (Ireland)
- St John's Point SAC (Ireland)
- Carnsore Point SAC (Ireland)
- Blackwater Bank SAC (Ireland)
- Lough Swilly SAC (Ireland)
- Codling Fault Zone SAC (Ireland)
- Rockabill to Dalkey SAC (Ireland)
- North Channel SAC (UK)
- West Wales Marine / Gorllewin Cymru Foro SAC (UK)
- Bristol Channel Approaches / Dynesfeydd Môr Hafren SAC (UK)
- Mers Celtiques - Talus du golfe de Gascogne SCI (France)
- North Anglesey Marine / Gogledd Môn Foro SAC (UK)
- Lambay Island SAC (Ireland)
- Nord Bretagne DH SAC (France)
- Ouessant-Molène SAC (France)
- Abers - Côte des legends SAC (France)
- Chaussée de Sein SAC (France) (France)
- Côte de Granit rose-Sept-Iles SAC (France)
- Baie de Morlaix SAC (France)
- Côtes de Crozon SAC (France)
- Récifs et landes de la Hague SAC (France)
- Anse de Vauville SAC (France)
- Banc et récifs de Surtainville SAC (France)
- Baie du Mont Saint-Michel SAC (France)
- Estuaire de la Rance SAC (France)
- Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard SAC (France)
- Cap d'Erquy-Cap Fréhel SAC (France)
- Baie de Saint-Brieuc SAC (France)

- Tregor Goëlo Es SAC (France)

3.4 European Sites Designated for Marine Ornithological Features

Table 3-1 lists the SPAs that have been 'Screened in' for connectivity and further assessment in the NIS. The potential impact pathways that could lead to LSE on the QI species for SPAs have been summarised in Table 3-10.

Table 3-10 Potential impact pathways on SPAs for Offshore Ornithology

Potential Effect	Description
Disturbance during construction and decommissioning	Disturbance from presence and movement of vessels during construction/decommissioning activities will be limited in scale, temporary and not significant.
Indirect changes in prey distribution during construction/decommissioning	Indirect impacts on foraging seabirds as a result of changes to prey availability during construction or decommissioning will be limited in scale, temporary and not significant.
Disturbance during O&M	Disturbance to seabirds from presence and movement of maintenance vessels will be limited in scale, temporary and not significant.
Displacement during O&M	If seabirds avoid the all or parts of the OAA due to the presence of turbines, this is considered to be displacement. Species considered at highest risk are auks and divers, with gull species considered to be at low risk.
Barrier effects during O&M	Flying around the OAA (rather than between turbines) is considered a barrier effect which could potentially impact the energy budgets of breeding individuals moving between a colony and a feeding area and having a longer commute as a result.
Collision during O&M	Risk of collision with turbine blades for birds flying through the OAA. Species considered at highest risk are higher flying species such as gannet and gulls, with low-flying species e.g. auks and petrels at low risk. There is also potential for migratory non-seabird species to pass through the OAA during the spring and autumn migration periods.

The impacts on Offshore Ornithology associated with Construction and Decommissioning will be temporary and not significant. Therefore, it is considered that any such temporary impacts will not cause significant impacts on QIs for SPAs.

The QI bird species and relevant SPAs where LSE could not be screened out are summarised in Table 3-11. These species and SPAs are therefore brought forward for Stage 2 assessment.

The potential for LSE on the QIs of SPAs listed in Table 3-11 in the absence of any mitigation, individually or in combination with other plans or projects, was identified in the AASR. Table 3-11 also summarises the Conservation Objectives of each SPA, as well as summarising the potential impact on the QIs.

Table 3-11 SPAs , Conservation Objectives and Qualifying Interest bird species considered for further assessment at Stage 2.

SPA and distance to OAA	Conservation Objectives (NPWS, 2024; JNCC, 2024))	Relevant Qualifying Interest species
Mid-Clare Coast SPA 60.6km	To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA: The favourable conservation status of a species is achieved when: o population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats; o the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future; there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.	Barnacle Goose -
Slyne Head to Ardmore Point Islands SPA 6.7 km	To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA: The favourable conservation status of a species is achieved when: o population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats; o the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future; o there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.	Barnacle Goose, Arctic Tern, Sandwich Tern and Little Tern
Inishmore SPA 16 km	To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA: The favourable conservation status of a species is achieved when: o population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats. o the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future. o there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.	Kittiwake, Arctic Tern, Guillemot and Little Tern
Cruagh Island SPA	To maintain or restore the favourable conservation condition of the bird species listed as Special	Manx Shearwater, Barnacle Goose

SPA and distance to OAA	Conservation Objectives (NPWS, 2024; JNCC, 2024))	Relevant Qualifying Interest species
38.6	Conservation Interests for this SPA: The favourable conservation status of a species is achieved when: ○ population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats. ○ the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future. there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.	
River Shannon and River Fergus Estuaries SPA 104.6km	To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA: The favourable conservation status of a species is achieved when: ○ population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats; ○ the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future; ○ there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.	Whooper Swan, Light-belied Brent Goose
Cliffs of Moher SPA 42.2 km	To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA: The favourable conservation status of a species is achieved when: ○ population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats; ○ the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future; ○ there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.	Fulmar, Kittiwake, Guillemot, Razorbill and Puffin
Illaunonearaun SPA 65.9km	To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA: The favourable conservation status of a species is achieved when:	Barnacle Goose

SPA and distance to OAA	Conservation Objectives (NPWS, 2024; JNCC, 2024))	Relevant Qualifying Interest species
	○ population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats; ○ the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future; ○ there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.	
High Island, Inishshark and Duvillaun SPA 51.1 km	To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA: The favourable conservation status of a species is achieved when: ○ population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats; ○ the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future; ○ there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.	Fulmar, Barnacle Goose and Arctic Tern
Inner Galway Bay SPA 56.5 km	To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA: The favourable conservation status of a species is achieved when: ○ population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats. ○ the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future. ○ there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.	Great Northern Diver, Common Gull, Sandwich Tern, Common Tern and Wildfowl and Waders
Illaunnanoon SPA 50.5km	To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA: The favourable conservation status of a species is achieved when: ○ population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats.	Sandwich Tern

SPA and distance to OAA	Conservation Objectives (NPWS, 2024; JNCC, 2024))	Relevant Qualifying Interest species
	○ the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future. ○ there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.	
Magharee Islands SPA 103.3km	To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA: The favourable conservation status of a species is achieved when: ○ population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats. ○ the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future. ○ there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.	Storm Petrel, Barnacle Goose, Common tern, Artic Tern and Little tern
Clare Island SPA 70.7 km	To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA: The favourable conservation status of a species is achieved when: ○ population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats; ○ the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future; ○ there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.	Fulmar, Kittiwake, Guillemot and Razorbill
Loop Head SPA 74.8 km	To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA: The favourable conservation status of a species is achieved when: ○ population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats; ○ the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future;	Kittiwake, Guillemot

SPA and distance to OAA	Conservation Objectives (NPWS, 2024; JNCC, 2024))	Relevant Qualifying Interest species
	○ there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.	
Bills Rocks SPA 76.0 km	To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA: The favourable conservation status of a species is achieved when: ○ population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats; ○ the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future; ○ there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.	Storm Petrel, Puffin
Dingle Peninsula SPA 119.3km	To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA: The favourable conservation status of a species is achieved when: ○ population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats; ○ the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future; ○ there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.	Fulmar
Duvillaun Islands SPA 104.5km	To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA: The favourable conservation status of a species is achieved when: ○ population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats; ○ the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future; ○ there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.	Fulmar, Storm Petrel and Barnacle Goose

SPA and distance to OAA	Conservation Objectives (NPWS, 2024; JNCC, 2024))	Relevant Qualifying Interest species
Inishglora and Inishkeeragh SPA 117 km	To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA: The favourable conservation status of a species is achieved when: o population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats; o the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future; o there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.	Storm Petrel, Barnacle Goose, Lesser black-backed Gull and Arctic Tern
Blasket Islands SPA 139 km	To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA: The favourable conservation status of a species is achieved when: o population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats; o the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future; o there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.	Fulmar, Manx shearwater, Storm Petrel, Lesser black-backed Gull, Kittiwake, Razorbill and Puffin
Puffin Island SPA 167.5 km	To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA: The favourable conservation status of a species is achieved when: o population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats; o the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future; o there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.	Fulmar, Manx shearwater, Storm Petrel, Lesser black-backed Gull and Puffin
Iveragh Peninsula SPA 171.1 km	To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA:	Fulmar, Kittiwake

SPA and distance to OAA	Conservation Objectives (NPWS, 2024; JNCC, 2024))	Relevant Qualifying Interest species
	The favourable conservation status of a species is achieved when: o population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats; o the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future; o there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.	
Skelligs SPA 176.4 km	To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA: The favourable conservation status of a species is achieved when: o population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats; o the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future; o there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.	Fulmar, Manx shearwater, Storm Petrel, Gannet, Kittiwake and Puffint
Stags of Broad Haven SPA 143.1km	To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA: The favourable conservation status of a species is achieved when: o population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats; o the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future; o there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.	Storm Petrel
Eirk Bog SPA 145km	To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA	Greenland White-fronted Goose
The Gearagh SPA 165km	To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA.	Wigeon, Teal, Mallard, Coot

SPA and distance to OAA	Conservation Objectives (NPWS, 2024; JNCC, 2024))	Relevant Qualifying Interest species
	To maintain or restore the favourable conservation condition of the wetland habitat at The Gearagh SPA as a resource for the regularly occurring migratory waterbirds that utilise it.	
Deenish Island and Scariff Island SPA 190.1 km	To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA: The favourable conservation status of a species is achieved when: o population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats; o the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future; o there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.	Fulmar, Manx shearwater, Storm Petrel, Lesser black-backed Gull
Clonakilty Bay SPA 195 km	To maintain the favourable conservation condition of Shelduck, Dunlin, Black-tailed Godwit and Curlew in Clonakilty Bay SPA in terms of the long term population trend being stable or increasing and no significant decrease in the range, timing or intensity of use of areas by these species	Shelduck, Dunlin, Black-tailed Godwit and Curlew
Illanmaster SPA 226.2km	To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA: The favourable conservation status of a species is achieved when: o population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats; o the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future; o there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.	Storm Petrel
The Bull and The Cow Rocks SPA 192.4 km	To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA: The favourable conservation status of a species is achieved when:	Storm Petrel, Gannet and Puffin

SPA and distance to OAA	Conservation Objectives (NPWS, 2024; JNCC, 2024))	Relevant Qualifying Interest species
	○ population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats; ○ the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future; ○ there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.	
Beara Peninsula SPA 206.1km	To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA: The favourable conservation status of a species is achieved when: ○ population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats; ○ the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future; ○ there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.	Fulmar
Aughris Head SPA 225.7 km	To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA: The favourable conservation status of a species is achieved when: ○ population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats; ○ the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future; ○ there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.	Kittiwake
West Donegal Coast SPA 247.7 km	To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA: The favourable conservation status of a species is achieved when: ○ population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats;	Fulmar, Kittiwake

SPA and distance to OAA	Conservation Objectives (NPWS, 2024; JNCC, 2024))	Relevant Qualifying Interest species
	○ the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future; ○ there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.	
Tory Island SPA 290.4km	To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA: The favourable conservation status of a species is achieved when: ○ population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats; ○ the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future; ○ there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.	Fulmar
Horn Head to Fanad Head SPA 305.6	To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA: The favourable conservation status of a species is achieved when: ○ population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats; ○ the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future; ○ there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.	Fulmar, Barnacle Goose and Greenland white-fronted goose
Saltee Islands SPA 491.9 km	To maintain the favourable conservation condition of Gannet in the Saltee Islands SPA, which is defined by the following list of attributes and targets: ○ Breeding population abundance - No significant decline ○ Productivity rate - No significant decline ○ Distribution: breeding colonies - No significant decline ○ Prey biomass available - No significant decline ○ Barriers to connectivity – No significant increase	Fulmar and Gannet

SPA and distance to OAA	Conservation Objectives (NPWS, 2024; JNCC, 2024))	Relevant Qualifying Interest species
	○ Disturbance at the breeding site - No significant increase ○ Disturbance at marine areas immediately adjacent to the colony - No significant increase	
Mingulay and Berneray SPA 421.4km	To ensure for the qualifying species that the following are maintained in the long term: ○ Population of the species as a viable component of the site ○ Distribution of the species within site ○ Distribution and extent of habitats supporting the species ○ Structure, function and supporting processes of habitats supporting the species ○ No significant disturbance of the species	Fulmar
Skomer, Skokholm and the Seas off Pembrokeshire / Sgomer, Sgogwm a Moroedd Penfro SPA 543.1km	To ensure for the qualifying species that the following are maintained in the long term: ○ The size of the population should be stable or increasing, allowing for natural variability, and sustainable in the long term. ○ The distribution of the population should be being maintained, or where appropriate increasing. ○ There should be sufficient habitat, of sufficient quality, to support the population in the long term. ○ Factors affecting the population or its habitat should be under appropriate control	Manx Shearwater
Rum SPA 511km	Draft Conservation Objectives: 1. To ensure that the qualifying features of Rum SPA are in favourable condition and make an appropriate contribution to achieving Favourable Conservation Status. 2. To ensure that the integrity of Rum SPA is restored in the context of environmental changes by meeting objectives 2a, 2b and 2c for each qualifying feature: 2a. The populations of the qualifying features are viable components of Rum SPA. 2b. The distributions of the qualifying features throughout the site are maintained by avoiding significant disturbance of the species.	Manx Shearwater

SPA and distance to OAA	Conservation Objectives (NPWS, 2024; JNCC, 2024))	Relevant Qualifying Interest species
	2c. The supporting habitats and processes relevant to qualifying features and their prey/food resources are maintained, or where appropriate, restored at Rum SPA	
Seas off St Kilda SPA 577.2km	Draft Conservation Objectives: 1. To ensure that the qualifying features of St Kilda SPA and the Seas off St Kilda SPA are in favourable condition and make an appropriate contribution to achieving Favourable Conservation Status. 2. To ensure that the integrity of St Kilda SPA and the Seas off St Kilda SPA is restored in the context of environmental changes by meeting objectives 2a, 2b and 2c for each qualifying feature: 2a. The populations of qualifying features are viable components of St Kilda SPA and Seas off St Kilda SPA. 2b. The distributions of the qualifying features throughout St Kilda SPA and Seas off St Kilda SPA are maintained by avoiding significant disturbance of the species. 2c. The supporting habitats and processes relevant to qualifying features and their prey/food resources are maintained, or where appropriate restored, at St Kilda SPA and/or Seas off St Kilda	Fulmar
St Kilda SPA 551.7km	Draft Conservation Objectives: 1. To ensure that the qualifying features of St Kilda SPA and the Seas off St Kilda SPA are in favourable condition and make an appropriate contribution to achieving Favourable Conservation Status. 2. To ensure that the integrity of St Kilda SPA and the Seas off St Kilda SPA is restored in the context of environmental changes by meeting objectives 2a, 2b and 2c for each qualifying feature: 2a. The populations of qualifying features are viable components of St Kilda SPA and Seas off St Kilda SPA. 2b. The distributions of the qualifying features throughout St Kilda SPA and Seas off St Kilda SPA	Fulmar and Manx Shearwater

SPA and distance to OAA	Conservation Objectives (NPWS, 2024; JNCC, 2024))	Relevant Qualifying Interest species
	are maintained by avoiding significant disturbance of the species. 2c. The supporting habitats and processes relevant to qualifying features and their prey/food resources are maintained, or where appropriate restored, at St Kilda SPA and/or Seas off St Kilda	
Copeland Islands SPA 535.9km	SPA SELECTION FEATURE OBJECTIVES To maintain or enhance the population of the qualifying species Fledging success sufficient to maintain or enhance population To maintain or enhance the range of habitats utilised by the qualifying species To ensure that the integrity of the site is maintained; To ensure there is no significant disturbance of the species and To ensure that the following are maintained in the long term: ¬ Population of the species as a viable component of the site ¬ Distribution of the species within site ¬ Distribution and extent of habitats supporting the species ¬ Structure, function and supporting processes of habitats supporting the species	Manx Shearwater
Glannau Aberdaron ac Ynys Enlli/ Aberdaron Coast and Bardsey Island SPA 547.4km	For all European Sites outside UK or Irish waters, a precautionary approach has been taken in this assessment and assumed a 'Restore to or maintain favourable conservation status' objective for the QI. The determination will be based upon the conservation objectives of the closest designated site with the same qualifying feature that has conservation objectives within the same MU.	Manx Shearwater
Shiant Isles SPA 599km	To ensure for the qualifying species that the following are maintained in the long term: o Population of the species as a viable component of the site	Fulmar

SPA and distance to OAA	Conservation Objectives (NPWS, 2024; JNCC, 2024))	Relevant Qualifying Interest species
	○ Distribution of the species within site ¾ Distribution and extent of habitats supporting the species ○ Structure, function and supporting processes of habitats supporting the species ○ No significant disturbance of the species	
Flannan Isles SPA 623.4km	To ensure for the qualifying species that the following are maintained in the long term: ○ Population of the species as a viable component of the site ○ Distribution of the species within site ¾ Distribution and extent of habitats supporting the species ○ Structure, function and supporting processes of habitats supporting the species ○ No significant disturbance of the species	Fulmar
Lambay Island SPA 649km	To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA: The favourable conservation status of a species is achieved when: ○ population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats; ○ the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future; ○ there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.	Fulmar
Ouessant-Molène SPA 727km	For all European Sites outside UK or Irish waters, a precautionary approach has been taken in this assessment and assumed a 'Restore to or maintain favourable conservation status' objective for the QI. The determination will be based upon the conservation objectives of the closest designated site with the same qualifying feature that has conservation objectives within the same MU For reference see the Saltee Islands SPA in Ireland for the conservation of objectives of these qualifying interests.	Fulmar and Manx Shearwater
Handa SPA 677.9km	To ensure for the qualifying species that the following are maintained in the long term: ○ Population of the species as a viable component of the site	Fulmar

SPA and distance to OAA	Conservation Objectives (NPWS, 2024; JNCC, 2024))	Relevant Qualifying Interest species
	○ Distribution of the species within site ¾ Distribution and extent of habitats supporting the species ○ Structure, function and supporting processes of habitats supporting the species ○ No significant disturbance of the species	
Cape Wrath SPA 704.5km	To ensure for the qualifying species that the following are maintained in the long term: ○ Population of the species as a viable component of the site ○ Distribution of the species within site ¾ Distribution and extent of habitats supporting the species ○ Structure, function and supporting processes of habitats supporting the species ○ No significant disturbance of the species	Fulmar
Cote de Granit Rose-Sept Iles SPA 779km	For all European Sites outside UK or Irish waters, a precautionary approach has been taken in this assessment and assumed a 'Restore to or maintain favourable conservation status' objective for the QI. The determination will be based upon the conservation objectives of the closest designated site with the same qualifying feature that has conservation objectives within the same MU. For reference see the Saltee Islands SPA in Ireland for the conservation of objectives of these qualifying interests	Fulmar andManx Shearwater
Camaret SPA 701km	For all European Sites outside UK or Irish waters, a precautionary approach has been taken in this assessment and assumed a 'Restore to or maintain favourable conservation status' objective for the QI. The determination will be based upon the conservation objectives of the closest designated site with the same qualifying feature that has conservation objectives within the same MU. For reference see the Saltee Islands SPA in Ireland for the conservation of objectives of these qualifying interests	Fulmar
North Rona and Sula Sgeir SPA 689.1km	To ensure for the qualifying species that the following are maintained in the long term: ○ Population of the species as a viable component of the site ○ Distribution of the species within site ¾ Distribution and extent of habitats supporting the species	Fulmar

SPA and distance to OAA	Conservation Objectives (NPWS, 2024; JNCC, 2024))	Relevant Qualifying Interest species
	○ Structure, function and supporting processes of habitats supporting the species ○ No significant disturbance of the species	
North Caithness Cliffs SPA 771km	To ensure for the qualifying species that the following are maintained in the long term: ○ Population of the species as a viable component of the site ○ Distribution of the species within site ¾ Distribution and extent of habitats supporting the species ○ Structure, function and supporting processes of habitats supporting the species ○ No significant disturbance of the species	Fulmar
Hoy SPA 810.2km	To ensure for the qualifying species that the following are maintained in the long term: ○ Population of the species as a viable component of the site ○ Distribution of the species within site ¾ Distribution and extent of habitats supporting the species ○ Structure, function and supporting processes of habitats supporting the species ○ No significant disturbance of the species	Fulmar
Cap d'Erquy-Cap Fréhel SPA 855km	For all European Sites outside UK or Irish waters, a precautionary approach has been taken in this assessment and assumed a 'Restore to or maintain favourable conservation status' objective for the QI. The determination will be based upon the conservation objectives of the closest designated site with the same qualifying feature that has conservation objectives within the same MU. For reference see the Saltee Islands SPA in Ireland for the conservation of objectives of these qualifying interests	Fulmar
Rousay SPA 859.5km	To ensure for the qualifying species that the following are maintained in the long term: ○ Population of the species as a viable component of the site ○ Distribution of the species within site ¾ Distribution and extent of habitats supporting the species ○ Structure, function and supporting processes of habitats supporting the species ○ No significant disturbance of the species	Fulmar

SPA and distance to OAA	Conservation Objectives (NPWS, 2024; JNCC, 2024))	Relevant Qualifying Interest species
West Westray SPA 864.5km	To ensure for the qualifying species that the following are maintained in the long term: ○ Population of the species as a viable component of the site ○ Distribution of the species within site ¾ Distribution and extent of habitats supporting the species ○ Structure, function and supporting processes of habitats supporting the species ○ No significant disturbance of the species	Fulmar
Copinsay SPA 908.9	To ensure for the qualifying species that the following are maintained in the long term: ○ Population of the species as a viable component of the site ○ Distribution of the species within site ¾ Distribution and extent of habitats supporting the species ○ Structure, function and supporting processes of habitats supporting the species ○ No significant disturbance of the species	Fulmar
East Caithness Cliffs SPA 871.1km	To ensure for the qualifying species that the following are maintained in the long term: ○ Population of the species as a viable component of the site ○ Distribution of the species within site ¾ Distribution and extent of habitats supporting the species ○ Structure, function and supporting processes of habitats supporting the species ○ No significant disturbance of the species	Fulmar
Calf of Eday SPA 869.3km	To ensure for the qualifying species that the following are maintained in the long term: ○ Population of the species as a viable component of the site ○ Distribution of the species within site ¾ Distribution and extent of habitats supporting the species ○ Structure, function and supporting processes of habitats supporting the species ○ No significant disturbance of the species	Fulmar
Iles Houat-Hoedic SPA 879.9km	For all European Sites outside UK or Irish waters, a precautionary approach has been taken in this assessment and assumed a 'Restore to or maintain favourable conservation status' objective for the QI.	Manx Shearwater

SPA and distance to OAA	Conservation Objectives (NPWS, 2024; JNCC, 2024))	Relevant Qualifying Interest species
	The determination will be based upon the conservation objectives of the closest designated site with the same qualifying feature that has conservation objectives within the same MU. For reference see the Saltee Islands SPA in Ireland for the conservation of objectives of these qualifying interests	
Falaise du Bessin Occidental SPA 936.8km	For all European Sites outside UK or Irish waters, a precautionary approach has been taken in this assessment and assumed a 'Restore to or maintain favourable conservation status' objective for the QI. The determination will be based upon the conservation objectives of the closest designated site with the same qualifying feature that has conservation objectives within the same MU. For reference see the Saltee Islands SPA in Ireland for the conservation of objectives of these qualifying interests	Fulmar
Seas off Foula SPA 893.7km	Site conservation objective: To avoid significant deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, subject to natural change, thus ensuring that the integrity of the site is maintained in the long term and makes an appropriate contribution to achieving the aims of the Birds Directive for each of the qualifying species. This contribution would be achieved through delivering the following objectives for each of the sites qualifying features: A. Avoid significant mortality, injury and disturbance of the qualifying features, so that the distribution of the species and ability to use the site are maintained in the long-term; B. Maintain the habitats and food resources of the qualifying features in favourable condition.	Fulmar
Fair Isle SPA 975.9km	To ensure for the qualifying species that the following are maintained in the long term: o Population of the species as a viable component of the site o Distribution of the species within site ¾ Distribution and extent of habitats supporting the species	Fulmar

SPA and distance to OAA	Conservation Objectives (NPWS, 2024; JNCC, 2024))	Relevant Qualifying Interest species
	○ Structure, function and supporting processes of habitats supporting the species ○ No significant disturbance of the species	
Littoral seino-marin SPA 1,030.3km	For all European Sites outside UK or Irish waters, a precautionary approach has been taken in this assessment and assumed a 'Restore to or maintain favourable conservation status' objective for the QI. The determination will be based upon the conservation objectives of the closest designated site with the same qualifying feature that has conservation objectives within the same MU. For reference see the Saltee Islands SPA in Ireland for the conservation of objectives of these qualifying interests	Fulmar
Troup, Pennan and Lion's Heads SPA 1,185.5km	To ensure for the qualifying species that the following are maintained in the long term: ○ Population of the species as a viable component of the site ○ Distribution of the species within site ¾ Distribution and extent of habitats supporting the species ○ Structure, function and supporting processes of habitats supporting the species ○ No significant disturbance of the species	Fulmar
Foula SPA 924.5km	Site conservation objective: To avoid significant deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, subject to natural change, thus ensuring that the integrity of the site is maintained in the long term and makes an appropriate contribution to achieving the aims of the Birds Directive for each of the qualifying species. This contribution would be achieved through delivering the following objectives for each of the sites qualifying features: A. Avoid significant mortality, injury and disturbance of the qualifying features, so that the distribution of the species and ability to use the site are maintained in the long-term; B. Maintain the habitats and food resources of the qualifying features in favourable condition.	Fulmar

SPA and distance to OAA	Conservation Objectives (NPWS, 2024; JNCC, 2024))	Relevant Qualifying Interest species
Sumburgh Head SPA 963.7km	To ensure for the qualifying species that the following are maintained in the long term: o Population of the species as a viable component of the site o Distribution of the species within site ¾ Distribution and extent of habitats supporting the species o Structure, function and supporting processes of habitats supporting the species. o No significant disturbance of the species	Fulmar
Buchan Ness to Collieston Coast SPA 1,032.1km	To ensure for the qualifying species that the following are maintained in the long term: o Population of the species as a viable component of the site o Distribution of the species within site ¾ Distribution and extent of habitats supporting the species o Structure, function and supporting processes of habitats supporting the species. o No significant disturbance of the species	Fulmar
Noss SPA 976.5km	To ensure for the qualifying species that the following are maintained in the long term: o Population of the species as a viable component of the site o Distribution of the species within site ¾ Distribution and extent of habitats supporting the species o Structure, function and supporting processes of habitats supporting the species. o No significant disturbance of the species	Fulmar
Hermaness, Saxa Vord and Valla Field SPA 1,044.5km	To ensure for the qualifying species that the following are maintained in the long term: o Population of the species as a viable component of the site o Distribution of the species within site ¾ Distribution and extent of habitats supporting the species o Structure, function and supporting processes of habitats supporting the species. o No significant disturbance of the species	Fulmar
Fetlar SPA 933km	To ensure for the qualifying species that the following are maintained in the long term: o Population of the species as a viable component of the site	Fulmar

SPA and distance to OAA	Conservation Objectives (NPWS, 2024; JNCC, 2024))	Relevant Qualifying Interest species
	○ Distribution of the species within site ¾ Distribution and extent of habitats supporting the species ○ Structure, function and supporting processes of habitats supporting the species. ○ No significant disturbance of the species	

3.5 Summary of European Sites where LSE was found on SACs

The construction, operation and maintenance and decommissioning of the Offshore Site is likely to have a significant effect on the following SACs due to the LSE on the particular species (Table 3-12).

While all of the SACs and all their QIs and conservation objectives were considered holistically due to potential impacts arising from the Offshore Site, the conclusion of LSE on the sites was not a result of impacts on the other QIs of the sites as listed in Table 3-1. Those QIs are therefore not assessed further in the NIS as there is no LSE and consequently no potential for adverse effect on those QIs. As there is no impact on these receptors, there cannot be additional adverse effects on integrity of the European Sites and only impacts that may affect site integrity are assessed. In adopting this approach which considers receptor groups with reference to the relevant European Sites, rather than on a European Site by site basis, there is no element, impact or adverse effect on the integrity of any European Site, which has not been identified and assessed.

Table 3-12 SAC QI where LSE was identified, and which are considered further in NIS

European Site	QI	Distance to Offshore Site (km) as measured based on the nearest distance to the OAA or OECC	Conservation objectives
Belgica Mound Province SAC	*Phocoena phocoena* (Harbour Porpoise) [1351]	197.9	*As of March 2024 harbour porpoise has been added as a new Qualifying Interest of the Belgica Mound Province SAC. Therefore the current site-specific conservation objectives for the Belgica Mound Province SAC do not include this feature and no conservation objectives are available at the time of writing.*

			In the absence of defined conservation objectives for harbour porpoise for this site, a proxy conservation objective 'to maintain the favourable condition' has been assumed in this assessment. This assumption is based upon the conservation objectives of the closest European Site (Blasket Islands SAC) with the same QI that has established conservation objectives, within the same population community (MU).
Blackwater Bank SAC	*Phocoena phocoena* (Harbour Porpoise) [1351]	227.9	*As of March 2024 harbour porpoise has been added as a new Qualifying Interest of the* Blackwater Bank *SAC. Therefore the current site-specific conservation objectives for the* Blackwater Bank *SAC do not include this feature and no conservation objectives are available at the time of writing.* *In the absence of defined conservation objectives for harbour porpoise for this site, a proxy conservation objective 'to maintain the favourable condition' has been assumed in this assessment. This assumption is based upon the conservation objectives of the closest European Site (Blasket Islands SAC) with the same QI that has established conservation objectives, within the same population community (MU).*
Blasket Islands SAC	*Phocoena phocoena* (Harbour Porpoise) [1351]	90.1	To maintain the favourable conservation condition of Harbour Porpoise in Blasket Islands SAC.
Bristol Channel Approaches / Dynesfeydd Môr Hafren SAC	*Phocoena phocoena* (Harbour Porpoise) [1351]	497.0	To ensure that the integrity of the site is maintained and that it makes the best possible contribution to maintaining

			Favourable Conservation Status (FCS) for harbour porpoise in UK waters.
Bunduff Lough and Machair/ Trawalua/ Mullaghmore SAC	*Phocoena phocoena* (Harbour Porpoise) [1351]	218.1	*As of March 2024 harbour porpoise has been added as a new Qualifying Interest of the* Bunduff Lough and Machair/ Trawalua/ Mullaghmore *SAC. Therefore the current site-specific conservation objectives for the* Bunduff Lough and Machair/ Trawalua/ Mullaghmore *SAC do not include this feature and no conservation objectives are available at the time of writing.* *In the absence of defined conservation objectives for harbour porpoise for this site, a proxy conservation objective 'to maintain the favourable condition' has been assumed in this assessment. This assumption is based upon the conservation objectives of the closest European Site (Blasket Islands SAC) with the same QI that has established conservation objectives, within the same population community (MU).*
Carnsore Point SAC	*Phocoena phocoena* (Harbour Porpoise) [1351]	220.9	*As of March 2024 harbour porpoise has been added as a new Qualifying Interest of the* Carnsore Point *SAC. Therefore the current site-specific conservation objectives for the* Carnsore Point *SAC do not include this feature and no conservation objectives are available at the time of writing.* *In the absence of defined conservation objectives for harbour porpoise for this site, a proxy conservation objective 'to maintain the favourable*

			condition' has been assumed in this assessment. This assumption is based upon the conservation objectives of the closest European Site (Blasket Islands SAC) with the same QI that has established conservation objectives, within the same population community (MU).
Carrowmore Dunes SAC	Reefs [1170]	1.5	To maintain the favourable conservation condition of Reefs in Carrowmore Dunes SAC.
Carrowmore Point to Spanish Point and Islands SAC	Reefs [1170]	1.2	To maintain the favourable conservation condition of Reefs in Carrowmore Point to Spanish Point and Islands SAC.
	Coastal Lagoons [1150]		To restore the favourable conservation condition of Coastal lagoons in Carrowmore Point to Spanish Point and Islands SAC
Codling Fault Zone SAC	*Phocoena phocoena* (Harbour Porpoise) [1351]	267.5	*As of March 2024 harbour porpoise has been added as a new Qualifying Interest of the* Codling Fault Zone *SAC. Therefore the current site-specific conservation objectives for the* Codling Fault Zone *SAC do not include this feature and no conservation objectives are available at the time of writing.* *In the absence of defined conservation objectives for harbour porpoise for this site, a proxy conservation objective 'to maintain the favourable condition' has been assumed in this assessment. This assumption is based upon the conservation objectives of the closest European Site (Blasket Islands SAC) with the same QI that has established conservation objectives, within*

			the same population community (MU).
Connemara Bog Complex SAC	Reefs [1170]	8.3	To maintain the favourable conservation condition of Reefs in Connemara Bog Complex SAC.
	Coastal Lagoons [1150]		To maintain the favourable conservation condition of Coastal lagoons in Connemara Bog Complex SAC
Duvillaun Islands SAC	*Tursiops truncatus* (Common Bottlenose Dolphin) [1349]	91.5	As of March 2024 bottlenose dolphin has been added as a Qualifying Interest to the Duvillaun Islands SAC. Therefore the current site-specific conservation objectives for the Duvillaun Islands SAC which were developed in 2013 do not include this feature and no conservation objectives are available at the time of writing. In the absence of defined conservation objectives for bottlenose dolphin for this site, a proxy conservation objective 'to maintain the favourable condition' has been assumed in this assessment. This assumption is based upon the conservation objectives of the closest European Site West Connacht Coast SAC) with the same QI that has established conservation objectives, within the same population community (MU).
Galway Bay Complex SAC	*Phoca vitulina* (Harbour Seal) [1365]	43.2	To maintain the favourable conservation condition of Harbour Seal in Galway Bay Complex SAC.
Gweedore Bay and Islands SAC	*Phocoena phocoena* (Harbour porpoise) [1351]	214.5	*As of March 2024 harbour porpoise has been added as a new Qualifying Interest of the Gweedore Bay and Islands SAC. Therefore the current site-specific conservation*

			objectives for the Gweedore Bay and Islands SAC do not include this feature and no conservation objectives are available at the time of writing. *In the absence of defined conservation objectives for harbour porpoise for this site, a proxy conservation objective 'to maintain the favourable condition' has been assumed in this assessment. This assumption is based upon the conservation objectives of the closest European Site (Blasket Islands SAC) with the same QI that has established conservation objectives, within the same population community (MU).*
Hook Head SAC	*Phocoena phocoena* (Harbour porpoise) [1351]	189.1	*As of March 2024 harbour porpoise has been added as a new Qualifying Interest of the Hook Head SAC. Therefore the current site-specific conservation objectives for the Hook Head SAC do not include this feature and no conservation objectives are available at the time of writing.* *In the absence of defined conservation objectives for harbour porpoise for this site, a proxy conservation objective 'to maintain the favourable condition' has been assumed in this assessment. This assumption is based upon the conservation objectives of the closest European Site (Blasket Islands SAC) with the same QI that has established conservation objectives, within the same population community (MU).*
Inishmaan Island SAC	Reefs [1170]	13.1	To maintain the favourable conservation condition of Reefs in Inishmaan Island SAC.

Inishmore Island SAC	Reefs [1170]	< 1 (adjacent with no overlap)	To maintain the favourable conservation condition of Reefs in Inishmore Island SAC.
	Coastal Lagoons [1150]		To restore the favourable conservation condition of Coastal lagoons in Inishmore Island SAC.
Kenmare River SAC	*Phocoena phocoena* (Harbour porpoise) [1351]	139.3	*As of March 2024 harbour porpoise has been added as a new Qualifying Interest of the Kenmare River SAC. Therefore the current site-specific conservation objectives for the Kenmare River SAC do not include this feature and no conservation objectives are available at the time of writing.* *In the absence of defined conservation objectives for harbour porpoise for this site, a proxy conservation objective 'to maintain the favourable condition' has been assumed in this assessment. This assumption is based upon the conservation objectives of the closest European Site (Blasket Islands SAC) with the same QI that has established conservation objectives, within the same population community (MU).*
Kilkee Reefs SAC	Reefs [1170]	2.4	To maintain the favourable conservation condition of Reefs in Kilkee Reefs SAC.
	Large shallow inlets and bays [1160]		To maintain the favourable conservation condition of Large shallow inlets and bays in Kilkee Reefs SAC
Kilkieran Bay and Islands SAC	Reefs [1170]	1.5	To maintain the favourable conservation condition of Reefs in Kilkieran Bay and Islands SAC.

	Mudflats and sandflats not covered by seawater at low tide [1140]		To maintain the favourable conservation condition of Mudflats and sandflats not covered by seawater at low tide in Kilkieran Bay and Islands SAC.
	Coastal Lagoons [1150]		To maintain the favourable conservation condition of Coastal lagoons in Kilkieran Bay and Islands SAC.
	Large shallow inlets and bays [1160]		To maintain the favourable conservation condition of Large shallow inlets and bays in Kilkieran Bay and Islands SAC.
	Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330]		To restore the favourable conservation condition of Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) in Kilkieran Bay and Islands SAC.
	Mediterranean salt meadows (*Juncetalia maritimi*) [1410]		To restore the favourable conservation condition of Mediterranean salt meadows (*Juncetalia maritimi*) in Kilkieran Bay and Islands SAC.
	Phocoena phocoena (Harbour Porpoise) [1351]		*As of March 2024 harbour porpoise has been added as a new Qualifying Interest of the Kilkieran Bay and Islands SAC. Therefore the current site-specific conservation objectives for the Kilkieran Bay and Islands SAC which were developed in 2014 do not include this feature and no conservation objectives are available at the time of writing.* *In the absence of defined conservation objectives for harbour porpoise for this site, a proxy conservation objective 'to maintain the favourable condition' has been assumed in*

			this assessment. This assumption is based upon the conservation objectives of the closest European Site (Blasket Islands SAC) with the same QI that has established conservation objectives, within the same population community (MU).
	Phoca vitulina (Harbour Seal) [1365]		To maintain the favourable conservation condition of Harbour Seal in Kilkieran Bay and Islands SAC.
Lambay Island SAC	*Phocoena phocoena* (Harbour porpoise) [1351]	581.3	*As of March 2024 harbour porpoise has been added as a new Qualifying Interest of the Lambay Island SAC. Therefore the current site-specific conservation objectives for the Lambay Island SAC do not include this feature and no conservation objectives are available at the time of writing.* *In the absence of defined conservation objectives for harbour porpoise for this site, a proxy conservation objective 'to maintain the favourable condition' has been assumed in this assessment. This assumption is based upon the conservation objectives of the closest European Site (Blasket Islands SAC) with the same QI that has established conservation objectives, within the same population community (MU).*
Lough Corrib SAC	*Salmo salar* (Salmon) [1106]	35.9	To maintain the favourable conservation condition of Atlantic Salmon in Lough Corrib SAC.
	Margaritifera margaritifera (Freshwater Pearl Mussel) [1029]		To restore the favourable conservation condition of Freshwater Pearl Mussel in Lough Corrib SAC.

	Petromyzon marinus (Sea Lamprey) [1095]		To restore the favourable conservation condition of Sea Lamprey in Lough Corrib SAC.
Lough Swilly SAC	*Phocoena phocoena* (Harbour porpoise) [1351]	235.7	*As of March 2024 harbour porpoise has been added as a new Qualifying Interest of the Lough Swilly SAC. Therefore the current site-specific conservation objectives for the Lough Swilly SAC do not include this feature and no conservation objectives are available at the time of writing.* *In the absence of defined conservation objectives for harbour porpoise for this site, a proxy conservation objective 'to maintain the favourable condition' has been assumed in this assessment. This assumption is based upon the conservation objectives of the closest European Site (Blasket Islands SAC) with the same QI that has established conservation objectives, within the same population community (MU).*
Lower River Shannon SAC	*Salmo salar* (Salmon) [1106] (only in fresh water)	8.8 (direct distance, at-sea 26 km)	To restore the favourable conservation condition of Salmon in the Lower River Shannon SAC.
	Margaritifera margaritifera (Freshwater Pearl Mussel) [1029]		To restore the favourable conservation condition of Freshwater Pearl Mussel in the Lower River Shannon SAC.
	Petromyzon marinus (Sea Lamprey) [1095]		To restore the favourable conservation condition of Sea Lamprey in the Lower River Shannon SAC.
	Lampetra fluviatilis (River Lamprey) [1099]		To maintain the favourable conservation condition of River Lamprey in the Lower River Shannon SAC.

	Tursiops truncatus (Common Bottlenose Dolphin) [1349]		To maintain the favourable conservation condition of Bottlenose Dolphin in the Lower River Shannon SAC.
Maumturk Mountains SAC	*Salmo salar* (Salmon) [1106]	23.8	To maintain the favourable conservation condition of Atlantic Salmon in Maumturk Mountains SAC.
Mweelrea/Sheeffry/Erriff Complex SAC	*Salmo salar* (Salmon) [1106]	36.5	To restore the favourable conservation condition of Atlantic Salmon in Mweelrea/Sheeffry/Erriff Complex SAC.
	Margaritifera margaritifera (Freshwater Pearl Mussel) [1029]		To restore the favourable conservation condition of Freshwater Pearl Mussel in Mweelrea/Sheeffry/Erriff Complex SAC.
North Anglesey Marine / Gogledd Môn Forol SAC	*Phocoena phocoena* (Harbour Porpoise) [1351]	569.2	To avoid deterioration of the habitats of the harbour porpoise or significant disturbance to the harbour porpoise, thus ensuring that the integrity of the site is maintained and the site makes an appropriate contribution to maintaining Favourable Conservation Status (FCS) for the UK harbour porpoise.
North Channel SAC	*Phocoena phocoena* (Harbour Porpoise) [1351]	450.8	To ensure that the integrity of the site is maintained and that it makes the best possible contribution to maintaining Favourable Conservation Status (FCS) for Harbour Porpoise in UK waters.

Roaringwater Bay and Islands SAC	*Phocoena phocoena* (Harbour Porpoise) [1351]	198.3	*As of March 2024 harbour porpoise has been added as a new Qualifying Interest of the Roaringwater Bay and Islands SAC. Therefore the current site-specific conservation objectives for the Roaringwater Bay and Islands SAC do not include this feature and no conservation objectives are available at the time of writing.* *In the absence of defined conservation objectives for harbour porpoise for this site, a proxy conservation objective 'to maintain the favourable condition' has been assumed in this assessment. This assumption is based upon the conservation objectives of the closest European Site (Blasket Islands SAC) with the same QI that has established conservation objectives, within the same population community (MU).*
Rockabill to Dalkey Island SAC	*Phocoena phocoena* (Harbour Porpoise) [1351]	555.3	*As of March 2024 harbour porpoise has been added as a new Qualifying Interest of the Rockabill to Dalkey Island SAC. Therefore the current site-specific conservation objectives for the Rockabill to Dalkey Island SAC do not include this feature and no conservation objectives are available at the time of writing.* *In the absence of defined conservation objectives for harbour porpoise for this site, a proxy conservation objective 'to maintain the favourable condition' has been assumed in this assessment. This assumption is based upon the conservation objectives of the*

			closest European Site (Blasket Islands SAC) with the same QI that has established conservation objectives, within the same population community (MU).
Slyne Head Islands SAC	*Tursiops truncatus* (Common Bottlenose Dolphin) [1349]	17.4	As of March 2024 bottlenose dolphin has been added as a Qualifying Interest to the Slyne Head Islands SAC. Therefore the current site-specific conservation objectives for the Slyne Head Islands SAC which were developed in 2012 do not include this feature and no conservation objectives are available at the time of writing. In the absence of defined conservation objectives for bottlenose dolphin for this site, a proxy conservation objective 'to maintain the favourable condition' has been assumed in this assessment. This assumption is based upon the conservation objectives of the closest European Site (West Connacht Coast SAC) with the same QI that has established conservation objectives, within the same population community (MU).
	Halichoerus grypus (Grey Seal) [1364]		To maintain the favourable conservation condition of Grey Seal in Slyne Head Islands SAC.
Slyne Head Peninsula SAC	Reefs [1170]	13.9	To maintain the favourable conservation condition of Reefs in Slyne Head Peninsula SAC.
	Coastal Lagoons [1150]		To restore the favourable conservation condition of Coastal lagoons in Slyne Head Peninsula SAC.

	Large shallow inlets and bays [1160]		To maintain the favourable conservation condition of Large shallow inlets and bays in Slyne Head Peninsula SAC.
	Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330]		To restore the favourable conservation condition of Atlantic salt meadows (GlaucoPuccinellietalia maritimae) in Slyne Head Peninsula SAC.
	Mediterranean salt meadows (Juncetalia maritimi) [1410]		To restore the favourable conservation condition of Mediterranean salt meadows (Juncetalia maritimi) in Slyne Head Peninsula SAC.
	Tursiops truncatus (Common Bottlenose Dolphin) [1349]		As of March 2024 bottlenose dolphin has been added as a Qualifying Interest to the Slyne Head Peninsula SAC. Therefore the current site-specific conservation objectives for the Slyne Head Peninsula SAC which were developed in 2015 do not include this feature and no conservation objectives are available at the time of writing. In the absence of defined conservation objectives for bottlenose dolphin for this site, a proxy conservation objective 'to maintain the favourable condition' has been assumed in this assessment. This assumption is based upon the conservation objectives of the closest European Site (Lower River Shannon SAC) with the same QI that has established conservation objectives, within the same population community (MU).
St John's Point SAC	*Tursiops truncatus* (Common Bottlenose Dolphin) [1349]	219.2	*As of March 2024 bottlenose dolphin has been added as a new Qualifying Interest of the St John's Point SAC. Therefore*

			the current site-specific conservation objectives for the St John's Point SAC do not include this feature and no conservation objectives are available at the time of writing. *In the absence of defined conservation objectives for bottlenose dolphin for this site, a proxy conservation objective 'to maintain the favourable condition' has been assumed in this assessment. This assumption is based upon the conservation objectives of the closest European Site (West Connaught Coast SAC) with the same QI that has established conservation objectives, within the same population community (MU).*
Twelve Bens/Garraun Complex SAC	*Salmo salar* (Salmon) [1106]	20.8	To maintain the favourable conservation condition of Atlantic Salmon in The Twelve Bens/Garraun Complex SAC.
	Margaritifera margaritifera (Freshwater Pearl Mussel) [1029]		To restore the favourable conservation condition of Freshwater Pearl Mussel in The Twelve Bens/Garraun Complex SAC.
West Connacht Coast SAC	*Tursiops truncatus* (Common Bottlenose Dolphin) [1349]	22.7	To maintain the favourable conservation condition of Common Bottlenose Dolphin in West Connacht Coast SAC.
	Phocoena phocoena (Harbour Porpoise) [1351]		*As of March 2024 harbour porpoise has been added as a new Qualifying Interest of the West Connacht Coast SAC. Therefore the current site-specific conservation objectives for the West Connacht Coast SAC which were developed in 2015 do not include this feature and no conservation objectives are available at the time of writing.*

			In the absence of defined conservation objectives for harbour porpoise for this site, a proxy conservation objective 'to maintain the favourable condition' has been assumed in this assessment. This assumption is based upon the conservation objectives of the closest European Site (Blasket Islands SAC) with the same QI that has established conservation objectives, within the same population community (MU).
West Wales Marine / Gorllewin Cymru Forol SAC	*Phocoena phocoena* (Harbour Porpoise) [1351]	472.9	To ensure that the integrity of the site is maintained and that it makes the best possible contribution to maintaining Favourable Conservation Status (FCS) for harbour porpoise in UK waters.
<u>SACs in French waters</u>: Nord Bretagne DH SAC Ouessant-Molène SAC Abers -Côte des legends SAC Chaussée de Sein SAC Côte de Granit rose-Sept-Iles SAC Baie de Morlaix SAC Côtes de Crozon SAC Récifs et landes de la Hague SAC Anse de Vauville SAC Banc et récifs de Surtainville SAC Baie du Mont Saint-Michel SAC	*Phocoena phocoena* (Harbour Porpoise) [1351]	>600 km from the Offshore Site	For all European Sites outside UK or Irish waters for which harbour porpoise is a QI, a precautionary approach has been taken in this assessment and assumed a 'Restore to or maintain favourable conservation status' objective for the QI. The determination will be based upon the conservation objectives of the closest designated site with the same qualifying feature that has conservation objectives within the same MU. For reference see Blasket Islands SAC in Ireland for the conservation of objectives of these qualifying interests.

Estuaire de la Rance SAC Baie de Lancieux SAC, Baie de l'Arguenon SAC, Archipel de Saint Malo et Dinard SAC Cap d'Erquy-Cap Fréhel SAC Baie de Saint-Brieuc SAC Tregor Goëlo Es SAC			

3.6 Potential Impact Pathways for SACs

3.6.1 Annex I Habitats

All potential pathways on Annex I Habitat QIs were assessed in Table 3-2, and only increased SSC and associated deposition during all project phases and increased risk of introduction and spread of INNS during the construction phase were identified as potential sources of LSE. These impacts are fully assessed in this volume of the NIS. Other pathways are not considered to lead to LSE and are not assessed further in this volume of the NIS.

3.6.2 Diadromous fish and freshwater pearl mussel

All potential pathways to LSE on diadromous fish and freshwater pearl mussel QIs were assessed Table 3-4. The following activities were considered to have the potential to lead to LSE on the diadromous fish and associated freshwater pearl mussel QIs: disturbance or damage to QI due to underwater noise generated from construction activities, temporary habitat loss or disturbance (associated with prey species of diadromous fish), effects of increases in SSC and potential sedimentation / smothering during construction, operational and maintenance and decommissioning phases, effects of accidental release of pollutants during construction, habitat creation and fish aggregation during operational phase and effects of electromagnetic fields (EMFs) from subsea cables during the operational phase. These impacts are fully assessed in this NIS.

3.6.3 Marine mammals

All potential pathways to LSE on marine mammal QIs were assessed in Table 3-6. The following activities were considered to have the potential to lead to LSE on the marine mammal QIs: disturbance or injury to QI due to underwater noise generated from construction activities and disturbance due to physical presence of vessels during construction. These impacts are fully assessed in this NIS.

3.7 Potential Impact Pathways for SPAs

All potential pathways to LSE on SPAs s were assessed as part of the Appropriate Assessment Screening Report. (Appendix 1) The following activities were considered to have the potential to lead to LSE on SPAs: collision impacts during the operation and maintenance phase; and displacement impacts during the operation and maintenance phase. These impacts are fully assessed in this NIS. While all of the SPAs and all their QIs and conservation objectives were considered holistically for potential impacts arising from the Offshore Site, the conclusion of potential LSE on SPAs was based on potential effects on QIs within the defined ZOIs e.g. within mean maximum foraging range, as listed in Table 3-1. Any QIs outside the defined ZOIs were not assessed further in the NIS as there can be no LSE and consequently no potential for adverse effects on those QIs. As there is no effect on these QIs, there cannot be additional adverse effects on the integrity of the European Sites and only effects that may impact site integrity are assessed.

4. STAGE 2 – NATURA IMPACT STATEMENT (NIS)

This section of the NIS provides further assessment to inform Stage 2 of the Appropriate Assessment process and further assesses the European sites whereby LSE was concluded in Stage 1 - Appropriate Assessment Screening. The assessment only includes consideration of the LSE pathways identified in Section 3 where potential connectivity can arise. The assessment considers the potential adverse effect on integrity of the European Sites in view of the site's conservation objectives for the Project alone and in combination with other plans and projects. All conservation objectives which are available have been considered, and where no CO for QIs are available, a proxy CO has been used. which based on our expert view is analogous to the European sites . The CO used in these cases is based upon the conservation objectives of the closest designated site with the same qualifying feature that has conservation objectives within the same MU. For all European Sites outside UK or Irish waters, a precautionary approach has been taken in this assessment and assumed a 'Restore to or maintain favourable conservation status' objective for the QI. The determination will be based upon the conservation objectives of the closest designated site with the same qualifying feature that has conservation objectives within the same MU.

Stage 2 provides an assessment of whether the Project, in light of best scientific knowledge, would adversely affect the integrity of a European Site, considering the conservation objectives of the site.

Due to multiple SACs having the same QIs with similar impact pathways, the QIs are assessed together in the sections below. This allows for a consolidated assessment of similar impact pathways to be carried out while considering the site-specific conservation objectives of the QI. In adopting this approach which considers receptor groups with reference to the relevant European Sites, rather than on a European Site by site basis, there is no element, impact or adverse effect on the integrity of any European Site, which has not been identified and assessed.

4.1 Assessment of SACs

4.1.1 Annex I Habitats

The assessment of the impacts of the Offshore Site construction, operation and maintenance and decommissioning on Annex I Habitat (benthic) QIs of European Sites is provided below. Each impact pathway has been assessed and any mitigation required to conclude no adverse effect on site integrity for the Project alone, and in combination with other plans and projects, has been provided. The in-combination assessment considers the potential impacts of the Offshore Site in combination with plans and projects that have been identified in the benthic ZoI. These plans and projects can be found in Table 4-1.

4.1.1.1 Increased Suspended Sediment Concentration (SSC) and associated deposition (including mobilisation of potential contaminants)

A ZoI of 15 km from source has been derived as the area over which effects on marine physical processes may occur. This buffer is considered appropriate in order to capture the effects associated with pathways for tidal advection of sediment plumes from seabed disturbance activities (e.g. cable trenching), which may have implications on benthic ecology receptors due to sedimentation processes. While the Offshore Site does not directly overlap with any European site (e.g. SACs), there are a number of European sites within the 15 km buffer, including the Inishmore Island SAC (< 1 km, adjacent with no overlap), Carrowmore Point to Spanish Point and Islands SAC (1.2 km), Carrowmore Dunes SAC (1.5 km), Kilkieran Bay and Islands SAC (1.5 km), Kilkee Reefs SAC (2.4 km), Connemara Bog Complex SAC (8.3 km), Inishmaan Island SAC (13.1 km) and Slyne Head Peninsula SAC (13.9 km).

Increased SSC and associate deposition will occur as a result of seabed clearance and deposition in the OAA (via Trailer Suction Hopper Dredge (TSHD) and discrete areas of Controlled Flow Excavator (CFE) with sediment resuspension and settlement in areas adjacent to the dredge locations). It should be noted that the dredge areas are located in a region of sediment to avoid deposition on sensitive habitats (e.g. rocky substrata). Additionally, increased SSC and associated deposition will occur as a result of cable trenching activities via CFE. Finally, there will be sediment disturbance and deposition at the nearshore trenchless technology location (exit pit and berm).

Increased SSC and associated deposition has the potential to result in mobilisation of sediment contaminants; however, a site-specific contaminants analysis has been undertaken and concluded that overall there is considered to be a low to very low likelihood of contaminants across the Offshore Site.

Overall, the following has been assumed:

- For seabed clearance in OAA significant smothering of up to 1.5 m across an area of 0.1 km2 using TSHD);
- For trenching of the OEC, smothering of up to 0.2 m may occur up to an area of 0.09 km2; and
- The excavation and deposition of HDD exit pit is predicted to affect a total area of 0.0016 km2.

Based on the assumptions above, there will be up to 0.35 km^2 of seabed affected by deposition with a minimum burial of 0.2 m.

Overall, the described increase in SSC and resulting plume would be near bed and with increasing distance and duration from the release, dilution would occur resulting in further reduction of the SSC to hundreds and tens of mg/l. By the estimated plume excursion extent, SSC would be at background levels. Furthermore, any deposition fine sediment fraction will become readily incorporated into the surrounding seabed and consequently will become part of the sediment transport regime. This process will redistribute sediments throughout the Offshore Site area and beyond, which would occur regardless of deposition induced by construction activities. For sediment deposition, as discussed above the dredging activities will result in direct deposits of sediment on the seabed.

Overall, there is anticipated to be an imperceptible effect on the nearby SACs with protected benthic Annex I habitats as the QI. On this basis, there is **no adverse effect on the integrity of Kilkieran Bay and Islands SAC, Inishmaan Island SAC, Inishmore Island SAC, Carrowmore Point to Spanish Point and Islands SAC, Carrowmore Dunes SAC, Kilkee Reefs SAC, Connemara Bog Complex SAC and the Slyne Head Peninsula SAC** from increased SSC and associated deposition (including mobilisation of potential contaminants) from the Project alone. No mitigation is required.

4.1.1.2 Increased risk of introduction and spread of INNS during construction

There is potential for the increased risk of introduction and spread of INNS as a result of seabed preparation and construction activities. Pathways of impact during the other Project phases was not considered further as vessel activity return to background levels following completion of construction and any maintenance activities are likely to be short-term in duration and only carried out as and when required. It is unlikely that any additional stonebeds will be required once the foundations have been laid. Although the introduction of INNS may occur during maintenance operations, it is very unlikely and short lived and as such is not considered further.

Marine INNS may be introduced or transferred by vessels, such as through biofouling (e.g. attachment of organisms to boat hulls) or discharge of ballast water. INNS may also be introduced through towing of infrastructure to the site, such as with the temporary anchorage. INNS can have a detrimental effect on benthic ecology through predation on existing wildlife or outcompeting for prey and habitat. This can result in biodiversity changes in the existing habitats present in vicinity of the Offshore Site. Depending on the INNS species introduced, this could potentially lead to complete loss of certain species and may result in new habitats forming (e.g. reef-forming species).

Two non-native taxa were identified during the benthic survey: the polychaete *Goniadella gracilis* and the amphipod *Monocorophium sextonae*. The polychaete *G. gracilis* was observed 42 times in low abundance (≤ 3 individuals) in ~45% of the grab samples across 17 stations in the OAA. Both *G. gracilis* (one station, nine individuals) and M*. sextonae* (three stations, six individuals) were observed along the OECC. Additional taxa recorded within the sediment eDNA samples include two INNS Japanese seaweeds: *Fibrocapsa japonica*, and *Dasysiphonia japonica.*

The vessel requirements will be determined by the installation contractor post-consent, and this will depend on vessel availability. The anticipated number of vessels is 21. The construction vessels will include vessels such as construction laying vessels, trenching support vessels, wind turbine installation vessel (i.e. jack up vessel), tug boats (main tug, assist tug, infield tug), fallpipe vessel, heavy lift vessel, crew transfer vessel, rock laying vessel, TSHD, dynamic positioning vessel, service operations vessel and survey vessel. All vessels are required to adhere to international guidelines (e.g. International Maritime Organization (IMO) International Convention for the Control and Management of Ships' Ballast Water and Sediments ('BWM Convention')). This is captured in the production and implementation of the Offshore Environmental Management Plan. Another vector for the transportation of INNS to the offshore site is from the GBS which will have been temporarily anchored in a floating configuration, potentially in the Shannon Estuary prior to being towed to site. As harbours are known to potentially be prone to invasive species there is a residual risk that such species may attach to the GBS and thus be relocated to the offshore site.

Kelly et al., (2013) provided a risk analysis for INNS in Ireland and Northern Ireland, in which the authors identified high risk species based on recorded species and potential species. The high-risk marine INNS which have been recorded in Ireland include the carpet sea squirt (*Didemnum vexillum*), the slipper limpet (*Crepidula fornicate*), the leathery sea squirt (*Styela clava*). As per the benthic survey results, these species have not been identified as present within the survey area.

While none of the SACs with benthic QI are located within the Offshore Site, it is possible that INNS are introduced to the wider environment through construction vessel ballast or suspended sediment dispersal. INNS may also shed to the wider area during the towing of infrastructure and Project components to the Offshore Site. Therefore the locations of benthic QIs within SACs is not particularly important as the INNS may be dispersed widely within the water column and vessel routes.

4.1.1.2.1 Reefs

The European Sites with reef QI which overlap with the 15 km benthic Zone of Influence include Kilkieran Bay and Islands SAC (1.4 km away), Inishmaan Island SAC (13.1 km away), Inishmore Island SAC (< 1 km away, adjacent with no overlap), the Carrowmore Point to Spanish Point and Islands SAC (1.2 km away), Carrowmore Dunes SAC (1.5 km away), Kilkee Reefs SAC (2.4 km away), Connemara Bog Complex SAC (8.3 km away) and the Slyne Head Peninsula SAC (13.9 km away).

The carpet sea squirt and leathery sea squirt are a species of colonial sea squirt, which are native to Asia and can outcompete and smother native biological communities on rocky substrates. This species can form extensive mats over the substrata it colonises, binding boulders and cobbles and altering the host habitat (Griffith et al., 2009). Therefore, the carpet sea squirt and leathery sea squirt are expected to pose the greatest threat to reef biodiversity and reef QI. In contrast, the non-native taxa identified within the Offshore Site (*G. gracilis* and *M. sextonae*) do not pose a threat to reef biodiversity.

Increased risk of introduction and spread of INNS through construction activities will have a potential adverse effect on stony and bedrock reef. Increased risk of introduction and spread of INNS will result from construction activities throughout the Offshore Site, including through vessels (biofouling and discharge of ballast water) as well as towing infrastructure to the site. Activities will be short-term in duration (i.e. four months pre-construction activities and 18-months construction activities). The potential increased risk of introduction and spread of INNS will cease following the completion of construction activities. Nevertheless, given the potential consequences of the introduction of INNS, the magnitude of effect is therefore medium prior to mitigation and could lead to adverse effect of site integrity. Overall, stony and bedrock reef are considered to be of medium sensitivity to introduction of INNS.

4.1.1.2.2 *Mudflats and sandflats not covered by seawater at low tide*

The European Site with mudflats and sandflats not covered by seawater at low tide QI which overlap with the 15 km benthic Zone of Influence include Kilkieran Bay and Islands SAC (1.4 km away).

Mudflats and sandflats not covered by seawater at low tide are a widespread habitat type throughout the coasts of Atlantic Europe. As established for the reef QI above, the high-risk marine INNS which have been recorded in Ireland include the carpet sea squirt, slipper limpet and leathery sea squirt (Kelly et al., 2013). However, these species are more associated with rocky substrates and coarse sediments. Therefore, it is expected that the muddy and sandy habitats are less susceptible to these problematic invasive species. Increased risk of introduction and spread of INNS will have a likely, short-term adverse effect on sandy and muddy sediments. Increased risk of introduction and spread of INNS will result from construction activities throughout the Offshore Site, including through vessels (biofouling and discharge of ballast water) as well as towing infrastructure to the site. Activities will be short-term in duration (i.e. four months pre-construction activities and 18-months construction activities). The potential increased risk of introduction and spread of INNS will cease following the completion of construction activities.

Nevertheless, given the potential consequences of the introduction of INNS, the magnitude of effect is therefore medium prior to mitigation. While muddy and sandy habitats are noy particularly sensitive to the introduction of INNS (De-Bastos, 2016), it is acknowledged that the slipper limpet can be found in soft sediments. Therefore, muddy and sandy habitats are assessed as medium sensitivity to INNS. Given the assessment of sensitivity and magnitude as described above, the increased risk of introduction and spread of INNS during construction will have a slight, negative effect on subtidal muds and is not significant. Mitigation will also be employed to prevent the introduction and spread of marine INNS. On this basis, there is no adverse effect on integrity of Kilkieran Bay and Islands SAC.

4.1.1.2.3 *Coastal lagoons*

Coastal lagoons are an Annex I protected habitat, which are areas of shallow, coastal salt water, which can be wholly or partially separated from the sea by shingles, sandbanks, or rocks. Coastal lagoons can be characterised by five main subtypes: isolated lagoons, percolation lagoons, silled lagoons, sluiced lagoons, and lagoonal inlets. Marine vegetation that grows within coastal lagoons can vary from beds of common eelgrass (*Zostera marina*), sugar kelp (*Laminaria saccharina*) and tasselweed (*Ruppia* spp.) to pondweeds (*Potamogeton* spp.,) or stoneworts. Fauna within coastal lagoons is often characterised by small crustaceans, burrowing worms and gastropod molluscs.

There is potential for the increased risk of introduction and spread of INNS as a result of seabed preparation and construction activities. Marine INNS may be introduced or transferred by vessels, such as through biofouling (e.g. attachment of organisms to boat hulls) or discharge of ballast water. INNS may also be introduced through towing of infrastructure to the site. INNS can have a detrimental effect on benthic ecology through predation on existing wildlife or outcompeting for prey and habitat. This can result in biodiversity changes in the existing habitats present in the benthic ecology study area.

Depending on the INNS species introduced, this could potentially lead to complete loss of certain species and may result in new habitats forming (e.g. reef-forming species and invasive vegetation).

As above, the high-risk marine INNS which have been recorded in Ireland include the carpet sea squirt (*Didemnum vexillum*), the slipper limpet (*Crepidula fornicate*), the leathery sea squirt (*Styela clava*). The carpet sea squirt and leathery sea squirt are a species of colonial sea squirt, which are native to Asia and can outcompete and smother native biological communities on rocky substrates. This species can form extensive mats over the substrata it colonises, binding boulders and cobbles and altering the host habitat (Griffith et al., 2009). There is a lack of evidence to assess the resistance, resilience and sensitivity of coastal lagoons to impacts arising from the increased risk of introduction and spread of INNS. It is however assumed that due to the mixed substrates and benthic assemblages found in coastal lagoons, the impacts would be similar to those of mudflats and sandflats not covered by seawater at low tide.

4.1.1.2.4 Large shallow inlets and bays

Large shallow inlets and bays are a type of habitat complex which comprise an interdependent plethora of subtidal and intertidal habitats and are generally more sheltered from wave action than the open coast. Large shallow inlets and bays are known to support kelp beds, communities of ephemeral algae and maerl, common eelgrass, and, where located on more wave exposed coasts, soft corals, anemones sponges, sea fans and feather stars.

There is potential for the increased risk of introduction and spread of INNS as a result of seabed preparation and construction activities. Marine INNS may be introduced or transferred by vessels, such as through biofouling (e.g. attachment of organisms to boat hulls) or discharge of ballast water. INNS may also be introduced through towing of infrastructure to the site. INNS can have a detrimental effect on benthic ecology through predation on existing wildlife or outcompeting for prey and habitat. This can result in biodiversity changes in the existing habitats present in the benthic ecology study area. Depending on the INNS species introduced, this could potentially lead to complete loss of certain species and may result in new habitats forming (e.g. reef-forming species and invasive vegetation).

As above, the high-risk marine INNS which have been recorded in Ireland include the carpet sea squirt (*Didemnum vexillum*), the slipper limpet (*Crepidula fornicate*), the leathery sea squirt (*Styela clava*). The carpet sea squirt and leathery sea squirt are a species of colonial sea squirt, which are native to Asia and can outcompete and smother native biological communities on rocky substrates. This species can form extensive mats over the substrata it colonises, binding boulders and cobbles and altering the host habitat (Griffith et al., 2009). There is a lack of evidence to assess the resistance, resilience and sensitivity of large shallow inlets and bays to impacts arising from the increased risk of introduction and spread of INNS. It is however assumed that due to the mixed substrates and benthic assemblages found in shallow inlets and bays, the impacts would be similar to those of mudflats and sandflats not covered by seawater at low tide.

4.1.1.2.5 Atlantic salt meadows

The Offshore Site does not directly overlap any SACs; however, the Kilkieran Bay and Islands SAC (1.4 km away) and Slyne Head Peninsula SAC (13.9 km away) with Atlantic salt meadow QI are located within the 15km Zone of Influence and may potentially be affected by increased risk of introduction and spread of INNS. Atlantic salt meadows form when halophytic vegetation colonises soft intertidal sediments of mud and sand in areas sheltered from strong wave exposure. Vast community types can inhabit salt meadows, which can cover extensive areas.

There is potential for the increased risk of introduction and spread of INNS as a result of seabed preparation and construction activities. Marine INNS may be introduced or transferred by vessels, such as through biofouling (e.g. attachment of organisms to boat hulls) or discharge of ballast water. INNS may also be introduced through towing of infrastructure to the site. INNS can have a detrimental effect on benthic ecology through predation on existing wildlife or outcompeting for prey and habitat. This can result in biodiversity changes in the existing habitats present in the benthic ecology study area. Depending on the INNS species introduced, this could potentially lead to complete loss of certain species and may result in new habitats forming (e.g. reef-forming species and invasive vegetation).

Salt meadows are susceptible to being outcompeted by INNS such as non-native common cord-grass *Spartina anglica*. There is no evidence of this species being present in the vicinity of the Offshore Site. As above, the high-risk marine INNS which have been recorded in Ireland include the carpet sea squirt (*Didemnum vexillum*), the slipper limpet (*Crepidula fornicate*), the leathery sea squirt (*Styela clava*). The carpet sea squirt and leathery sea squirt are a species of colonial sea squirt, which are native to Asia and can outcompete and smother native biological communities on rocky substrates. This species can form extensive mats over the substrata it colonises, binding boulders and cobbles and altering the host habitat (Griffith et al., 2009). Soft halophytic vegetation that forms the Atlantic salt meadows is less susceptible to the INNS. Nonetheless, while soft sediment habitats are not particularly sensitive to the introduction of INNS (De-Bastos, 2016), it is acknowledged that the slipper limpet can be found in soft sediments.

4.1.1.2.6 *Mediterranean salt meadows*

The Offshore Site does not directly overlap any SACs; however, the Kilkieran Bay and Islands SAC (1.4 km away) and Slyne Head Peninsula SAC (13.9 km away) with Mediterranean salt meadow QI are located within the 15km Zone of Influence and may potentially be affected by increased risk of introduction and spread of INNS.

There is potential for the increased risk of introduction and spread of INNS as a result of seabed preparation and construction activities. Marine INNS may be introduced or transferred by vessels, such as through biofouling (e.g. attachment of organisms to boat hulls) or discharge of ballast water. INNS may also be introduced through towing of infrastructure to the site. INNS can have a detrimental effect on benthic ecology through predation on existing wildlife or outcompeting for prey and habitat. This can result in biodiversity changes in the existing habitats present in the benthic ecology study area. Depending on the INNS species introduced, this could potentially lead to complete loss of certain species and may result in new habitats forming (e.g. reef-forming species and invasive vegetation).

As above, the high-risk marine INNS which have been recorded in Ireland include the carpet sea squirt (*Didemnum vexillum*), the slipper limpet (*Crepidula fornicate*), the leathery sea squirt (*Styela clava*). The carpet sea squirt and leathery sea squirt are a species of colonial sea squirt, which are native to Asia and can outcompete and smother native biological communities on rocky substrates. This species can form extensive mats over the substrata it colonises, binding boulders and cobbles and altering the host habitat (Griffith et al., 2009).

Soft halophytic vegetation that forms the Mediterranean salt meadows is less susceptible to the INNS. Nonetheless, while soft sediment habitats are not particularly sensitive to the introduction of INNS (De-Bastos, 2016), it is acknowledged that the slipper limpet can be found in soft sediments. Mediterranean salt meadows however occur at the upper-most level of saltmarshes, which is subject to less frequent and short periods of coverage by sea water. This makes them less susceptible to marine INNS.

4.1.1.3 Mitigation used to avoid adverse effects on site integrity

Mitigation will include implementation of the Project's Offshore Environmental Management Plan (OEMP) which includes measures for pollution prevention, biosecurity management and waste management; A Marine Pollution Contingency Plan (MPCP) and a Marine INNS management plan (MINNSMP) are included as part of the OEMP. These management plans detail the measures being taken to avoid the introduction and spread of INNS, including adherence to the BWM Convention and other applicable international regulations, as well as containment procedures in the unlikely event that INNS are found. Additional standard mitigation will be undertaken, including for swapping out ballast water, cleaning hulls, floating structures, etc.

Specific measures outlined in the Sceirde Rocks MINNSMP which are taken into account in respect of potential impacts arising at all of the European sites include:

- All vessels following guidance as directed by the 'Guidelines for the control and management of ships biofouling to minimize the transfer of invasive aquatic species' (IMO, 2023);
- Where applicable, all vessels will comply with the 'International Convention for the Control and Management of Ships' Ballast Water and Sediments' (IMO, 2021);
- Risk of INNS via the towing of GBS will be reduced with the treatment with anti-fouling paint. All anti-fouling paint will be compliant with The International Convention on the Control of Harmful Anti-fouling Systems on Ships (AFS Convention), and the Sea Pollution (Control of Anti-Fouling Systems on Ships) Regulations 2008 (S.I. No. 82/2008);
- Contractors will be required to submit a Biosecurity Risk Assessment to the Environmental Manager at least six weeks prior to operations commencing;
- The contractors must ensure that all equipment, materials, machinery, Personal Protective Equipment (PPE) and vessels used are in a clean condition prior to their arrival on site to minimise the risk of INNS introduction into the marine environment;
- The Project Ecological Clerk of Works will raise awareness of INNS, including identification guidance on the key risk species. If uncertainty arises, the following contingency measures will be followed:
    - Collaborate with the relevant Port Authority and other users of the offshore wind farm area to raise INNS awareness;
    - Assess INNS risk of any slow moving or inactive craft and take steps;
    - Ensure a Check, Clean and Dry message is sent to any new (sub) contractors;
    - Confirm origin of material used in constructing of infrastructure;
    - Ensure 'tool box' talks on INNS prevention and monitoring;
    - Liaison with Environmental Protection Agency (EPA) and National Parks and Wildlife Service (NWPS) to identify any new INNS risks and thus potential mitigation requirements are well understood and enacted as soon as possible; and
    - If required, a Contingency plan protocol will be followed as outlined in project specific MINNSMP which outlines key actions and responsibilities.

With the mitigation implemented and adhered to during the Project, the risk of introduction and spread of INNS at any of the European sites is minimised to a negligible level and therefore it can be concluded that no residual impact to the Offshore Site will arise. On this basis, there is **no adverse effect on the integrity of Kilkieran Bay and Islands SAC, Inishmaan Island SAC, Inishmore Island SAC, Carrowmore Point to Spanish Point and Islands SAC, Carrowmore Dunes SAC, Kilkee Reefs SAC, Connemara Bog Complex SAC and the Slyne Head Peninsula SAC from the introduction and spread of INNS from the Project alone.**

4.1.1.4 In combination effects on European Sites with Annex I habitat QI

This section discusses the potential effects from the Offshore Site that have the potential to interact with those from other projects (developments), plans and activities, resulting in potential in combination effects on benthic QI. The general approach to the in-combination effects assessment is described below.

Potential effects from the Offshore Site have the potential to interact with those from other projects (developments), plans and activities, resulting in in combination effects on benthic ecology receptors.

As detailed in Section 1.4.4, No plans were identified that could contribute to any in-combination effects with the Offshore Site of the Project. As such, only projects that could potentially lead to in-combination impacts were considered further.

The ZoI for benthic ecology is defined as a 15 km buffer around the OAA and OECC plus the Shannon Estuary. The benthic ecology study area covers the area over which effects on marine physical processes may occur. It is considered that this study area will encompass all in combination projects and developments which have the potential for connectivity with benthic habitats and species within the Offshore Site and associated construction, operation and maintenance and decommissioning activities occurring within the Offshore Site and adjacent waters. Additionally, the Shannon Estuary has been considered as part of the in-combination effects assessment in consideration of the potential temporary anchorage and movement of Project vessels within the estuary.

The developments within the ZOI for benthic ecology are summarised in Table 4-1. All the developments have been screened out of the in-combination assessment due to there being no temporal overlap with the Offshore Site, because they are part of the environmental baseline, are operational or there is no impact pathway that could affect the relevant benthic QIs of the Kilkieran Bay and Islands SAC, Inishmaan Island SAC, Inishmore Island SAC, Carrowmore Point to Spanish Point and Islands SAC, Carrowmore Dunes SAC, Kilkee Reefs SAC, Connemara Bog Complex SAC and the Slyne Head Peninsula SAC .

Table 4-1 List of developments considered for the Annex I Habitat in combination assessment

Development Type	Status		Screened In / Screened Out	Justification
Foreshore Licenses	Concept / Early Planning	Annex I Habitats as QI	Screened Out	The Project is the only Relevant Project / Phase 1 offshore renewable development in the region with a Maritime Area Consent (MAC), the only offshore wind development in the region which was successful in Offshore Renewable Electricity Support Scheme (ORESS) 1 and the only offshore wind development in the region, which is permitted to make a planning application. A number of proposed offshore renewable developments (at various levels of inception) were proposed to be developed off the western coast of Ireland before the State's policy changed to a plan-led regime. Current policy is such that none of these projects are permitted to seek a MAC or make a planning application. Whether any of them may progress in the future is entirely dependent on future policy decisions. Given that Government policy precludes these proposals from proceeding, in that context, it is not appropriate or necessary to assess the effects of the surveys the subject of the foreshore licence applications for these project proposals in combination with the Project
Aquaculture	Operational	Annex I Habitats as QI	Screened Out	All aquaculture sites are operational and do not present an in combinationeffect pathway on benthic ecology given they are highly localised and there are no activities being undertaken at these sites which would have potential for a temporal overlap with the Project activities.

Dumping at Sea	Inactive	Annex I Habitats as QI	Screened Out	The Shannon Foynes Port Company has an active permit (Permit No. S0009-03) for the Shannon Estuary and Foynes Harbour dumping at sea locations, located approximately 86 – 88 km from the OAA and 32 – 34 km from the OECC. The permit is valid through 31/12/2026 and therefore the activities at the dumping at sea locations will not have a temporal overlap with the construction phase of the Project.
Discharge Points	Operational	Annex I Habitats as QI	Screened Out	All discharge points are operational and do not present a in combination effect pathway on benthic ecology receptors given they are highly localised.
Urban Waste Water Treatment	Operational	Annex I Habitats as QI	Screened Out	All urban wastewater treatment locations are operational and located onshore. The potential runoff from these sites into the marine environment is not considered within the benthic ecology assessment, and therefore there is no in combination effects pathway associated with benthic ecology receptors.
Wave Data Buoys	Operational	Annex I Habitats as QI	Screened Out	The presence of buoys, temperature probes and/or other metocean and navigational devices on the sea surface does not present a in combination effects pathway for benthic ecology receptors as nearest buoy (Westwave wave buoy) lies >7 km from OEC and >50 km from OAA. There is no impact pathway to spread of INNS from this operation.
Tidbit Sea Temp Probe	Operational	Annex I Habitats as QI	Screened Out	As per wave data buoys, there are no sea probes within 7 km of the Offshore Site and no overlap with Project footprint. There is no impact pathway to spread of INNS from this operation.
Ferry Port	Operational	Annex I Habitats as QI	Screened Out	Operational ports do not present an in-combination effects pathway for benthic ecology receptors due to the operations forming the baseline for the SACs and only live permits being considered as part of the HRA process.
Navigation Buoy	Operational	Annex I Habitats as QI	Screened Out	As per wave data buoys, there are no navigational buoys within 15 km of the Project footprint and no potential in combination effect as there is no impact pathway to spread of INNS from this operation.
Lighthouses	Operational	Annex I Habitats as QI	Screened Out	Operational lighthouses onshore do not present a in combination effects pathway for benthic ecology receptors at the Offshore Site as there is no impact pathway to spread of INNS from this operation.
Planning Applications	Application Stage	Annex I Habitats as QI	Screened Out	Onshore planning applications for residential and agricultural developments do not present a in combination effects pathway for benthic ecology receptors at the Offshore Site as there is no impact pathway to spread of INNS from this operation..
ABP Cases	Application Stage	Annex I Habitats as QI	Screened Out	As per planning applications.
EIA Points	Application Stage	Annex I	Screened Out	As per planning applications.

		Habitats as QI		
Licensed Waste Facility	Operational	Annex I Habitats as QI	Screened Out	The presence of licensed waste facilities onshore does not present a in combination effects pathway for benthic ecology receptors. Furthermore, they are not a source of INNS in the marine environment.
Waste Schemes	Operational	Annex I Habitats as QI	Screened Out	As per urban waste water treatment.

No potential in combination effects from other projects with the Offshore Site activities alone have been identified. As such, there is no adverse effect on integrity of Kilkieran Bay and Islands SAC, Inishmaan Island SAC, Inishmore Island SAC, Carrowmore Point to Spanish Point and Islands SAC, Carrowmore Dunes SAC, Kilkee Reefs SAC, Connemara Bog Complex SAC and the Slyne Head Peninsula SAC from the increased SSC and associated deposition (including mobilisation of potential contaminants) or introduction and spread of INNS from the Offshore Site alone in combination with other projects, provided that the mitigation is adhered to.

4.1.2 SACs with diadromous fish and freshwater pearl mussel QI

The Appropriate Assessment Screening Report concluded that the Offshore Site lies within the 50 km ZoI of the Connemara Bog Complex SAC, Lower River Shannon SAC, Twelve Bens/Garraun Complex SAC, Maumturk Mountains SAC, Lough Corrib SAC and Mweelrea/Sheeffry/Erriff Complex SAC, and that there is potential for disturbance or damage to fish from underwater noise generated from construction activities, temporary habitat loss or disturbance (associated with prey species of diadromous fish), increases in SSC and potential sedimentation / smothering during construction, operational and maintenance and decommissioning phases, accidental release of pollutants during construction, habitat creation and fish aggregation during operational phase and effects of electromagnetic fields (EMFs) from subsea cables during the operational phase to disturb the salmon, river lamprey, sea lamprey and freshwater pearl mussel qualifying interest. These impact pathways are assessed in detail below.

Atlantic salmon and sea trout are host species for freshwater pearl mussel (*Margaritifera margaritifera*) during a critical parasitic phase of the mussel's lifecycle, when they live on the gills of Atlantic salmon or sea trout as parasites (NatureScot, 2022b). The freshwater pearl mussel larvae spend less than a year attached to the gills, and then detach and fall onto the riverbed and remain in the river habitat. Therefore, the Offshore Site only has the potential to impact freshwater pearl mussels indirectly through effects on Atlantic salmon or sea trout.

4.1.2.1 Disturbance or damage to fish due to underwater noise generated from construction activities

An increase in sound emissions from survey equipment, site investigation activities, and construction activities can have mortality, physical injury or behavioural effects on diadromous fish receptors, at an individual or population level. Behavioural effects, such as disturbance or displacement, may impact acoustic communication in fish, reproductive success, foraging, predator avoidance and navigation (Radford *et al.*, 2014; De Jong *et al.*, 2020; Hawkins and Myrberg, 1983).

Underwater sounds can be categorised as either impulsive (e.g. piling, survey equipment); or non-impulsive (or continuous) in nature (e.g. those generated by cable laying, trenching and from vessel operations). The potential impacts of anthropogenic underwater sound on diadromous fish receptors are influenced by the characteristics of the sound (i.e., determined by the frequency and intensity of the sound source), the duration of the sound against baseline background levels and the sensitivity of the species.

Underwater sound has both a pressure and particle motion component, and the majority of research on the impact of underwater sound on the marine environment focuses on the former (Nedelec *et al.*, 2016). Sound pressure changes may be detected by fish with a swim bladder, as the gas within the swim bladder changes as a result of changing sound pressure.

Particle motion has a directional component and attenuates differently in the marine environment than sound pressure (Hawkins and Popper, 2017). Diadromous fish may not only detect changes in particle motion in the water column, but those in close contact with the seabed may also detect particle motion in the substrate (Popper and Hawkins, 2018). Fish detect particle motion through otolithic organs in the inner ear which are of a greater density than the surrounding tissues and also through sensory hair cells in the lateral line (Popper and Hawkins, 2018).

The most relevant criteria for considering potential impacts on diadromous fish are considered to be those provided in the Sound Exposure Guidelines for Fishes and Sea Turtles (Popper *et al.*, 2014). Fish species are grouped into hearing sensitivity categories defined by a number of factors such as their hearing anatomy, particle motion detection, the use of sound during navigation or mating and the presence or absence of a swim bladder, as summarised in Table 4-2 below.

Table 4-2 Fish species grouped into hearing sensitivity categories (Popper et al.*, 2014)*

Group 1: Fishes that do not have a swim bladder	These species are likely to only use particle motion (and not sound pressure) for sound detection, and therefore only show sensitivity to a narrow band of frequencies (< 400 Hz). This group includes lamprey species.
Group 2: Fishes with swim bladders that do not appear to play a role in hearing	These species are likely only to be sensitive to particle motion but could be susceptible to barotrauma. They only show sensitivity to a narrow band of frequencies (<1000 Hz). This group includes salmonids, e.g. Atlantic salmon.

There will be no piling or drilling activities required for the installation of the WTGs and the OSS. Therefore, the underwater noise generated by the construction of these components will be minimal and is not considered further in this assessment. As outlined in Subacoustech (2024), the activities with the greatest potential to generate underwater sound during the pre-construction and construction phases, include:

- UXO clearance;
- Vessel operations; and
- Cable installation activities including cable laying, trenching and the placement of cable protection.

It is also recognised that trenchless technology operations at the Landfall will also generate underwater noise that could displace diadromous fish, either commencing or terminating their migration through the marine environment. Existing studies into the sound profile of HDD operations within shallow, riverine waters concluded that, in the absence of vessel noise, HDD produced a maximum unweighted Sound Pressure Level (SPL) of 129.5 dB re 1 µPa (Nedwell, Brooker, and Barham, 2012), when drilling below the riverbed. Erbe and McPherson (2017) reported an SPL of 142-145 dB rms re 1 µPa at 1 m, generated by a jack-up drilling rig undertaking geotechnical drilling in shallow water in western Australia. It is assumed that sound from trenchless technology operations would be similar to this geotechnical drilling.

At an offshore trenchless technology duct emergence location, it is most likely that vessel noise would comprise the dominant contribution to the soundscape. The sound pressure levels associated with trenchless technology installation are not of a level which could introduce a risk of injury or disturbance to diadromous fish and owing to the short term and transient nature of this activity, no impacts from trenchless technology operations on diadromous fish species are anticipated and this underwater sound source has not been considered further in this assessment.

4.1.2.2 UXO Clearance

UXO clearance has been identified as a possible noise source. The presence of potential UXO (pUXO) will be determined prior to construction. The pUXO will be investigated to verify the identification, and if required, the confirmed UXO (cUXO) will be cleared. Based on the results of pre-construction surveys, and a UXO risk assessment, there is expected to be a very low likelihood of finding UXO within the Offshore Site, as the west coast of Ireland was not subject to a high degree of bombing during World War II (WWII). Therefore, UXO clearance at the Offshore Site is very unlikely to be required.

In the extremely unlikely event that a UXO clearance operation is required, clearing of UXOs would result in a momentary (seconds) increase in underwater noise (i.e. sound pressure levels and particle motion). Underwater sound levels will be temporarily elevated, and this may result in injurious or temporary behavioural effects on fish and shellfish species. Whilst the presence of UXO is considered unlikely, this assessment represents the scenario that a UXO is identified and requires clearance (e.g. cannot be avoided).

Underwater noise modelling for UXO clearance has been undertaken by Underwater Noise Modelling and Assessment for the following clearance methods and charge weights:

- The scenario of high-order clearance of a 25 to 800 kg charge weight (+ donor charge); and
- Low-order deflagration of any charge using a 0.5 kg donor charge to vaporise the explosive material in the UXO.

The underwater noise modelling utilises the Popper *et al.* (2014) quantitative guideline values for risk of mortality and potentially mortal injury. The Popper *et al.* (2014) criteria states that for all fish species, mortality and potential mortal injury is expected to occur between 229 – 234 dB. The results of the underwater noise modelling indicate that for mortality or potential mortal injury to occur, fish would need to be within 560 – 930 m of a UXO device, assuming the highest charge weight (800 kg). Therefore, only fish in close proximity to the UXO device would be at risk.

Qualitative guidelines for the risk of recoverable injury (i.e. hair cell damage, minor internal or external hematoma and other injuries which do not result in mortality), Temporary Threshold Shift (TTS) (i.e. a temporary reduction in hearing sensitivity in which normal hearing ability returns), masking (i.e. a reduction in the detectability of a given sound as a result of the simultaneous occurrence of another sound)and behavioural effects (e.g. changes in distribution or feeding pattern) associated with explosions are also available through Popper *et al.* (2014) (Table 4-3). Qualitative guidelines present the risk of effect in relative terms as "high", "moderate" or "low" at three distances from the source: "near" (N, i.e. in the tens of metres), "intermediate" (I, i.e. in the hundreds of metres) or "far" (F, i.e. in the thousands of metres) which are independent of source level.

There is a high risk of recoverable injury and TTS within near distances of the source (i.e. tens of metres). For most fish groups, the risk of recoverable injury reduces to low at hundreds of metres from the source and the risk of TTS reduces to low at thousands of metres from the source.

For the purposes of the assessment, Table 4-3 groups fish species into hearing sensitivity categories, defined by a number of factors such as their hearing anatomy, particle motion detection, the use of sound during navigation or mating and the presence or absence of a swim bladder.

There is a high risk of masking within near distances of the source for all fish groups. The risk of masking remains high at hundreds of metres from the source and is reduced to moderate at thousands of metres of the source. The risk of behavioural effects remains as moderate for all groups at hundreds of metres from the source and is reduced to low at thousands of metres from the source.

It should be noted that the increase in underwater noise as a result of detonation is short term (seconds), where levels are temporarily elevated.

Table 4-3 Risk of recoverable injury, TTS, masking and behaviour impacts from UXO clearance (Popper et al., 2014)

Type of animal	Recoverable injury	TTS	Masking	Behaviour
Group 1: Fish with no swim bladder (particle motion detection) e.g. lamprey species	(N) High (I) Low (F) Low	(N) High (I) Moderate (F) Low	(N) High (I) High (F) Moderate	(N) Moderate (I) Moderate (F) Low
Group 2: Fish with swim bladder not involved in hearing (particle motion detection) e.g. salmon	(N) High (I) High (F) Low	(N) High (I) High (F) Low	(N) High (I) High (F) Moderate	(N) Moderate (I) Moderate (F) Low

4.1.2.3 Vessel Sound (including dredge and disposal)

There will be 23 vessels associated with the pre-construction and construction phases of the Offshore Site. The Offshore Site vessels will primarily produce low-frequency continuous sound and will temporarily elevate underwater sound levels when present at the Offshore Site (Popper and Hawkins, 2019). The temporary introduction of continuous sounds can result in changes in fish and shellfish behaviour, masking of biologically relevant sounds, and hearing impairments (de Jong et al., 2020).

Whilst studies have shown that some fish demonstrate avoidance behaviour on exposure to sound from approaching vessels, by diving to the seafloor or moving away from the vessel path (Ona *et al.,* 2007), there is minimal evidence in literature showing injury (to ear or non-auditory tissues) or mortality in fish (Popper *et al.*, 2014) from this type of sound. Despite a lack of experimental examples of sound causing death or injury to fishes, there is the potential that low levels of anthropogenic sound may cause temporary hearing impairment, behavioural and physiological changes, and masking (Popper *et al.*, 2014). Though masking effects would be short-lived due to the transient nature of the vessels as they move across the Offshore Site, it has the potential to mask signal detection for fish species that use sound for communication.

Underwater noise modelling for vessel sounds has been undertaken by Subacoustech (2024) utilising the Popper *et al.* (2014) guidelines for shipping and other continuous sound (as detailed in Table 4-4). Quantitative guideline values are not available for Group 1 (lamprey) and Group 2 (salmon) fish and only qualitative guidelines for risk are available, which are independent of source level (Popper *et al.*, 2014).

In accordance with the Popper *et al.* (2014) qualitative guidelines, the risk of mortality and potential mortal injury is low at tens of metres from the source. For diadromous fish the risk of recoverable injury is low at tens of metres from the source and the risk of TTS reduces to low at hundreds of metres from the source. The risk of masking remains is high at hundreds of metres from the source for Group 1 and Group 2 fish, reducing to moderate at thousands of metres from the source. The risk of behavioural effects is moderate out to hundreds of metres from the source, reducing to low at thousands of metres from the source for all groups.

Table 4-4 Risk of mortality and mortal injury, recoverable injury, TTS, masking and behaviour impacts from shipping and other continuous noise (Popper et al., 2014)

Type of animal	Mortality and potential mortal injury	Recoverable injury	TTS	Masking	Behaviour
Group 1: Fish with no swim bladder (particle motion detection) e.g. lamprey species	(N) Low (I) Low (F) Low	(N) Low (I) Low (F) Low	(N) Moderate (I) Low (F) Low	(N) High (I) High (F) Moderate	(N) Moderate (I) Moderate (F) Low
Group 2: Fish with swim bladder not involved in hearing (particle motion detection), e.g. salmon	(N) Low (I) Low (F) Low	(N) Low (I) Low (F) Low	(N) Moderate (I) Low (F) Low	(N) High (I) High (F) Moderate	(N) Moderate (I) Moderate (F) Low

4.1.2.4 Cable Installation (including seabed preparation)

During the construction phase, cable installation activities (including cable laying, trenching and the placement of cable protection) will also produce continuous sounds, temporarily elevating underwater sound levels. As such, there is the potential for behavioural, physiological and masking effects on fish. There is limited evidence available on the potential effects of cable installation on fish. The impacts are considered to be in line with the other construction noise discussed above for cable installation noise. The Popper et al. (2014) qualitative guidelines for vessel sounds described above, would also apply to cable installation activities.

4.1.2.5 Impact assessment for underwater noise

Overall, it is assessed that the underwater noise generated during the pre-construction and construction phase has the potential to adversely affect a small proportion of the diadromous fish (and associated freshwater pearl mussel through secondary effects) population for a short-term period (i.e. the duration of the construction period). It is predicted that the impact would affect the receptor directly.

As described above, mortal and potential mortal effects will only occur to fish within close proximity to the UXO clearance, which is not expected to be required. Recoverable injury, TTS, masking and behavioural effects may occur over larger ranges, however, a degree of recovery would be expected for these sub-lethal effects with no material effects on the fish community predicted. Any effects associated with vessel sound and cable installation would be short-term (the duration of the construction period), highly localised, intermittent / transient, and all effects are predicted to be recoverable. It should also be noted that the underwater noise modelling results assume that individuals remain stationary in respect of the noise source, which is highly unlikely to occur. In reality, most fish will be able to vacate areas experiencing high levels of underwater sound to reduce their potential susceptibility to injury. Overall, the magnitude of effect is low.

Diadromous fish are deemed to be of low vulnerability, high recoverability and high value. The sensitivity of the receptor is therefore, considered to be low. As the diadromous fish (and associated freshwater pearl mussel) are potentially only present in the vicinity of the Offshore Site during their migration, the likelihood of the fish being present during periods of high underwater noise exposure is low. As such, there will be **no adverse impact from disturbance or damage to diadromous fish and freshwater pearl mussel (secondary effect through impacts on fish hosts) due to underwater noise generated from construction activities from the Project alone.**

Despite of this, the following mitigation is used to avoid impacts of underwater noise.

- Use of GBS foundations which avoids the requirement for impact piling, which generates high-amplitude impulsive sound which would have far greater effects on acoustically sensitive species than those predicted for the Offshore Site; and
- Implementation of the Vessel Management Plan (VMP) for underwater noise mitigation to reduce the underwater noise effects associated with vessel sounds, e.g. measures including speed restrictions on Project vessels operating in sensitive areas.

4.1.2.6 Temporary habitat loss or disturbance

During the pre-construction and construction phases of the Offshore Site, temporary habitat loss or disturbance may occur as a result of the following activities:

- Landfall installation;
- Seabed preparation activities (UXO clearance, boulder clearance, bedform clearance, seabed drilling / cutting, and pre-lay grapnel runs); and
- Installation of the cables (trenching, laying, burial and protection).

The environment associated with the Offshore Site is subject to moderate levels of existing vessel traffic (including passenger, cargo and other vessel activities) and other disturbances. The additional disturbance associated with construction and decommissioning activities has the potential to result in temporary habitat disturbance, change or loss which could result in direct disturbance to diadromous fish species migrating through the Offshore Site or indirectly though impacts on their prey species.

1,132,151 m^2 of temporary habitat loss and disturbance may occur during the construction phase, intermittently over a period of approximately 41 months (including pre-construction activities e.g., UXO and boulder clearance). This includes:

- 104,071 m^2 of temporary disturbance that will occur from the dredge and disposal activities;
- 29,120 m^2 of temporary disturbance that will occur as a result of the jack-up vessels for the GBS installations (31 in total);
- 996,950 m^2 from installation of a single OEC (length 63.5 km); and
- 2,000 m^2 as a result of the Landfall installation, associated with the trenchless technology exit pit and the dredged sidecast material.

This disturbance will occur intermittently over a period of 41 months during construction, inclusive of seabed preparation in advance of construction. Activities, from seabed preparation to completion of installation, will not all occur at the same time, although some activities may overlap and occur simultaneously for a period of time. Given the intermittent nature of the activities, only a small area of seabed is expected to be disturbed at any one time.

There is the potential for diadromous fish to utilise the habitats present at the Offshore Site for feeding or for diadromous fish to pass through the Offshore Site during migrations to and from Irish rivers, including those identified as SACs. However, as diadromous fish do not rely on specific seabed habitats and are highly mobile, temporary habitat disturbance of limited spatial footprint is not likely to affect these species. Due to the temporary nature and local spatial extent, intermittent frequency and high reversibility of this disturbance, the magnitude of the effect is considered low. Diadromous fish species are considered to be of negligible vulnerability and high recoverability and as such the sensitivity of the receptor is low. The temporary habitat loss resulting from the Project will therefore have **no adverse effects on diadromous fish and associated freshwater pearl mussel QI of the Connemara Bog Complex SAC, Lower River Shannon SAC, Twelve Bens/Garraun Complex SAC, Maumturk Mountains SAC, Lough Corrib SAC and Mweelrea/Sheeffry/Erriff Complex SAC from the Project alone.**

4.1.2.7 Temporary increase in SSC

Increased SSC and associate deposition will occur as a result of seabed clearance and deposition in the OAA (via Trailer Suction Hopper Dredge (TSHD) and discrete areas of Controlled Flow Excavator (CFE) with sediment resuspension and settlement in areas adjacent to the dredge locations). It should be noted that the dredge areas are located in a region of sediment to avoid deposition on sensitive habitats (e.g. rocky substrata). Additionally, increased SSC and associated deposition will occur as a result of cable trenching activities via CFE. It should be noted that it is assumed that all IAC will be surface laid and rock protected and therefore cable trenching only applies to the OEC. Finally, there will be sediment disturbance and deposition at the nearshore HDD location (exit pit and berm).

Increased SSC and associated deposition has the potential to result in mobilisation of sediment contaminants; however, a site-specific contaminants analysis has been undertaken and concluded that overall there is considered to be a low to very low likelihood of contaminants across the Offshore Site.

Overall, the following has been assumed:

- For seabed clearance in OAA significant smothering of up to 1.5 m across an area of 0.1 km^2 using TSHD);
- For trenching of the OEC, smothering of up to 0.2 m may occur up to an area of 0.09 km^2; and
- The excavation and deposition of HDD exit pit is predicted to affect a total area of 0.0016 km^2.

Based on the assumptions above, there will be up to 0.35 km^2 of seabed affected by deposition with a minimum burial of 0.2 m.

Overall, the described increase in SSC and resulting plume would be near bed and with increasing distance and duration from the release, dilution would occur resulting in further reduction of the SSC to hundreds and tens of mg/l. By the estimated plume excursion extent, SSC would be at background levels. Furthermore, any deposition fine sediment fraction will become readily incorporated into the surrounding seabed and consequently will become part of the sediment transport regime. This process will redistribute sediments throughout the Offshore Site area and beyond, which would occur regardless of deposition induced by construction activities. For sediment deposition, as discussed above the dredging activities will result in direct deposits of sediment on the seabed.

While salmonids can be sensitive to increased SSC through reduced visual ability to detect prey (Abbotsford, 2021), effects will be limited to times when they pass through during migrations. As a highly mobile species, the fish also have the ability to move away from environmental conditions that may affect them adversely. The effect would be of a local spatial extent, short term duration, intermittent frequency and high reversibility. The magnitude is therefore considered to be low.

Diadromous fish species are generally expected to have some tolerance to elevated SSC, given their migration routes typically pass through estuarine habitats which are often characterised by more turbid waters. Additionally, migratory salmonids tend to swim within the top 5 m of the water column (Godfrey et al., 2015).

As much of the immediate disturbance associated with Offshore Site activities will occur at the seabed (disposal of dredged material, cable installation, WTG and OSS placement), and SSC will be highest here and dissipate further up the water column, species like salmon are unlikely to encounter plumes. While lamprey spp. swim closer to the seabed, any impacts from sedimentation are likely to be short lived and avoidable by the mobile species.

Any impacts on visual predation and prey species are also likely to be restricted to the immediate vicinity of the SSC source as the sedimentation returns to background levels within 14 h of the sedimentation event. As such any impacts from the increased SSC and associated release of contaminants resulting from the Project will have **no adverse effects on diadromous fish and associated freshwater pearl mussel QI of the Connemara Bog Complex SAC, Lower River Shannon SAC, Twelve Bens/Garraun Complex SAC, Maumturk Mountains SAC, Lough Corrib SAC and Mweelrea/Sheeffry/Erriff Complex SAC from the Project alone.**

4.1.2.8 Accidental release of pollutants

There is a risk of accidental pollution release during the construction phase, from sources such as vessels and equipment. This has the potential to have detrimental effects on diadromous fish receptors by damaging individuals exposed to pollutants.

Vessels involved with the installation and construction activities will discharge liquid effluents (i.e. non-hazardous waste) into the sea during operations. For vessels with suitable sewage treatment systems, it will be treated and discharged in line with anti-pollution regulations (e.g. International Convention for the Prevention of Pollution from Ships (MARPOL)). In terms of food waste, macerated or ground and may be discharged at sea (beyond 3 nautical miles (NM) from shore), or 12 NM from shore if not macerated or ground, in line with MARPOL. All routine discharges will be rapidly dispersed by water currents and will not result in any significant reduction in the sediment or water quality in the Offshore Site and surroundings.

Accidental release of pollutants may have an adverse effect on diadromous fish receptors. It is predicted that the impact will affect the receptor both directly and indirectly. An accidental event such as a vessel collision has the potential to result in the release or spillage of fuel or other contaminants from vessels. The initial result of such a spill or leakage would likely include physical disturbance at the discharge location. Based on the unlikely event that a pollution event will take place combined with the area being a high energy environment, any spills or leakages are likely to disperse rapidly, and the impact will be highly localised. The effect would be of a local spatial extent, long term, rare frequency / one off with a low reversibility. If severe, it is predicted that the effect could result in a partial alteration or alteration to the integrity of the fish populations if directly exposed to the spill.

Diadromous fish are considered very mobile species and therefore have a low vulnerability to pollution given their mobility to avoid areas of release. Furthermore, the spawning grounds for the species are located in rivers outside the Offshore Site boundaries. However, it should be noted that contamination of marine prey including plankton and small fish species may lead to aromatic hydrocarbons accumulating in the food chain for all receptors.

Diadromous fish species undertake osmoregulation to stabilise an internal environment, despite changes in composition of the external water. This can help them cope with fluctuations in water quality resulting from pollution and provides them with a resilience against accidental releases (Romano and Zeng, 2012; Nisembaum, *et al.,* 2021; Lillywhite and Evans, 2021). Diadromous fish are considered to be of low sensitivity due to their low vulnerability, medium recoverability and high value.

All Project activities will comply with marine pollution prevention measures required under the MARPOL convention. The Project has prepared a Marine Pollution Control Plan (MPCP) which includes:

- Measures for pollution planning, outlining procedures to protect personnel working and safeguard the environment should a pollution event occur;

- A MPCP created for the Offshore Site with consideration of the National Maritime Oil/Hazardous Noxious Substance (HNS) Spill Contingency Plan;
- Adherence to the MARPO) and Ballast Water Management (BWM) Conventions, including Shipboard Oil Pollution Emergency Plans (SOPEP); and
- Implementation of a Construction Environmental Management Plan (CEMP), including measures for pollution prevention, biosecurity assessment and waste management.

The MPCP will be implemented during construction. It should be noted that accidental release of potential contaminants from construction vessels is not expected and is unlikely to occur given the mitigation measures and implementation of relevant management plans.

Overall, the risk of accidental releases of pollution is extremely low. Any residual impact are considered to be extremely unlikely, long term, one-off. As such, the accidental release of pollutants resulting from the Project will have **no adverse effects on diadromous fish and associated freshwater pearl mussel QI of the Connemara Bog Complex SAC, Lower River Shannon SAC, Twelve Bens/Garraun Complex SAC, Maumturk Mountains SAC, Lough Corrib SAC and Mweelrea/Sheeffry/Erriff Complex SAC from the Project alone.**

4.1.2.9 Introduction of new hard substrate and potential for fish or predator aggregation

The presence of up to 30 WTG, one OSS GBS foundation structures and external cable protection (e.g. rock) may introduce new structures for habitat creation and create artificial reef effects, with the potential for fish and predator aggregation as an indirect impact during the operational phase of the Project. The introduction of hard infrastructure alters previously soft sediment habitat areas, which can attract new species and increase the habitat complexity and biodiversity of the area (Degraer *et al.,* 2020), and may result in the provision of shelter and increased food availability, especially for higher trophic level species (Degraer *et al.*, 2020).

Inger *et al.,* (2009) pose the concern that Fish Aggregating Devices (FADs), such as subsea infrastructure from offshore wind farms, focus fish stock in a specific region without necessarily enhancing productivity. Nonetheless, there is evidence indicating that artificial reefs formed by marine structures could offer both a food source and shelter, potentially increasing the productivity of an area (Langhamer and Wilhelmsson, 2009; Wilhelmsson *et al.,* 2006; Linley *et al.,* 2007). The amplification of the reef or aggregation effect is anticipated to be most pronounced in uniform sandy regions where WTGs are installed. In contrast, in areas with a more diverse substrate, the installation of WTGs is expected to result in less aggregation. Reef and aggregation effects are expected to be greater in areas of homogeneous sands, and as the substrate becomes more heterogeneous the aggregation effect decreases as a result of WTG installation (Xoubanova and Lawrence, 2022). The seabed present in the OAA and OECC is relatively heterogenous, consisting of a mosaic of rocky and sediment habitat types.

Xoubanova and Lawrence (2022) summarise the current understanding regarding the reef and fish aggregation effects associated with offshore renewable developments. Post-construction monitoring at operational UK offshore wind farms has not produced definitive conclusions regarding the potential for reef or aggregation effects. Nevertheless, extended monitoring at European Union windfarms suggests alterations in fish communities within operational wind farm areas. For instance, a study (Stenberg et al., 2011; 2015) at the Horns Rev 1 offshore windfarm in Danish waters, where fishing activity is restricted at operational windfarms, revealed no adverse impacts on fish communities. Instead, it observed a higher abundance of fish within the wind farm area, increased diversity near the WTGs, and no decline in the abundance of sandeels, a species favouring sandy sediments that may be displaced with the introduction of hard substrate.

Up to 1,675,691 m^2 of hard substrate will be introduced across the Offshore Site. However, it should be noted that as the infrastructure is three dimensional, the area available for colonisation for artificial reef creation will be greater than this. The stonebed areas and cable protection will be installed in discrete locations across the Offshore Site, rather than a continuous area.

Species in higher trophic levels are considered to be most likely to benefit from potential reef and aggregation effects (Degraer *et al.*, 2020). This is demonstrated by Reubens *et al.* (2013a; 2013b) which studied cod catches at an operational wind farm site in the Belgian North Sea. The study found an increase of cod catches (a piscivorous species) in areas adjacent to the WTGs as the cod aggregated around the foundations and over areas of hard substrate. Evidence also shows that individual harbour seals use wind farms for foraging likely due to artificial reefs on the WTG and OSS foundations (Russell *et al.* 2014). Therefore, there is a potential for an increase in presence of piscivorous fish and other predators at the Offshore Site, leading to an increased risk of predation on diadromous fish during their migration through the area. Whilst exact migratory patterns to and from rivers on the west coast of Ireland are unclear, there is the potential of Atlantic salmon migration and lamprey spp. to migrate through the Offshore Site.

Fish and predator aggregation could result in increased diadromous predation. Predation of salmon post-smolts during the early stages of migration could result in a substantial degree of mortality and impact adult returns (Gillson *et al.,* 2022), and impact wider population levels.

This impact can either have a positive or adverse effect on diadromous fish, depending on their position in the food chain. It is predicted that the impact will affect the receptor both directly and indirectly. The effect would be of local spatial extent (1,675,691 m^2), permanent duration, continuous frequency and low reversibility. Overall, the magnitude is considered to be low. Overall, diadromous fish are considered to have a high vulnerability to this impact, due to the potential for increased predation on juveniles which can have wider impacts on adult returns. Habitat creation during operation and maintenance will have a low magnitude, adverse, direct, likely, permanent, continuous and irreversible impact on diadromous fish receptors. Combined with the high sensitivity of diadromous fish, it is concluded that habitat creation will have non-significant effect on the diadromous fish.

As such, the introduction of new hard substrate and potential for fish or predator aggregation resulting from the Project will have **no adverse effects on diadromous fish and associated freshwater pearl mussel QI of the Connemara Bog Complex SAC, Lower River Shannon SAC, Twelve Bens/Garraun Complex SAC, Maumturk Mountains SAC, Lough Corrib SAC and Mweelrea/Sheeffry/Erriff Complex SAC from the Project alone.**

4.1.2.10 Effects from EMF arising from the cables during operation

The operation of the cables will result in emission of localised EMFs which have the potential to alter the behaviour of marine organisms that are able to detect electric (E-fields, measured in volts per metre (V/m)) or magnetic (B-field, measured in micro Tesla (μT)) components of the fields. The B-field penetrates most materials, and therefore, is emitted into the marine environment, thus resulting in an associated induced electric (iE)-field. When relative motion is present between B-fields and a conductive medium (e.g. sea water), negligible iE-fields are produced. The direct E-fields are blocked by the use of conductive sheathing within the cable, and hence are not considered further. Earth has its own natural geomagnetic field (GMF) with associated B and iE-fields which species rely on for navigation (Gill and Desender, 2020; Winklhofer, 2009). The natural iE-fields result from sea water interacting with the natural GMF, due to relative motion caused by the Earth's rotation, and tidal currents (Gill and Desender, 2020).

Marine renewable energy researchers, developers, and regulators widely agree that EMFs transmitted via cables from individual or a small number of devices are likely to exhibit comparatively low intensities. As a result, the extent of their impact is very localized, posing minimal risk to sensitive marine species due to the low potential for encounters with these animals.

In terms of the source of EMF from the Offshore Site, this will comprise:

- A network of IAC HVAC cables (up to 110 kV), with a length of 73 km;
- One Offshore Export HVAC Cable (the OEC) (220 kV) with a length of 63.5 km.

Numerical modelling studies show that EMFs decrease with distance from the cable core (Hutchison et al., 2021; Chainho et al., 2021). Cable burial and protection can provide some distance between the EMF source and the receptor species, therefore reducing their risk of EMF exposure (Albert et al., 2020). Whilst the minimum depth of lowering is 1.0 m and the minimum cable protection height for rock berms is 1.6 m (Table 10 9) or the cable will be protected with a cast iron shell, there will always be, regardless of cable protection measures, a degree of separation of diadromous receptors from the source of EMF emissions, minimising the field strength likely to be encountered.

An EMF assessment has been undertaken to ascertain the likely EMF strengths (B-fields only; E-fields will not extend beyond the cable sheathing and iE fields are negligible) along the IAC and OEC, as detailed in the Appropriate Assessment Screening Report and its appendices, attached here as Appendix 1. For the IAC, the maximum B-field emissions are predicted to be 30.3 µT at the seabed surface where case iron shell protection is used (and the cable is surface laid without any external rock protection) and 17.7 µT at the seabed surface assuming 1 m depth of lowering. For the OEC, the maximum B-field emissions are predicted to be 48.3 µT at the seabed surface where case iron shell protection is used (and the cable is surface laid without any external rock protection) and 25.3 µT at the seabed surface assuming 1 m depth of lowering. The natural background GMF at Project area is predicted to be 50 µT. Therefore, the B-fields are all anticipated to be less than the natural background GMF.

Given the strength of the cable B-field at the seabed or at the surface of the cast-iron shell is below the level of natural (background) geomagnetism at the location of the OAA and OECC (NCEI, 2019), the cable electromagnetism is not likely to be detectable by diadromous fish receptors beyond the immediate vicinity of the cable.

Contained within the skeletal structure of diadromous fish is magnetically sensitive material which enables them to use EMFs as a navigational tool during migration (Gill and Bartlett, 2010). Consequently, the introduction of anthropogenic EMF into the marine environment has the potential to alter these migratory behaviours, potentially resulting in increased energy expenditure, although the extent of the effect of EMF on migratory species in unclear (Gill and Bartlett, 2010).

Atlantic salmon, sea lamprey and river lamprey may pass through the ZoI during migrations. While exact migration pathways are little understood and are likely to be diffuse across the rivers within ZoI, rivers important to such species are present along the coastline.

The impact is predicted to adversely affect diadromous fish receptors directly. This impact would be continuous throughout the lifetime of the Offshore Site but is reversible upon decommissioning. This impact will occur over a local spatial extent (i.e. within the immediate vicinity of the source), with EMF emissions dissipating rapidly from the source. Overall, the magnitude is therefore considered to be low.

No field studies are available on the response of Atlantic salmon to EMF. Wyman et al. (2018) investigated the effect of EMF from a DC undersea cable near San Francisco, California on Chinook salmon (*Oncorhynchus tshawytscha*). It was concluded that the EMF emitted did not affect salmon migration and survival, although slight deviation from typical migratory routes was observed. In a laboratory setting, Armstrong et al. (2015) also did not find any physiological or behavioural response of Atlantic salmon to B-fields at intensities of 95 µT and below, noting that the expected B-field magnitude for the Project would be a maximum of 48.3 µT.

Most migratory salmonids swim within the top 5 m of the water column (Godfrey et al., 2014). Therefore, they would not be affected by EMF emitted from buried cables, given the limited influence of EMF within a matter of metres of the seabed.

Diadromous fish species are deemed to be of low vulnerability and high recoverability to effects of EMF. EMF effects during operation and maintenance will have a likely direct adverse, negligible, long term, continuous and reversible impact on diadromous fish receptors. Combined with the low sensitivity of diadromous fish, it is concluded that EMF effects will have a not significant negative effect on this receptor.

As such, EMF effects resulting from the Project will have **no adverse effects on diadromous fish and associated freshwater pearl mussel QI of the Connemara Bog Complex SAC, Lower River Shannon SAC, Twelve Bens/Garraun Complex SAC, Maumturk Mountains SAC, Lough Corrib SAC and Mweelrea/Sheeffry/Erriff Complex SAC from the Project alone.**

4.1.2.11 In combination effects on European Sites with diadromous fish or freshwater pearl mussel QI

This section discusses the potential effects from the Offshore Site that have the potential to interact with those from other projects (developments), plans and activities, resulting in potential in combination effects on diadromous fish QI. The general approach to the in-combination effects assessment is described below.

As detailed in Section 1.4.4, No plans were identified that could contribute to any in-combination effects with the Offshore Site of the Project. As such, only projects that could potentially lead to in-combination impacts were considered further.

The list of relevant developments for inclusion within the in-combination effects assessment is outlined in Table 4-5. This has been informed by a screening exercise, undertaken to identify relevant developments for consideration within the in-combination effects assessment. The ZoI is 50 km and provides a local (i.e. within the Offshore Site) and regional context for fish species. Additionally, the Shannon Estuary has been considered as part of the in-combination effects assessment in consideration of the potential temporary anchorage of the GBS foundations and movement of Project vessels within the estuary.

It is important to note that there are no developments of an equivalent scale or type to the Project within the in combination ZoI. To date, there has been little, large-scale construction on the west coast of Ireland generally. Therefore, many of the relevant developments in Table 4-5 represent short-term, localised activities which are not generally associated with any long-term infrastructure presence.

There are 97 aquaculture sites within the in combination ZoI. The closest aquaculture site (the Udaras na Gaeltachta site) is located 6.3 km from the OAA. The nature of these developments is such that their associated impacts are universal between sites. While these operational developments are considered part of the baseline environment, aquaculture farms, in particular those focussing on finfish production, will discharge and deposit detritus/sediments. However, the scale of this will be minimal allowing for rapid reincorporation of sediments into the local transport regime and therefore will not result in SSC impacts on fish and shellfish receptors. Owing to the very small scale at which these deposits will occur in relation to the Project, aquaculture sites are not considered further within the in-combination effects assessment.

A number of wave buoys, navigation buoys, and sea temperature probes are located within the in combination ZoI. These are grouped together given their similarities as small pieces of sea surface infrastructure. The closest navigation buoy within the ZOI is at Killeaney. This buoy is 15.36 km from the OECC. There are 15 sea temperature probes within the in combination ZoI. These probes occur at a high density amongst the islands along the coast of the mainland, northeast of the OAA. The closest probe was installed in Kilkieran Bay in 2004 and is 7.97 km from the OAA. There is a single (Westwave) wave buoy located 7.66 km due west of the Landfall location. These operational buoys are considered part of the baseline environment and, though they remain present within the in combination ZoI, they have no associated continuous operational impact on the environment. Therefore, there is no opportunity for in combination effects together with the impacts associated with the Project.

Consequently, wave buoys, navigation buoys, and sea temperature probes are not considered further in the in-combination effects assessment.

There are a number of ferry ports located within the in combination ZoI. However, these ports are operational and have no associated licenced maintenance or dredging activities. Consequently, it is assumed that these port locations do not generate any impacts equivalent to those associated with the Project. Therefore, there is no opportunity for in combination effects. Ferry ports are therefore not considered further within the in-combination effects assessment.

Urban waste water treatment locations are located along the coast; however, as these locations are all terrestrial and are concerned with treatment activities which occur onshore, these waste water treatment locations are not considered further in the in-combination effects assessment. However, some water treatments are co-located with discharge points which do discharge of treated waste water effluent directly from the coast or into estuaries and therefore have the potential to impact diadromous fish QI. These discharge points, and others along the coast which output directly into coastal or estuary waters are considered further in the in-combination effects assessment. A total of four such discharge points are listed in Table 4-5.

Two operational wave test sites are located within 50 km of the Offshore Site. These sites are considered part of the baseline environment and, though they remain present within 50 km of the Offshore Site, they have no associated continuous operational impact on the environment. Therefore, there is no opportunity for in-combination effects together with the impacts associated with the Project. Consequently, operational wave test sites are excluded from the in-combination effects assessment.

The Project is the only Relevant Project / Phase 1 offshore renewable development in the region with a Maritime Area Consent (MAC), the only offshore wind development in the region which was successful in Offshore Renewable Electricity Support Scheme (ORESS) 1 and the only offshore wind development in the region, which is permitted to make a planning application.

There were a number of planned offshore renewable developments (at various levels of inception) proposed to be developed off the western coast of Ireland before the State's policy changed to a plan-led regime. Current policy is such that none of these projects are permitted to seek a MAC or make a planning application. However, whether any of these offshore renewables projects progress in the future is entirely dependent on future policy decisions. Therefore, foreshore licences related to these projects have been excluded from the in-combination effects assessment.

The nearest licenced dumping at sea (dredge and disposal) activities occur as part of maintenance dredging associated with the Kilrush Marina, located within the Shannon Estuary. Vessels associated with the dumping at sea activities may have in combination effects with the vessels associated with the Project. Therefore, licenced dumping at sea is considered within the in-combination effects assessment.

Table 4-5 provides the list of relevant developments for inclusion within the in-combination effects assessment. These developments have been assessed against the potential impacts on diadromous fish QI. The assessment can be found in Table 4-6.

Table 4-5 1 List of developments considered for the diadromous fish and freshwater pearl mussel in combination assessment

Location	Development Type	Development Name	Distance to OAA (km)	Distance to OECC (km)	Status	Additional Information	Considered further
Foreshore Licence							
Galway	Cable	IRIS sub-sea fibre optic cable system	0.00	71.87	Operational	Licence for Construction of Cable. 2022-overall duration 2-3 months.	No – operational project is considered part of baseline conditions.
Galway	Scientific research	UCD Research Experiments, Inishmaan	13.12	28.21	Operational	Licence for Data Monitoring Equipment. 2022-2027.	No – operational project is considered part of baseline conditions.
Clare / Kerry	Cable	Cross Shannon Cable Project	21.54	80.04	Operational	Determination – Cable Operational.	No – operational project is considered part of baseline conditions.
Dumping at Sea							
Shannon Estuary	Dredged material / dredge and disposal	Shannon Foynes Port Company	86.61	32.48	Permit valid through 31/12/2026	Permit No. S0009-03	No – permit has no temporal overlap with the construction phase of the Project.
Discharge Points							
Kilkee	Discharge Point	Kilkee	64.40	11.90	Active	Discharge in coastal water	Yes
Kilrush	Discharge Point	Kilrush	73.21	14.85	Active	Discharge in coastal water	Yes
Ennistymon	Discharge Point	Ennistymon Waste Water Treatment Plant	53.16	25.99	Active	Discharge to estuary	No – estuaries typically experience naturally elevated levels of SSC such that any additional discharge will likely be readily incorporated

Location	Development Type	Development Name	Distance to OAA (km)	Distance to OECC (km)	Status	Additional Information	Considered further
							into the local environment and therefore no impact on diadromous fish and freshwater pearl mussel receptors is expected considering the intervening distance of ~26 km.
Clifden	Discharge Point	Clifden Waste Water Treatment Plant	21.37	26.79	Active	Discharge to estuary	No – estuaries typically experience naturally elevated levels of SSC such that any additional discharge will likely be readily incorporated into the local environment therefore no impact on diadromous fish and freshwater pearl mussel receptors is expected considering the intervening distance of over 30 km.

Table 4-6 Impacts requiring consideration in in combination effects assessment

Effect	Screening	Justification
Construction Phase		
Disturbance or damage to fish and shellfish due to underwater noise generated from construction activities	Out	There is not considered to be any sound emissions associated with the discharge points and therefore this impact pathway has been screened out for these in combination projects.
Temporary habitat loss or disturbance	Out	The discharge points will not introduce any infrastructure or vessel activity to the extent that will result in habitat loss or disturbance. Consequently, this impact is not considered further for the in-combination effects assessment.
Long-term habitat loss	Out	No additional permanent habitat will be introduced by the foreshore licence activities or discharge points to the extent that will result in habitat loss or disturbance. Consequently, this impact is not considered further for the in-combination effects assessment.
Temporary increase in SSC	In	There is potential for an in-combination effect.
Accidental release of pollutants	In	There is potential for an in-combination effect.
Operational Phase		
Habitat creation and fish aggregation	Out	No additional infrastructure will be introduced by the discharge points to the extent that will result in habitat creation. Consequently, this impact is not considered further for the in-combination effects assessment.
Temporary increase in SSC	In	Discharge points by their nature which output directly into coastal or estuary waters are considered further in the in combination effects assessment.

Effect	Screening	Justification
EMF effects	Out	No additional cables being installed at the discharge points. Consequently, this impact is not considered further for the in-combination effects assessment.
Thermal emissions	Out	No additional cables being installed at the discharge points. Consequently, this impact is not considered further for the in-combination effects assessment.
Underwater noise	Out	There is not considered to be any sound emissions associated with the discharge points and therefore this impact pathway has been screened out for these in combination projects. Therefore, this impact is not considered further for the in-combination effects assessment.
Barrier effects	Out	No additional infrastructure being installed at the discharge points. Consequently, this impact is not considered further for the in-combination effects assessment.
Ghost fishing	Out	No additional subsea structures are being introduced at the discharge points that would result in entanglement. Consequently, this impact is not considered further for the in-combination effects assessment.
Decommissioning Phase		
Disturbance or damage to fish and shellfish due to underwater noise generated from construction activities	Out	The Project activities proposed during the decommissioning phase will result in residual effect levels the same as, or less than, those assessed for the construction phase of the Project. Therefore, there are no additional in combination considerations specific to the decommissioning phase. Consequently, decommissioning impacts are not considered further for the in-combination effects assessment.
Temporary habitat loss or disturbance	Out	
Temporary increase in SSC	Out	
Accidental release of pollutants	Out	

4.1.2.12 In combination effects from increases in SCC and accidental release of pollutants

The presence of discharge points will also result in potential increases to SSC and sediment dispersion. These discharge points are active; therefore this activity already forms part of the baseline environmental conditions however, it is acknowledged that such discharges may change over time. The discharge points at Kilkee and Kilrush discharge directly into coastal waters within 15 km of the Landfall. Sediment plumes associated with CFE clearance activities (which may occur within the OECC), could extend up to several kilometres from the site of activity but will be <15 km. The discharge points will release mostly treated urban wastewater which will likely contain variable sediments/substances and have the potential to contribute to release of pollutants. It can be assumed that the extent of any sediment plumes and sediment dispersion associated with the discharge points will be on a par with, or less than that associated with construction activities. Consequently, there is no opportunity for these plumes to interact in combination.

The Offshore Site alone was deemed to not have an adverse effect on SAC with diadromous fish or freshwater pearl mussel QI. The residual effect for accidental release of pollutants is considered to be insignificant. The highly localised scale of any SSC or accidental release of pollutants from the discharge points means there is no potential for in combination effects with regards to these impacts, and **no adverse effect on site integrity from the Offshore Site alone in combination with other projects is found.**

4.1.3 Marine mammal QI

The Appropriate Assessment Screening Report concluded that the Offshore Site lies within 100 km of the

- Inishmore Island SAC (< 1 km away but without overlapping the Offshore Site),
- Kilkieran Bay and Islands SAC (1.4 km away),
- Lower River Shannon SAC (8.8 km away),
- Slyne Head Peninsula SAC (13.4 km away),
- Slyne Head Islands SAC (17.4 km away),
- West Connacht Coast SAC (22.7 km away),
- Galway Bay Complex SAC (43.2 km away),
- Blasket Islands SAC (90.1 km away) and
- Duvillaun Islands SAC (91.5 km away)

and that there is potential for disturbance or injury to QI due to underwater noise generated from construction activities, death or injury due to direct exposure to UXO detonations and disturbance due to physical presence of vessels during construction.

A further 34 SACs overlap with the relevant cetacean MUs (West Coast of Ireland MU and Shannon Estuary MU for bottlenose dolphin; Celtic and Irish Seas MU for harbour porpoise; IAMMWG, 2023) (Table 3-9). All of these additional SACs are >100 km from the Offshore Site, beyond 100 km range for LSE which was determined on the basis of the greatest impact pathway.

These sites are:

- Kenmare River SAC (Ireland)
- Hook Head SAC (Ireland)
- Belgica Mound Province SAC (Ireland)
- Roaringwater Bay and Islands SAC (Ireland)
- Gweedore Bay and Islands SAC (Ireland)
- Bunduff Lough and Machair/Trawalua/Mullaghmore SAC (Ireland)

- St John's Point SAC (Ireland)
- Carnsore Point SAC (Ireland)
- Blackwater Bank SAC (Ireland)
- Lough Swilly SAC (Ireland)
- Codling Fault Zone SAC (Ireland)
- Rockabill to Dalkey SAC (Ireland)
- North Channel SAC (UK)
- West Wales Marine / Gorllewin Cymru Foro SAC (UK)
- Bristol Channel Approaches / Dynesfeydd Môr Hafren SAC (UK)
- Mers Celtiques - Talus du golfe de Gascogne SCI (France)
- North Anglesey Marine / Gogledd Môn Foro SAC (UK)
- Lambay Island SAC (Ireland)
- Nord Bretagne DH SAC (France)
- Ouessant-Molène SAC (France)
- Abers - Côte des legends SAC (France)
- Chaussée de Sein SAC (France) (France)
- Côte de Granit rose-Sept-Iles SAC (France)
- Baie de Morlaix SAC (France)
- Côtes de Crozon SAC (France)
- Récifs et landes de la Hague SAC (France)
- Anse de Vauville SAC (France)
- Banc et récifs de Surtainville SAC (France)
- Baie du Mont Saint-Michel SAC (France)
- Estuaire de la Rance SAC (France)
- Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard SAC (France)
- Cap d'Erquy-Cap Fréhel SAC (France)
- Baie de Saint-Brieuc SAC (France)
- Tregor Goëlo Es SAC (France)

These sites were taken forward to the NIS for consistency with the approach required by the competent authority for previous applications for a Foreshore Licence (FS007161/FS007543) by the Project. However, it should be noted that there is no evidence that individuals associated with these European sites >100 km from the Offshore Site would occur within the range of potential effects (considered to be a maximum of 26 km, for behavioural disturbance to harbour porpoise resulting from UXO detonation).

The relevant impact pathways are assessed in detail below.

4.1.3.1 Disturbance or injury to QI due to underwater noise generated from construction activities

During pre-construction and construction, there is the potential for the generation of underwater sound which may result in injury, mortality, and/or disturbance to marine mammal QI. The following construction activities generate underwater sound and have the potential to cause injury, disturbance and/or displacement and include:

- Pre-construction geophysical surveys;
- Construction sound, such as cable laying, rock placement, and trenching; and
- UXO clearance.

4.1.3.2 Disturbance from geophysical survey noise

A Foreshore Licence was granted on 5th September 2023 for the pre-construction surveys associated with site investigations, including a geophysical survey. As described in the Sceirde Rocks Offshore

Wind Farm Foreshore Licence Areas NIS (L-100725-S00-A-REPT-007; as revised April 2023), the geophysical survey programme includes Multibeam Echosounder (MBES), Side Scan Sonar (SSS), magnetometer, Sub-Bottom Profiler (SBP) and an Ultra High Resolution Seismic (UHRS) survey using a slightly higher energy source (only if sufficient depth data cannot be obtained using the SBP). Thus, the potential for noise associated with these geophysical survey activities has been considered within the following assessment on the marine mammal QIs of European sites. The sound pressure associated with the geophysical survey equipment is presented in Table 4-7.

Table 4-7 Summary of Indicative Survey Methodology Operating Sound Pressures

Sound source	Frequency	Sound Pressure Level (dB re 1 µPa @ 1 m)
Multi-beam echo sounder	200 – 700 kHz	200 – 228
Side scan sonar	300 – 900 kHz	228
SBP (Pinger, Chirp, Parametric)	2-16 kHz	200-226
UHRS (Sparker/Boomer)	2.5 kHz	204-216 / 208-215

This assessment considers the potential for disturbance from geophysical survey noise to result in injury and/or disturbance to harbour porpoise, bottlenose dolphin, grey seal and harbour seal as the marine mammals QIs of the SACs screened in, including:

- **Inishmore Island SAC [000213]** – Harbour porpoise;
- **Kilkieran Bay and Islands SAC [002111]** – Harbour porpoise, harbour seal;
- **Lower River Shannon SAC [002165]** – Bottlenose dolphin;
- **Slyne Head Peninsula SAC [002074]** – Bottlenose dolphin;
- **Slyne Head Islands SAC [000328]** – Bottlenose dolphin, grey seal;
- **West Connacht Coast SAC [002998]** – Bottlenose dolphin, harbour porpoise;
- **Galway Bay Complex SAC [000268]** – Harbour seal;
- **Blasket Islands SAC [002172]** – Harbour porpoise, grey seal; and
- **Duvillaun Islands SAC [000495]** – Bottlenose dolphin, grey seal.

The assessment also considers a further 32 SACs with marine mammal QIs which were included for consistency with the approach required by the competent authority for a previous application for a Foreshore Licence (FS007161/FS007543) by the Project. However, it should be noted that there is no evidence that individuals associated with these European sites >100 km from the Offshore Site would occur within the range of potential effects (considered to be a maximum of 26 km, for behavioural disturbance to harbour porpoise resulting from UXO detonation).

A number of mitigation measures have been incorporated into the design of site investigation surveys, including:

- Marine mammal monitoring using a qualified MMO to monitor marine mammals and log all relevant events. The MMO will carry out visual observations before the soft-start commences and will recommend delays in the commencement of site investigations should any species be detected;
- Pre-start monitoring will be carried out visually by the MMO and will be conducted for a pre-soft start search of 30 minutes i.e. prior to the commencement of SBP and UHRS operations. This will involve a visual observation (during daylight hours) to determine if any marine mammals are within the relevant zone of the activities as per the DAHG 2014 guidance;
- A mitigation zone of 1,000 m around the UHRS sound source and a 500 m radial distance around the SBP sound source will be used. Should any marine mammal

species be detected within the monitored zone, the acoustic survey will not commence until the animals have moved out of the relevant mitigation zone or the transit of the survey vessel takes it away from them;
- A soft start (i.e. a gradual ramping up of power over time) will be conducted to give any marine mammals adequate time to leave the area;
- Where the duration of a survey line or station change is greater than 40 minutes, the activity will, on completion of the line/station being surveyed, either cease or undergo a reduction in energy output to a lower state;
- If there is a break in sound output for a period of 5-10 minutes, MMO monitoring will be undertaken to check that no marine mammals are observed within the Monitoring Zone;
- Reporting by the MMO will follow standard guidance (DAHG, 2014) and will be completed within 30 days of completion of any geophysical survey activity; and
- Project vessels will be moving at a maximum speed of approximately 5 knots during surveys to allow marine mammal species to move away from vessels.

Injury

The soft-start procedure included in the protocol 'Guidance to Manage the Risk to Marine Mammals from Manmade Sound Sources in Irish Waters' (DAHG, 2014) is to the current guidance, where the purpose is to ensure that even the most sensitive of marine mammal species (i.e. harbour porpoise, bottlenose dolphin, grey seal, harbour seal) are protected from injury impacts from site investigation underwater noise sources. In consideration of the relevant mitigation measures being applied, no marine mammal would be within the monitored zone and therefore no injury impact will occur. For these reasons, it is highly unlikely that any injury impacts from use of the geophysical survey equipment would have an adverse effect on conservation objective of harbour porpoise, bottlenose dolphin, grey seal or harbour seal and there will be no adverse effect on the integrity of any European site. This is on the basis that the site investigation activities will not impair the ability of any individual marine mammal to survive or reproduce.

Disturbance

As the survey vessel will not be stationary for prolonged periods during the site investigation activities, animals within a particular area will not be exposed to extended periods of underwater noise. Rather, individuals would have to follow the moving equipment to be subjected to lasting or prolonged periods of noise which may have detrimental effects at the individual or population level (i.e. a significant disturbance), which is highly unlikely. The survey activities are anticipated to be completed in periods of 2-3 months, and within this time there will be periods of inactivity during weather downtime. Given the transient and short-term nature of the survey and vessel activities, and through strict adherence to the DAHG (2014) guidance and other mitigation measures listed above, it is highly unlikely that any disturbance impacts from use of the geophysical survey equipment would have an adverse effect on conservation objective of harbour porpoise, bottlenose dolphin, grey seal or harbour seal and there will be no adverse effect on the integrity of any European site. This is on the basis that the level disturbance is highly unlikely to affect the ability of any individual marine mammal to survive or reproduce.

Conclusion

Given the strict adherence to the mitigation measures outlined above, disturbance impacts from use of the geophysical survey equipment will have **no adverse effect on the populations of the marine mammal QI of the Inishmore Island SAC, Kilkieran Bay and Islands SAC, Lower River Shannon SAC, Slyne Head Peninsula SAC, Slyne Head Islands SAC, West Connacht Coast SAC, Galway Bay Complex SAC, Blasket Islands SAC and Duvillaun Islands SAC, or any other SAC with marine mammal QIs at a greater distance from the Offshore Site, resulting from the Project alone.** This is on the basis that the level of disturbance is highly unlikely to affect the ability of any individual marine mammal to survive or reproduce.

4.1.3.3 Injury to marine mammals from construction sound

Underwater sound is considered to affect marine mammals when the frequency of the sound is within the hearing range of the individual (defined in Southall *et al.*, 2019; Table 4-8) and exceeds a threshold for disturbance or injury.

Table 4-8 Marine mammal functional hearing groups based on their generalised hearing sensitivity (Southall et al., 2019)

Hearing group	Species	Generalised hearing range	Peak sensitivity (kHz)	Region of greatest sensitivity (kHz)
High-frequency (HF) cetaceans	Bottlenose dolphin	150 Hz - 160 kHz	58	8.8 – 110
Very high-frequency (VHF) cetaceans	Including harbour porpoise	275 Hz - 160 kHz	105	12 – 140
Phocid carnivores in water (PCW)	Harbour seal, grey seal	50 Hz - 86 kHz	13	1.9 – 30

Sound thresholds are the levels of sound that could result in disturbance or injury, based on the nature of the sound (impulsive vs. non-impulsive) and the type of injury, which can include Permanent Threshold Shift (PTS), where a permanent shift in hearing sensitivity occurs at certain frequencies and is assumed to be irreversible; or TTS which is a temporary reduction in hearing sensitivity at certain frequencies.

Neither PTS or TTS are analogous to complete deafness and will only likely result in significant biological effects when the shift in sensitivity occurs within the most sensitive hearing range, at a level where an animal can no longer rely on hearing for communication, orientation in its environment and navigation. More commonly, PTS/TTS manifests as a “notch” in hearing sensitivity in part of the hearing range which may fall within or outside the most biologically important frequencies.

The level of injury is calculated based on defined thresholds for each functional hearing group (Table 4-8). The PTS-onset impact ranges are calculated for unweighted peak Sound Pressure Level SPLpeak, now commonly referred to as $L_{p,pk}$), which is a measure of sound intensity from a single pulse causing instantaneous PTS, and cumulative Sound Exposure Level (SEL, now commonly referred to as $L_{E,p}$), which is a metric of the combined total of sound exposure over a standard time period (defined here as 24 hours). The sound generated during construction, including cable laying, vessel sound, rock dumping, and trenching, is considered non-impulsive (of continuous nature). Therefore, the criteria for construction sound only considers cumulative SEL (LE,p) for PTS and TTS (Table 4-9), rather than the peak pressure levels more relevant to impulsive sound sources.

Table 4-9 Cumulative SEL ($L_{E,p}$) criteria for non-impulsive sound (Southall, et al., 2019)

Hearing group	Species	LE,p (dB re 1 µPa²s)	
		Cumulative PTS	Cumulative TTS
HF Cetaceans	Bottlenose dolphin	198	178
VHF Cetaceans	Including harbour porpoise	173	153
PCW	Harbour seal, grey seal	201	181

Underwater sound propagation modelling was undertaken by Subacoustech (2024) to determine impact ranges of construction activities that may injure marine mammals, including rock placement, trenching, and cable laying. The non-impulsive sound criteria (Southall et al., 2019) were used to account for the different hearing sensitivities of each marine mammal group due to the low source levels associated with each activity. A comparison of the estimated unweighted (i.e. without consideration of the frequency-dependent hearing sensitivity of each hearing group) source levels for the different construction sound sources is provided in Table 4-10. The modelling approach, while accurate and appropriate for the modelled sound sources, assumes that the animal remains stationary for 24 hours in relation to the sound source due to the low sound levels generated by the activities and it therefore cannot be assumed that the animal would swim away, which is considered highly precautionary and extremely unlikely.

Table 4-10 Estimated unweighted source levels for construction sound activities (Appendix 11; Subacoustech, 2024)

Sound source	Estimated Unweighted Source Level dB re 1 µPa @ 1 m (RMS)	Notes
Cable laying	171	Based on 11 datasets from a pipe laying vessel measuring 300 m in length; this is considered a loudest sound source for cable laying operations.
Rock placement	172	Based on four datasets from rock placement vessel '*Rollingstone*'.
Trenching	172	Based on three datasets of measurements from trenching vessels more than 100 m in length.
Vessel sound (large)	168	Based on five datasets of large vessels including container ships, FPSOs and other vessels more than 100 m in length. Vessel speed assumed as 10 knots.
Vessel sound (medium)	161	Based on three datasets of moderate sized vessels less than 100 m in length. Vessel speed assumed as 10 knots.

The greatest modelled impact range for injury to a stationary animal during rock placement and trenching occurs where an individual of the VHF cetaceans group (i.e. harbour porpoise) must remain within 900 m of the activity for 24 hours to experience PTS. Impacts on PCW cetaceans and HF marine mammals will be less. The largest impact range for TTS was 13 km, based on 24-hour exposure for VHF cetaceans during rock placement. This model assumes that the animal remains stationary for 24 hours, which is highly precautionary and extremely unlikely to occur. Overall, the effect is expected to occur over a highly localised extent, with a small part of the Offshore Site affected at any one time. Activities during the construction phase are considered to cause a short-term effect, that occurs intermittently, at a low frequency and intensity. It is not expected to have a significant effect on the conservation status or integrity of marine mammal receptors, causing a minor shift to baseline conditions which will cease following completion of construction activities. As such, the effect is defined as being of low magnitude.

The sound generated from these types of activity is unlikely to cause any damage to marine mammal auditory systems, as non-piling construction activities are generally below 1 kilohertz (kHz) (Todd *et al.,* 2015), where the hearing sensitivity for most marine mammal receptors is low. The sensitivity of harbour porpoise, dolphins and pinnipeds is relatively poor below 1 kHz (Table 4-8), meaning that they are less susceptible to auditory effects of sound exposure at frequencies below 1 kHz and a PTS at this frequency would not be likely to impact vital rates, and therefore, would have no effect at the population level. Therefore, harbour porpoise, dolphins, and pinnipeds are assessed to be of low sensitivity.

Prior to mitigation, the risk of injury on harbour porpoise, dolphins and pinnipeds resulting from construction sound is assessed as a not significant. Injury will however be fully mitigated during activities generating high amplitude sounds detailed in Table 4-10 through the strict implementation of the mitigation measures:

- Marine mammal monitoring using a qualified MMO to monitor marine mammals and log all relevant events. The MMO will carry out visual observations before the soft-start commences and will recommend delays in the commencement of site investigations should any species be detected;
- A mitigation zone of 1,000 m around the UHRS sound source and a 500 m radial distance around the SBP sound source will be used. Should any marine mammal species be detected within the monitored zone, the acoustic survey will not commence until the animals have moved out of the relevant mitigation zone or the transit of the survey vessel takes it away from them;
- A soft start (i.e. a gradual ramping up of power over time) will be conducted to give any marine mammals adequate time to leave the area;
- Where the duration of a survey line or station change is greater than 40 minutes, the activity will, on completion of the line/station being surveyed, either cease or undergo a reduction in energy output to a lower state;
- If there is a break in sound output for a period of 5-10 minutes, MMO monitoring will be undertaken to check that no marine mammals are observed within the Monitoring Zone;
- Reporting by the MMO will follow standard guidance (DAHG, 2014) and will be completed within 30 days of completion of any geophysical survey activity; and
- Project vessels will be moving at a maximum speed of approximately 5 knots during surveys to allow marine mammal species to move away from vessels.

Due to the temporary nature of the works and considering the habitat of marine mammals is widespread within the northeast Atlantic and around the UK as a whole, significant effects due to construction sound are not anticipated at this geographical scale during the construction of the proposed Project. Additionally, the modelled impact ranges assume an individual remains stationary for 24 hours which is highly unlikely due to the transient and intermittent nature of the sound, the high mobility of marine mammals, and in most cases, the transient (mobile) nature of the source.

Following the strict implementation of mitigation measures in line with the NPWS (2014) guidelines, construction noise will not injure any marine mammals and as such the activity will have **no adverse effect on the populations of the marine mammal QI of the Inishmore Island SAC, Kilkieran Bay and Islands SAC, Lower River Shannon SAC, Slyne Head Peninsula SAC, Slyne Head Islands SAC, West Connacht Coast SAC, Galway Bay Complex SAC, Blasket Islands SAC and Duvillaun Islands SAC, or any other SAC with marine mammal QIs at a greater distance from the Offshore Site, resulting from the Project alone.**

4.1.3.4 Disturbance to marine mammals from construction sound

Underwater sound can result in a behavioural response, which will depend on factors such as species, individual, time of year, and the type of activity being carried out. Limited data is available on the impacts of behavioural disturbance from non-piling construction activities. The sound generated by cable laying, vessel sound, rock dumping and trenching are considered continuous. The estimated impact range of disturbance related to construction sound (Table 4-11) was modelled using the NOAA

(2005) criteria for behavioural disturbance for a continuous sound source (Subacoustech, 2024), defined as a threshold of 120 dB (NMFS, 2018).

Table 4-11 Impact ranges related to construction sound using the NOAA (2005) criteria for behavioural disturbance on marine mammals, using the $L_{p,\ RMS}$ metric

Activity	Estimated impact range (m)
Cable laying	8,400
Trenching	6,400
Rock placement	9,100

Rock placement was identified as producing the greatest disturbance impact range, predicting that marine mammals will experience behavioural disturbance if they are within 9.1 km of the activity. Specific information on the effects of non-piling activities is limited, as non-piling construction activities generally tend to be confounded with the presence of vessels which also cause displacement of marine mammals due to acoustic disturbance, and these effects are thus difficult to separate (Anderwald *et al.*, 2013; Todd, *et al.,* 2015). The effect of non-piling construction activities is not well studied, as most studies focus on the impacts of piling which would have a more significant noise impact than the activities used during the Project. The available literature suggests that displacement due to construction activities anticipated at the Offshore Site is likely to occur on a small spatial scale and will be of temporary nature. For example, studies on the effect of dredging sound show that harbour porpoises and harbour seals experience no risk of incurring auditory injury (e.g. PTS) and estimate that behavioural avoidance can occur between 400 m – 5 km (McQueen *et al.,* 2020). These estimates were highly conservative and concluded that behavioural avoidance by harbour porpoise was not considered significant. For harbour porpoise, monitored during the construction and installation of the Beatrice and Moray East OWFs (excluding piling), occurrence decreased by up to 17% although individuals were still regularly detected throughout the construction period (Benhemma-Le Gall *et al.*, 2021). Once animals moved away from the source of disturbance, they appeared to resume normal behavioural activities, showing an ability to compensate for disturbance. Overall, the effect is expected to occur intermittently, over a local extent, with a small part of the ZoI affected.

Studies on harbour seals have shown that no significant displacement occurs during the construction of a wind farm, apart from during piling activities, with seal distribution returning to normal after two hours from piling cessation (Russell *et al.*, 2016). Modelling carried out for Moray East, an OWF in the Moray Firth, Scotland, assessed the potential for disturbance to marine mammals due to various types of construction activities. It was predicted that for a sound threshold initiating a strong avoidance reaction, impact ranges varied from 220 m for cable laying, 550 m for rock placement, 640 m for trenching, and 200 m for vessel-related sound (Moray Offshore Renewables Ltd., 2012). Culloch *et al.* (2016) assessed the effects of construction-related activities and vessel traffic related to the construction of a pipeline in northwest Ireland and suggested that minke whale and harbour porpoise were influenced by construction-related activities, but no evidence of impacts on common dolphins were detected. Conversely, vessel presence reduced common dolphin occurrence, while that had no effect on harbour porpoise.

The construction phase is considered to cause a short-term effect, that occurs at a low frequency and intensity. It is not expected to have a significant effect on the conservation status or integrity of marine mammal receptors, causing a minor shift to baseline conditions which will cease following completion of construction activities. As such, the effect is defined as being of low magnitude.

Considering the capacity of cetaceans to tolerate temporary disturbance or displacement given their mobility, and the results from the above studies across multiple species showing a capacity to compensate for any short-term local disturbance, all relevant species of cetaceans are assessed to be of low sensitivity to construction activities.

Based on the monitoring of seal disturbance at OWFs (Russell *et al.*, 2016) showing no displacement effects, and the capacity of seals to return to the area following disturbance, grey and harbour seals are assessed to be of negligible sensitivity. Prior to mitigation, disturbance resulting from construction sound is assessed as insignificant.

The risk of disturbance will however be mitigated through the strict implementation of the Marine Mammal Mitigation Protocol which contains mitigation measures including:

- Acoustic Deterrent Devices (ADD), devices to temporarily displace animals away from the highest risk (injury) zones;
- Marine Mammal Observers (MMO), to ensure that there are no marine mammals in close proximity (1,000 metres) of the UXO being cleared;
- Pre-search, in which MMOs will conduct a pre-search over the mitigation zone for 60 minutes and will continue throughout UXO clearance activities in line with NPWS (2014) and draft JNCC (2024) guidelines;
- Post-search, conducted for a minimum of 20 minutes to record any notable information, including in the event of instances of injury or death of marine life including fish;
- Measures in the event of a misfire; and
- Measures in the event of an unexpected delay.

The NPWS guidelines state that activities including drilling, seismic surveys, geophysical surveys and pile driving will be appropriately managed through:

1. Risk identification:
2. Risk assessment; and
3. Risk management

Due to the temporary nature of the works and the use of GBS which removes the effect of sound from piling, and considering the habitat of marine mammals is widespread within the northeast Atlantic as a whole, significant effects due to disturbance from construction sound are not anticipated at this geographical scale during the construction at the Offshore Site. Additionally, the modelled impact ranges assume an individual remains stationary for 24 hours which is highly unlikely due to the transient and intermittent nature of the sound, and the high mobility of marine mammals.

With adherence to the above mentioned mitigation, the construction noise will not disturb any marine mammals and as such the activity will have **no adverse effect on the populations of the marine mammal QI of the Inishmore Island SAC, Kilkieran Bay and Islands SAC, Lower River Shannon SAC, Slyne Head Peninsula SAC, Slyne Head Islands SAC, West Connacht Coast SAC, Galway Bay Complex SAC, Blasket Islands SAC and Duvillaun Islands SAC, or any other SAC with marine mammal QIs at a greater distance from the Offshore Site, resulting from the Project alone**.

4.1.3.5 Injury to marine mammals from UXO clearance

UXO clearance may be required prior to construction of the Project, during which an underwater explosion will generate an acoustic pulse of very high peak pressure (an impulsive sound) potentially causing injury (as PTS-onset) to marine mammals. As described in Section 4.1.3.3, PTS-onset impact ranges are calculated for an unweighted peak SPL ($L_{p,pk}$) and a cumulative SEL ($L_{E,p}$). $L_{p,pk}$ is calculated as an unweighted sound level, meaning the sound levels have not been adjusted in any way. $L_{E,p}$ is calculated as a weighted sound level, accounting for the hearing ability of different species. The frequency-weighted $L_{E,p}$ takes into account the hearing sensitivity of different groups of marine mammals (i.e. LF, HF, VHF cetaceans; phocid carnivores (seals) in water) and the duration of the sound exposure. PTS-onset ranges for UXO clearance are calculated for $L_{p,pk}$, assuming that UXO detonation is defined as an impulsive and single-pulse source.

Sound levels during UXO clearance are affected by multiple factors, including the charge weight (total size of explosive material being detonated), design, age, burial depth etc. The modelling has only considered the charge weight as the variable in its assessment, and no sound mitigation has been included. Should UXO clearance be required, the scenario with the greatest risk for injury would be a high-order detonation, where all explosive materials in the UXO are completely detonated. The modelled maximum largest charge weight for potential UXO items that may be present in the Project area was 800 kg, in addition to a smaller donor charge of 0.5 kg used to initiate the detonation.

However, it must be reiterated that the risk of UXO being discovered (based on preliminary assessment and surveys undertaken to date) has been assessed as being extremely low, and even if subsequently any UXO were discovered, the primary means of mitigation will be to avoid clearance *in situ*. Based on the risk assessment presented here, it is anticipated that a Regulation 54 (European Communities (Birds and Natural Habitats) Regulations 2011) derogation licence (to injure/disturb Annex IV species) will not be required. However, if any UXO are discovered which cannot be avoided or relocated, then clearance through low-noise methods, e.g. low order deflagration, is the preferred method to minimise sound emissions, and the requirement for a derogation licence will be reconsidered.

The assessment for injury and disturbance from UXO clearance to marine mammals from all hearing groups is presented in the Underwater Modelling and Assessment report (Appendix 11; Subacoustech, 2024). The PTS impact ranges for an impulsive source as a result of UXO clearance are presented in Table 4-12.

Table 4-12 Estimated PTS impact ranges for high order detonation (800 kg charge weight) for relevant marine mammal species using the impulsive, unweighted $L_{p,pk}$ and Weighted $L_{E,p}$ sound criteria from Southall et al. (2019)

Hearing group	Species	Range (km)	
		Unweighted $L_{p,pk}$	Weighted $L_{E,p}$
HF	Common dolphin, bottlenose dolphin	0.84	0.07
VHF	Harbour porpoise	14	1.6
PCW	Harbour seal, grey seal	2.8	2

Should high-order detonation be required, the largest impulsive impact ranges calculated are for VHF cetaceans, where the animal must be within 14 km of an 800 kg charge weight UXO detonation to experience PTS (using the unweighted $L_{p,pk}$ criteria). This assumes that the sound source remains impulsive throughout the entire impact range. When accounting for marine mammal hearing sensitivities (weighted $L_{E,p}$), the highest PTS impact range is predicted for PWC cetaceans within 2.8 km of the UXO detonation. When using non-impulsive thresholds, the blast wave is assumed to become non-impulsive at a distance further than 3.5 km (Hastie *et al.,* 2019), such that the largest impact range with a potential for PTS is a maximum of 3.5 km.

Overall, the effect is expected to occur over a maximum extent of 3.5 km from the sound source, affecting a part of the ZoI. This effect is expected to be instantaneous, occurring at a low frequency and only prior to or during construction. It is however unlikely any UXO clearance will be required during the Project. This effect is therefore considered to be of medium magnitude.

Based on the estimated impact ranges for high-order UXO detonation, harbour porpoise would be the most impacted by high-order detonation. The effect is considered to be of very high intensity when considering a high-order detonation, which can lead to injury or death of marine mammals. Controlled explosions generate relatively low frequency sound (< 1kHz; von Benda-Beckmann *et al.*, 2015), with most of the energy being below the sensitivity of harbour porpoise, dolphin and pinnipeds, meaning that they are less susceptible to auditory effects of sound exposure at frequencies below 1 kHz and a

PTS at this frequency would not be likely to impact vital rates, and therefore, would have no effect at the population level. Therefore, all marine mammals are assessed to be of medium sensitivity.

Prior to mitigation, effects on harbour porpoise, dolphin and pinnipeds are assessed as a moderate negative effect. Initial investigations during pre-construction surveys were conducted to identify potential UXO that may require investigation, in order to avoid, remove, or potentially detonate them. The surveys did not identify any UXO across the Offshore Site, therefore it is not expected that any UXO will require clearance.

In the unlikely event where UXO clearance will be required, high-order clearance is the least preferred method, and all efforts will be made to avoid it. Low order deflagration will be the preferred clearance method used, where clearance of any size of UXO is done using a special donor charge of 0.5 kg which vaporises the explosive material without explosion.

Appendix 12: MMMP will be strictly adhered to during both low-order and high-order UXO clearance. This MMMP contains mitigation measures including:

- ADD to temporarily displace animals away from the highest risk (injury) zones;
- MMOs to ensure that there are no marine mammals in close proximity (1,000 metres) of the UXO being cleared;
- Pre-search, in which MMOs will conduct a pre-search over the mitigation zone for 60 minutes and will continue throughout UXO clearance activities in line with NPWS (2014) and draft JNCC (2024) guidelines;
- Post-search, conducted for a minimum of 20 minutes to record any notable information, including in the event of instances of injury or death of marine life including fish;
- Measures in the event of a misfire; and
- Measures in the event of an unexpected delay.

The largest impact range (PTS) for a low order deflagration is 1.2 km for VHF cetaceans (i.e. harbour porpoise), and <240 m for all other hearing groups. While potential injury from UXO clearance is a permanent change in the hearing threshold of animals with no recovery, a very low number of animals are predicted to be affected based on the densities of species in the area and the mitigation. Based on the high mobility of marine mammals, which will likely move away from the clearance vessels, individuals are not expected to remain in the vicinity of the area. Additionally, MMOs employed on the vessels will ensure that there are no marine mammal receptors in the vicinity prior to the start of the operation. The effect is momentary during clearance (only expected to last a few seconds) and will be localised. Considering the unlikely presence of UXO within the Offshore Site, significant effects due to UXO clearance are not expected when considering mitigation. **With adherence to the above mentioned mitigation, a very low number of mammals are anticipated to be affected for a short time, and as such the activity will have no adverse effect on the populations of the marine mammal QI of the Inishmore Island SAC, Kilkieran Bay and Islands SAC, Lower River Shannon SAC, Slyne Head Peninsula SAC, Slyne Head Islands SAC, West Connacht Coast SAC, Galway Bay Complex SAC, Blasket Islands SAC and Duvillaun Islands SAC, or any other SAC with marine mammal QIs at a greater distance from the Offshore Site, resulting from the Project alone.**

4.1.3.6 Disturbance to marine mammals from UXO clearance

4.1.3.6.1 *Description of effect*

The sound generated from UXO clearance has the potential to cause a behavioural response from marine mammals. There is limited evidence on the behavioural response of marine mammals to sound generated by UXO clearance. Because an underwater explosion is a momentary effect, whereby elevated sound pressure levels only persist for one or two seconds, it is not likely that this elicits any more than an immediate startle response in marine mammals, as opposed to a disturbance effect lasting several hours. TTS ranges are used as a suitable proxy to assess behavioural disturbance from UXO sound as the sound source is a single impulsive source (Sinclair *et al.,* 2023). Behavioural disturbance was therefore calculated using unweighted $L_{p,pk}$ and weighted $L_{E,p}$ impact ranges for TTS-onset (Table 4-13).

Table 4-13 Estimated TTS impact ranges for high order detonation (800 kg charge weight) for relevant marine mammal species using the impulsive, unweighted $L_{p,pk}$ and Weighted $L_{E,p}$ sound criteria from Southall et al. (2019)

Hearing group	Species	Range (km)	
		Unweighted $L_{p,pk}$	Weighted $L_{E,p}$
LF	Minke whale	4.7	120
HF	Bottlenose dolphin	1.5	0.62
VHF	Harbour porpoise	26	4.2
PCW	Harbour seal, grey seal	5.3	23

Should high-order detonation be required, the largest impact ranges (based on weighted $L_{E,p}$) calculated are for LF cetaceans, where there is the potential for disturbance for up to 120 km of the UXO for a charge weight of 800 kg. This assumes that the sound source remains impulsive throughout the entire impact range, which is not the case as pulsed sounds become less impulsive with increasing distance (Hastie *et al.*, 2019). When using non-impulsive thresholds, the pressure wave is assumed to lose impulsive characteristics at a distance >3.5 km (Hastie *et al.,* 2019), such that the largest impact range with a potential for TTS is a maximum of 3.5 km. This effect is expected to be instantaneous but will not lead to injury or death of marine mammals. This effect is therefore considered to be of low magnitude.

JNCC guidance (JNCC, 2020) states that a one-off explosion is unlikely to cause widespread and prolonged displacement, and rather only elicit a startle response. Therefore, it is not expected that disturbance would result in any changes to the vital rates of individuals in a population. The sensitivity of all marine mammals is therefore expected to be negligible.

Initial investigations ahead of geotechnical surveys were conducted to identify potential UXO that may require investigation, in order to avoid, remove, or potentially detonate them. The surveys did not identify any UXO at the proposed infrastructure locations within the Offshore Site, therefore it is not expected that any UXO will require detonation.

In the unlikely event where UXO clearance will be required, high-order clearance is the least preferred method, and all efforts will be made to avoid it. Low order deflagration will be the preferred clearance method used, where clearance of any size of UXO is done using a special donor charge of 0.5 kg which vaporises the explosive material without explosion.

Appendix 12: MMMP will be strictly adhered to during both low-order and high-order UXO clearance. This MMMP contains mitigation measures including:

- ADD to temporarily displace animals away from the highest risk (injury) zones;
- MMOs to ensure that there are no marine mammals in close proximity (1,000 metres) of the UXO being cleared;
- Pre-search, in which MMOs will conduct a pre-search over the mitigation zone for 60 minutes and will continue throughout UXO clearance activities in line with NPWS (2014) and draft JNCC (2024) guidelines;

- Post-search, conducted for a minimum of 20 minutes to record any notable information, including in the event of instances of injury or death of marine life including fish;
- Measures in the event of a misfire; and
- Measures in the event of an unexpected delay.

Should low-order deflagration be utilised, a very low number of animals are predicted to be affected based on the densities of species in the area and the mitigation. MMOs employed on the vessels will ensure that there are no marine mammal receptors in the vicinity prior to the start of the operation. The effect is temporary during clearance (only expected to last a few seconds) and will be localised. Considering the unlikely presence of UXO within the Offshore Site, significant effects from disturbance due to UXO clearance are not expected when considering mitigation. **With adherence to the above mentioned mitigation, the UXO clearance noise will not disturb marine mammals and as such the activity will not have no adverse effect on the populations of the marine mammal QI of the Inishmore Island SAC, Kilkieran Bay and Islands SAC, Lower River Shannon SAC, Slyne Head Peninsula SAC, Slyne Head Islands SAC, West Connacht Coast SAC, Galway Bay Complex SAC, Blasket Islands SAC and Duvillaun Islands SAC, or any other SAC with marine mammal QIs at a greater distance from the Offshore Site, resulting from the Project alone.**

4.1.3.7 Disturbance due to the physical presence of construction vessels

During the construction phase, there will be an increase in vessel traffic associated with the Project, which could result in an increased risk of disturbance from marine sound and barrier effects to marine mammals through avoidance and displacement, as well as potential behavioural changes. It is very difficult to separate disturbance caused by vessel presence from vessel sound as both of these impacts occur simultaneously, and many studies do not differentiate between these two effects (Erbe *et al.*, 2019). As such, vessel sound will be included in the impact assessment.

Disturbance from the physical presence of vessels around the Offshore Site will have a likely, short-term adverse effects on marine mammals. There will be a maximum of 23 vessels associated with the pre-construction and construction phases of the Offshore Site, of which up to 11 will be present within the Offshore Site at any one time. The effect will be short-term (up to 4 years) and will cease following the completion of construction activities. Overall, the effect of vessel sound is expected to occur over a local extent within a small part of the ZoI, mostly around the OAA and short-term along the OECC (up to 16 months for cable installation). The magnitude of this effect is therefore negligible.

Cetaceans are vulnerable to shipping sound as they rely on sound for communication, navigation and foraging, and as such have evolved high auditory sensitivity. Vessel sound can mask communication between individuals and can increase stress, which can impact behaviour, including foraging, migration and reproduction. Vessel presence can alter the behaviour of marine mammals, such as interrupting feeding, resting and socialising (Christiansen & Lusseau, 2015; Meissner *et al.,* 2015; Marley *et al.,* 2017). However, studies have shown that while cetaceans will experience behavioural disruptions due to boat presence, there were no long-term impacts on foetal growth, meaning that the biological significance of vessel disturbance on populations is low (Christiansen & Lusseau, 2015; Christiansen *et al.,* 2015). Culloch *et al.* (2016) assessed the effects of vessel traffic on marine mammals during the construction of a pipeline in northwest Ireland. Evidence suggests that vessel presence reduced common dolphin occurrence, while it had no impact on harbour porpoise. Marine mammal activity generally recovers to baseline construction following turbine installations even with pile driving, which means that the disturbance effect from vessel sound is negligible. Therefore, all cetacean species apart from harbour porpoise have been assessed to be of low sensitivity to disturbance from vessels.

Windfarm specific studies have found that found that porpoise displacement due to construction vessel presence was observed for up to 4 km (Benhemma-Le Gall *et al.*, 2021). Presence of other types of vessels have also been shown to provoke behavioural changes (Dyndo *et al.*, 2015; Oakley *et al.*, 2017;

Wisniewska *et al.,* 2018), even when vessels are at 1 km away (Dyndo *et al.,* 2015). As such, harbour porpoise have been assessed to be of medium sensitivity to disturbance from vessels.

Vessels may disturb seals both in the water and at haul out sites. The closest SAC with pinniped designated features is the Kilkieran Bay and Islands SAC (1.4 km away from Project), which is designated for harbour seals. Vessels are unlikely to approach the SAC and as such, there are no anticipated significant effects on seals at breeding locations within this protected site (>5km from the Offshore Site). Seals may be present within the Offshore Site area to forage, and as such are at risk of being disrupted during foraging and travelling to and from haul out sites, which may lead to avoidance of foraging grounds. Biologically significant effects may occur through auditory masking, as seal vocalisations, which play a role in harbour seal reproduction, overlap in frequency with shipping sound (Hanggi & Schusterman, 1994; Van Parijs *et al.,* 2000). Seals do not show extreme displacement in response to high vessel numbers, and rather show slight avoidance behaviours based on increased vessel sound (Anderwald *et al.,* 2013). Additionally, exposure to shipping in isolation has not shown to cause declines in seal populations, where seal colonies in areas with low levels of shipping have shown declines in counts, whereas areas with high intensities of vessel traffics have increasing harbour seal populations (Duck & Morris, 2016). Therefore, seals have been assessed to be of low sensitivity to disturbance from vessels.

The GBS foundations of the WTGs will be delivered and temporarily anchored at a location potentially in the vicinity of the Shannon Foynes port located within the Shannon Estuary prior to being transported to the OAA for installation (Appropriate Assessment Screening Report and its appendices, attached here as Appendix 1). The temporary anchorage area is separated into two areas: the float-off location, where the GBS foundations will be removed from the semi-submersible heavy transport vessel (HTV) which transports three GBSs at a time, and the area where the GBS foundations will be temporarily stored until transported to the site. The temporary anchorage will be subject to a separate licensing process which will consider the effects in more detail, however as it is part of the Project, a high-level assessment of the consideration of effects is presented here. These effects are principally the vessel movements associated with transport of GBS foundations to and from the temporary anchorage location.

The potential location for temporary anchorage of GBS foundations may be within the Lower River Shannon SAC, designated for the protection of bottlenose dolphin as it contains a distinct and localised population within Ireland. This forms a precautionary basis for this assessment due to the presence of this highly protected population. The vessels used during temporary anchorage operations may cause temporary disturbance of bottlenose dolphin, which are also a qualifying interested of the Lower River Shannon SAC as they are present along the coastline. All qualifying interests of the Lower Shannon River SAC must be maintained at favourable conservation status, including bottlenose dolphins and otters (NPWS, 2012a). that do not adversely affect the bottlenose dolphin population at the site.

One semi-submersible HTV will transport the GBS foundations from the manufacturing point to the temporary anchorage area and will be moored at the designated float-off area inside the Shannon Estuary. The semi-submersible HTV can carry up to three GBS foundations per voyage, with a total of 31 GBS foundations to be stored, which equates to 11 voyages, although not all will need to be stored at the same time as they will be towed to the OAA for deployment as soon as the weather and other conditions allow.

Preparatory work is required within the temporary anchorage area. The GBS foundations will be transported to the temporary anchorage area by a HTV which will temporarily be held in position before the GBS foundations are floated off by two tug boats to be moored at a designated location. The total float-off operation for one HTV carrying three GBS foundations at a time, including all preparatory and completion works, is estimated to have a duration of approximately three working days.

Disturbance from the physical presence of vessels around the Lower River Shannon SAC will have a likely, temporary adverse effect on marine mammals and otters. Vessel traffic (passenger, cargo and other vessel activities) within the Study Area forms part of the existing baseline. The Shannon estuary is used by approximately 830 ships per year (Shannon Foynes Port Company, 2021), with 431 vessels arriving at Shannon Foynes in 2022 (Central Statistics Office, 2023), such that the additional vessels present during the temporary anchorage period would have an imperceptible effect on baseline conditions. The effect will be temporary as works will occur over a total of several days and will occur rarely, and cease following the completion of construction activities. Overall, the effect of vessel sound is expected to occur over a local extent within a small part of the Lower River Shannon SAC and is temporary and occurs rarely. The magnitude of this effect is therefore negligible.

The population of bottlenose dolphin within the Lower River Shannon SAC is of regional conservation importance as a designated species. The population within the SAC has also been observed up to 30 km away from the estuary, showing the high mobility of the population. Studies have shown dolphins are present in the vicinity of the Port of Shannon-Foynes for approximately 40% of days monitored (O'Brien *et al.,* 2013; Carmen *et al.*, 2021), with much higher presence (~70%) towards the mouth of the estuary. However, dolphins tend to spend more time foraging towards the mid estuary (near Shannon Foynes) than the mouth of the estuary (Carmen *et al.,* 2021), meaning that there are differences in habitat variability and use within the Shannon Estuary and the bottlenose dolphins show habitat flexibility within the estuary. Although dolphins may be foraging near to the temporary anchorage area, Carmen, *et al.* (2021) suggested that the presence of ships was not a significant deterrent to dolphin presence. As such, based on this evidence and the conservation status of this population, bottlenose dolphin are considered to be of medium sensitivity to the physical presence of vessels within the Shannon Estuary.

Prior to mitigation, disturbance due to the physical presence of vessels within the Offshore Site on harbour porpoise is insignificant. The effect of disturbance due to the physical presence on all other marine mammal species is likely to have an imperceptible effect. Vessel movements will however be managed in a way that will mitigate the negative effects to marine mammals. These measures are described in detail in Appendix 13: Vessel Management Plan, including:

- Vessels engaged in construction works will typically be travelling at slow (<6 kts) speeds. This will reduce sound emissions relative to high-speed transiting and reduce the underwater sound effects associated with vessel sounds; and
- Vessels will follow prescribed routes (non-random movement).

With adherence to the above mentioned mitigation, construction vessel presence will not disturb marine mammals and as such the activity will not have no adverse effect on the populations of the marine mammal QI of the Inishmore Island SAC, Kilkieran Bay and Islands SAC, Lower River Shannon SAC, Slyne Head Peninsula SAC, Slyne Head Islands SAC, West Connacht Coast SAC, Galway Bay Complex SAC, Blasket Islands SAC and Duvillaun Islands SAC, or any other SAC with marine mammal QIs at a greater distance from the Offshore Site, resulting from the Project alone.

4.1.3.8 In combination effects on European Sites with marine mammal QI

Potential effects from the Offshore Site may interact with those from other projects (developments), plans and activities, resulting in in combination effects on marine mammal QI. As detailed in Section 1.4.4, No plans were identified that could contribute to any in-combination effects with the Offshore Site of the Project. As such, only projects that could potentially lead to in-combination impacts were considered further.

The general approach to the in-combination effects assessment is described in Section 1.4.3. A 50 km buffer has been defined in consideration of the spatial distribution of marine mammal and other megafauna populations, both within the Offshore Site and in wider regional waters around the west of Ireland. Marine mammals and other megafauna are mobile species, and it is considered that this 50 km buffer will capture projects which have the potential to result in direct effects on marine megafauna species (e.g. injury and/or disturbance to marine mammals due to the influence of any anthropogenic underwater sound) and which have the potential to result in indirect impacts to marine mammals and other megafauna (i.e., through impacts to prey species). It is considered that this study area will encompass all in combination projects and developments which have the potential for connectivity with the Offshore Site and associated construction, operation and maintenance and decommissioning activities occurring within the offshore site and adjacent waters. Additionally, the Shannon Estuary has been considered as part of the in-combination assessment in consideration of the potential temporary anchorage and associated movement of Project vessels within the estuary. The list of relevant developments for consideration within the in-combination effects assessment is outlined in Table 4-14.

It is important to note that there are no developments of an equivalent scale or type to the Project within the region. To date, there have been few large-scale construction developments on the west coast of Ireland generally. Therefore, many of the relevant developments in Table 4-14 represent short-term, localised activities which are not generally associated with any long-term infrastructure presence.

The Project is the only Relevant Project / Phase 1 offshore renewable development in the region with a Maritime Area Consent (MAC), the only offshore wind development in the region which was successful in Offshore Renewable Electricity Support Scheme (ORESS) 1 and the only offshore wind development in the region, which is permitted to make a planning application.

A number of planned offshore renewable developments (at various levels of inception) were proposed to be developed off the western coast of Ireland before the State's policy changed to a plan-led regime. Current policy is such that none of these projects are permitted to seek a MAC or make a planning application. However, whether any of them may progress in the future is entirely dependent on future policy decisions. Several foreshore licence applications have been made, primarily in relation to environmental surveys in support of these renewables developments. Given that Government policy precludes these proposals from proceeding, in that context, it is not appropriate or necessary to assess the effects of the surveys the subject of the foreshore licence applications for these project proposals in combination with the Project.

Consequently, all Foreshore Licences applications for previously planned survey investigations for offshore energy developments have been excluded from the in-combination effects assessment.

There are 97 aquaculture sites within 50 km of the Offshore Site, with 74 of those licenced for shellfish production. The remaining 23 aquaculture sites are licenced for finfish production. The closest aquaculture site (the Udaras na Gaeltachta site) is located 6.3 km from the OAA. The nature of these developments is such that their associated impacts are universal between sites. These sites are considered part of the baseline environment and, though they remain present within 50 km of the Offshore Site, any discharge and deposit detritus/sediment which could result in increased SSC will be minimal allowing for rapid reincorporation of sediments into the local transport regime and is therefore unlikely to result in in combination SSC impacts on marine mammal receptors. Therefore, there is no opportunity for significant in combination effects together with the impacts associated with the Project. Consequently, aquaculture sites are excluded from in combination effects assessment.

A number of wave buoys, navigation buoys, and sea temperature probes are located within 50 km of the Offshore Site. These are grouped together given their similarities as small pieces of sea surface infrastructure. There are 14 navigational buoys within 50 km of the Offshore Site, the closest of which is at Killeaney. This buoy is 15.36 km from the OECC. There are 15 sea temperature probes within 50 km of the Offshore Site. These probes occur at a high density amongst the islands along the coast of the mainland, northeast of the OAA. The closest probe was installed in Kilkieran Bay in 2004 and is 7.97 km from the OAA. There is a single (Westwave) wave buoy located 7.66 km due west of the Landfall location. These operational buoys are considered part of the baseline environment and, though they remain present within 50 km of the Offshore Site, they have no associated continuous operational impact on the environment. Therefore, there is no opportunity for significant in combination effects together with the impacts associated with the Project. Consequently, wave buoys, navigation buoys, and sea temperature probes are excluded from the in-combination effects assessment.

There are a number of ferry ports located within 50 km of the Offshore Site. However, these ports are operational and have no associated licenced maintenance or dredging activities. Consequently, it is assumed that these port locations do not generate any impacts that have the potential to result in in combination effects with the Project due to being included in the Project baseline. Ferry ports are therefore not considered further within the in-combination effects assessment.

Urban waste water treatment locations are located along the coast within 50 km of the Offshore Site, in particular close proximity to the Landfall. As these locations are all terrestrial and are concerned with treatment activities which occur onshore, these waste water treatment locations are not considered further in the in-combination effects assessment. However, some water treatments are co-located with discharge points which do discharge waste water effluent directly from the coast or into estuaries. These discharge points, and others along the coast which output potential pollutants directly into coastal or estuary waters are considered further in the in-combination effects assessment.

Two operational wave test sites are located within 50 km of the Offshore Site. These sites are considered part of the baseline environment and, though they remain present within 50 km of the Offshore Site, they have no associated continuous operational impact on the environment. Therefore, there is no opportunity for significant in combination effects together with the impacts associated with the Offshore Site. Consequently, operational wave test sites are excluded from the in-combination effects assessment.

The nearest licenced dumping at sea activities occur as part of maintenance dredging associated with the Kilrush Marina, located within the Shannon Estuary. Vessels associated with the dumping at sea activities may have an in-combination effect with the vessels associated with the Project. Therefore, licenced dumping at sea is considered within the in-combination effects assessment.

The list of relevant developments for inclusion within the in-combination effects assessment is outlined in Table 4-14.

Table 4-14 List of developments considered for the marine mammal in combination assessment

Location	Development Type	Development Name	Distance to OAA (km)	Distance to OECC (km)	Status	Additional Information	Considered further
Foreshore Licences							
Galway	Cable	IRIS sub-sea fibre optic cable system	0.00	71.87	Operational	Licence for Construction of Cable. 2022- overall duration 2-3 months	No – operational project is considered part of baseline conditions.
Galway	Scientific research	UCD Research Experiments, Inishmaan	13.12	28.21	Operational	Licence for Data Monitoring Equipment. 2022-2027.	No – operational project is considered part of baseline conditions.
Clare / Kerry	Cable	Eirgrid Cross Shannon Cable Project	21.54	80.04	Operational	Licence held for Construction of Cable. Duration of construction 12 months.	No – operational project is considered part of baseline conditions.
Dumping at Sea							
Shannon Estuary	Dredged material	Shannon Foynes Port Company	86.61	32.48	Permit valid through 31/12/2026	Permit No. S0009-03	No – Project activities will not overlap in time with this permit
Foynes Harbour	Dredged material	Shannon Foynes Port Company	88.85	34.89	Permit valid through 31/12/2026	Permit No. S0009-03	No – Project activities will not overlap in time with this permit
Discharge points							
Kilkee	Discharge Point	Kilkee	64.40	11.90	Active	Discharge in coastal water	No – there is no potential impact pathway associated with effects upon marine water quality, particularly due to any disturbed sediments affecting turbidity
Kilrush	Discharge Point	Kilrush	73.21	14.85	Active	Discharge in coastal water	No – there is no potential impact pathway associated with effects upon marine water quality, particularly due to any disturbed sediments affecting turbidity

Location	Development Type	Development Name	Distance to OAA (km)	Distance to OECC (km)	Status	Additional Information	Considered further
Ennistymon	Discharge Point	Ennistymon Waste Water Treatment Plant	53.16	25.99	Active	Discharge to estuary	No – estuaries typically experience naturally elevated levels of SSC such that any additional discharge will likely be readily incorporated into the local environment.
Clifden	Discharge Point	Clifden Waste Water Treatment Plant	21.37	26.79	Active	Discharge to estuary	No – estuaries typically experience naturally elevated levels of SSC such that any additional discharge will likely be readily incorporated into the local environment.

Based on the list of plans and projects considered for the marine mammal in-combination assessment (Table 4-14), a screening of potential impact pathways for construction, operational and decommissioning phase impacts has been undertaken as presented in Table 4-15 below with a justification of the process

Table 4-15 Screening of effects for the in-combination effects assessment

Effect	Screening	Justification
Construction		
Acoustic effects associated with construction	Out	The pathway for in-combination effects to be assessed is underwater noise from site investigation activities of the multiple projects. However, all projects are required to undertake their marine surveys in accordance with the mitigation and guidelines provided in the 'Guidance to Manage the Risk to Marine Mammals from Manmade Sound Sources in Irish Waters' (DAHG, 2014), and therefore it is highly unlikely that any in-combination injury or disturbance impacts from use of the geophysical survey equipment would have an adverse effect on conservation objectives of harbour porpoise, bottlenose dolphin, grey seal or harbour seal and there will be no adverse effect on the integrity of any European site. This is on the basis that the site investigation activities in-combination, when undertaken in accordance the 'Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters' (DAHG, 2014) will not impair the ability of any individual marine mammal to survive or reproduce.
Indirect effects of construction sound effects on the prey species of marine mammals	Out	
Impacts associated with effects upon marine water quality, particularly due to any disturbed sediments affecting turbidity	Out	Marine mammal QIs are considered to be highly mobile and wide ranging and therefore capable of moving away from any regions which experience turbidity associated with disturbed sediment. Furthermore given their adaptability and mobility, marine mammals will be able to find alternative foraging locations for prey. Considering there are no other developments of a scale which could impede the marine mammals ability to utilise other locations, there will be no in-combination effects associated with marine water quality.
Impacts associated with effects upon marine water quality due to any accidental release of pollutants	Out	Accidental release of pollutants are considered to be highly unlikely given the implementation of the mitigation measures including adherence to international regulations; however, as described above marine mammals are highly mobile and wide ranging and would be able to swim away from any potential spills. Given that there are no other developments of a scale which could impede the marine mammals ability to utilise other locations, there will be no in-combination effects associated with marine water quality.
Operation and maintenance		
Risk of injury due to collision of marine mammals with WTG foundations	Out	As described above all Foreshore Licence applications for site investigations for offshore energy developments have been excluded from the in-combination effects assessment. Therefore there is no potential for in-combination effects associated with risk or injury due to collision of marine mammals with WTG foundations.

Effect	Screening	Justification
Disturbance due to WTG operational sound	Out	As described above all Foreshore Licences for offshore energy developments have been excluded from the in-combination effects assessment, except for a single site investigation application for the Saoirse wave energy project which overlaps with the OECC. Therefore there is no potential for in-combination effects associated with disturbance due to WTG operational sound.
Displacement or barrier effects caused by the physical presence of WTG and associated infrastructure	Out	There are no other developments with permanent physical infrastructure in the region, as described above.
Disturbance due to the physical presence of vessels	Out	No potential for overlap between operation and maintenance phase and any other project.
Risk of injury resulting from collision of marine mammals with operation and maintenance vessels	Out	No potential for overlap between operation and maintenance phase and any other project.
Risk associated with electromagnetic fields (EMFs) emissions associated with subsea cabling	Out	No developments for future subsea cables are screened in.
Impacts associated with effects upon marine water quality due to any accidental release of pollutants	Out	No potential for overlap between operation and maintenance phase and any other project.
Habitat change, including the potential for change in foraging opportunities	Out	There are no other developments with permanent physical infrastructure in the region, as described above.
Decommissioning phase		
Acoustic effects associated with decommissioning	Out	The Project activities proposed during the decommissioning phase will result in residual effect levels the same as, or less than, those assessed for the construction phase of the Project. Therefore, there are no additional in combination considerations specific to the decommissioning phase. Also, there are no known plans or projects that will overlap with the decommissioning phase that have not been considered during in combination effects assessment for the construction phase. Consequently, decommissioning impacts are scoped out of the in-combination effects assessment.
Underwater decommissioning sound effects on the prey species of marine mammals	Out	
Disturbance due to the physical presence of vessels	Out	
Risk of injury resulting from collision of marine mammals with decommissioning vessels	Out	

Effect	Screening	Justification
Impacts associated with effects upon marine water quality, particularly due to any disturbed sediments affecting turbidity	Out	
Impacts associated with effects upon marine water quality due to any accidental release of pollutants	Out	

Given that all potential impact pathways for in-combination effects have been screened out, there will be **no adverse effect on the populations of the marine mammal QI of the Inishmore Island SAC, Kilkieran Bay and Islands SAC, Lower River Shannon SAC, Slyne Head Peninsula SAC, Slyne Head Islands SAC, West Connacht Coast SAC, Galway Bay Complex SAC, Blasket Islands SAC and Duvillaun Islands SAC, or any other SAC with marine mammal QIs at a greater distance from the Offshore Site, resulting from the Offshore Site alone.**

4.1.4 Mitigation to avoid adverse effects on integrity of European Sites

The following mitigation measures will be implemented to avoid adverse effects on integrity of European sites during construction, operations and maintenance and decommissioning of the Offshore Site.

4.1.4.1 Mitigation against introduction and spread of INNS

Mitigation will include implementation of the Project's Offshore Environmental Management Plan (OEMP) which includes measures for pollution prevention, biosecurity assessment and waste management; A Marine Pollution Contingency Plan (MPCP) and a Marine INNS management plan (MINNSMP) are included as part of the OEMP. These management plans detail the measures being taken to avoid the introduction and spread of INNS, including adherence to the BWM Convention and other applicable international regulations, as well as containment procedures in the unlikely event that INNS are found. Additional standard mitigation will be undertaken, including for swapping out ballast water, cleaning hulls, floating structures, etc.

Specific measures outlined in the Project MINNSMP include:

- All vessels following guidance as directed by the 'Guidelines for the control and management of ships biofouling to minimize the transfer of invasive aquatic species' (IMO, 2023);
- Where applicable, all vessels will comply with the 'International Convention for the Control and Management of Ships' Ballast Water and Sediments' (IMO, 2021);
- Risk of INNS via the wet towing of GBS will be reduced with the treatment with anti-fouling paint. All anti-fouling paint will be compliant with The International Convention on the Control of Harmful Anti-fouling Systems on Ships (AFS Convention), and the Sea Pollution (Control of Anti-Fouling Systems on Ships) Regulations 2008 (S.I. No. 82/2008);
- Contractors will be required to submit a Biosecurity Risk Assessment to the Environmental Manager at least six weeks prior to operations commencing;

- The contractors must ensure that all equipment, materials, machinery, Personal Protective Equipment (PPE) and vessels used are in a clean condition prior to their arrival on site to minimise the risk of INNS introduction into the marine environment;
- The Project Ecological Clerk of Works will raise awareness of INNS, including identification guidance on the key risk species. If uncertainty arises, the following contingency measures will be followed:
  - Collaborate with the relevant Port Authority and other users of the offshore wind farm area to raise INNS awareness;
  - Assess INNS risk of any slow moving or inactive craft and take steps;
  - Ensure a Check, Clean and Dry message is sent to any new (sub) contractors;
  - Confirm origin of material used in constructing of infrastructure;
  - Ensure 'tool box' talks on INNS prevention and monitoring;
  - Collaborate with the relevant Port Authority and other users of the offshore wind farm area to raise INNS awareness;
  - Liaison with Environmental Protection Agency (EPA) and National Parks and Wildlife Service (NWPS) to identify any new INNS risks and thus potential mitigation requirements are well understood and enacted as soon as possible; and
  - If required, a Contingency plan protocol will be followed as outlined in project specific MINNSMP which outlines key actions and responsibilities.

4.1.4.2 Underwater noise mitigation

The following mitigation is used to avoid impacts of underwater noise.

- Use of GBS foundations which avoids the requirement for impact piling, which generates high-amplitude impulsive sound which would have far greater effects on acoustically sensitive species than those predicted for the Offshore Site;
- Micro-siting to avoid pUXO, where possible, thereby negating the requirement for cUXO clearance, such that the underwater noise emissions associated with this activity can be avoided; and
- Implementation of a VMP for underwater noise mitigation to reduce the underwater noise effects associated with vessel sounds.

4.1.4.3 Marine mammal mitigation

Mitigation measures for marine mammal receptors have been incorporated into the design of geophysical site investigation surveys, including:

- Mitigation implemented during use of geophysical survey equipment:
  - Marine mammal monitoring using a qualified MMO to monitor marine mammals and log all relevant events. The MMO will carry out visual observations before the soft-start commences and will recommend delays in the commencement of site investigations should any species be detected;
  - A mitigation zone of 1,000 m around the UHRS sound source and a 500 m radial distance around the SBP sound source will be used. Should any marine mammal species be detected within the monitored zone, the acoustic survey will not commence until the animals have moved out of the relevant mitigation zone or the transit of the survey vessel takes it away from them;
  - A soft start (i.e. a gradual ramping up of power over time) will be conducted to give any marine mammals adequate time to leave the area;
  - Where the duration of a survey line or station change is greater than 40 minutes, the activity will, on completion of the line/station being surveyed, either cease or undergo a reduction in energy output to a lower state;

  - If there is a break in sound output for a period of 5-10 minutes, MMO monitoring will be undertaken to check that no marine mammals are observed within the Monitoring Zone;
  - Reporting by the MMO will follow standard guidance (DAHG, 2014) and will be completed within 30 days of completion of any geophysical survey activity; and
  - Project vessels will be moving at a maximum speed of approximately 5 knots during surveys to allow marine mammal species to move away from vessels.
- Appendix 12: MMMP will be strictly adhered to during both low-order and high-order UXO clearance. This MMMP contains mitigation measures including:
  - ADD to temporarily displace animals away from the highest risk (injury) zones;
  - MMOs to ensure that there are no marine mammals in close proximity (1,000 metres) of the UXO being cleared;
  - Pre-search, in which MMOs will conduct a pre-search over the mitigation zone for 60 minutes and will continue throughout UXO clearance activities in line with NPWS (2014) and draft JNCC (2024) guidelines;
  - Post-search, conducted for a minimum of 20 minutes to record any notable information, including in the event of instances of injury or death of marine life including fish;
  - Measures in the event of a misfire; and
  - Measures in the event of an unexpected delay.

4.1.4.4 Vessel presence mitigation

Vessel movements will be managed in a way that will mitigate the negative effects to marine mammals. These measures are described in detail in Appendix 13: Vessel Management Plan, including:

- Vessels engaged in construction works will typically be travelling at slow (<6 kts) speeds. This will reduce sound emissions relative to high-speed transiting and reduce the underwater sound effects associated with vessel sounds; and
- Vessels will follow prescribed routes (non-random movement).

4.2 Assessment of SPAs

4.2.1 Introduction

As outlined in Table 3-11, several designated SPAs have been carried through the Stage 1 Screening Assessment to be assessed in Stage 2 as an LSE could not be ruled out. The proposed offshore site does not overlap with any of these designated SPAs. However, seabirds are typically highly mobile with large foraging ranges in the breeding season, therefore the listed sites have been screened in due to potential LSE on the QI species as a result of the Offshore Site. The Stage 1 screening concluded that there was potential for LSE in the Operation and Maintenance phase as a result of displacement and collision. Appendix 6 - Chapter 11 Offshore Ornithology Section 11.8) concluded that there would be no significant impacts on Offshore Ornithology associated with Construction and Decommissioning activities, due to the temporary nature of these activities. Potential impacts arising from disturbance and displacement within the OAA, disturbance and displacement along the OEC route and indirect effects on foraging seabirds were assessed during construction. It was concluded that the impact during the construction phase in all three cases would be a slight negative effect and not significant. Potential impacts arising from disturbance and displacement within the OAA during the decommissioning phase was assessed. The assessment of the potential impacts arising during this stage also concluded that there would be a slight negative effect and is not significant. Therefore, it is considered that any such impacts associated with Construction and Decommissioning activities will not cause LSE on QIs for SPAs, due to their temporary nature and the distances involved between the activities and the SPAs. Construction and Decommissioning effects have therefore been screened out of further assessment.
Flight height varies between seabird species, meaning that some species e.g. large gulls are more susceptible to collisions than for typically low-flying species such as auks. Evidence from reviews of post-construction studies (e.g. Dierschke *et al.,* 2016 and Bradbury *et al.,* 2014) was used to screen out species that were considered to be at low risk of collision impacts. This was done in combination with results from baseline surveys to further screen out species that were only recorded in the OAA occasionally in very low numbers. Such species were considered to occur in such low numbers that no population level effect would occur. This enabled the selection of SPAs and QI species for which a potential LSE for collision could not be ruled out.

Sensitivity to displacement effects also varies between seabird species, with some species groups e.g. auks considered more susceptible to displacement effects than other species groups e.g. large gulls which may be attracted to OWFs. Evidence from reviews of post-construction studies (e.g. Dierschke *et al.,* 2016 and Bradbury *et al.,* 2014) was used to screen out species that were considered to be at low risk of displacement impacts. As before, results from baseline surveys were also applied to further screen out species that were only recorded in the OAA occasionally in very low numbers and thus considered to occur in such low numbers that no population level effect would occur. This enabled the selection of species and SPA combinations for which a potential LSE for displacement could not be ruled out.

For the purposes of this NIS, the Offshore Ornithology Study Area is defined as the OAA and a 4 km buffer around the OAA. As set out in Section [2.2] and Section [2.3] above, the OAA has been defined with reference to the baseline assessment and detailed site surveys carried out for the Offshore Project. The OECC was considered for inclusion in the Offshore Ornithology Study Area and was not included on basis of the very limited nature of Operational and Maintenance works anticipated with the OECC and therefore a lack of a pathway for effect. (Appendix 6 Marine Ornithology)

A summary of the site-specific baseline surveys undertaken to inform the Stage 2 Assessment on Offshore Ornithology is presented below. The digital aerial survey (DAS) survey design consisted of 32 strip transects over the original development area and a 10 km surrounding buffer, extending roughly northeast to southwest, perpendicular to the depth contours along the coast to ensure each transect sampled a similar range of habitats (primarily relating to water depth) to reduce the variation in seabird abundance estimates between transects. The survey design consisted of 12 1 km-spaced transects across the OAA ($37.22km^2$) and a surrounding 2 km buffer, creating an overall area of 100.30 km^2 and achieving approximately 25% coverage. In addition, a series of 2 km-spaced transects were flown over the entire 4 km and 10k m buffers, achieving approximately 15% and 12.5% coverage, for the 4 km and 10 km buffers respectively. Monthly DAS surveys were flown by HiDef Aerial Surveys Ltd between October 2021 and September 2023.

As the baseline site characterisation has been based on 24 months of recent digital aerial survey data, it is considered to be representative of the Project OAA and surrounding buffer area for the purpose of preparing this NIS.

A technical report has been prepared to provide a detailed characterisation of the receiving offshore ornithology baseline, hereafter the Baseline Ornithology Report (Appendix 5). Data to inform this characterisation of the receiving environment has been collated from a series of site-specific surveys supplemented with a thorough desk-based study of published data. Data was drawn from 24 months of site-specific digital aerial surveys and existing published datasets. This section is intended to be a summary of the key findings presented in the Baseline Ornithology Report for the OAA and 4 km buffer (Offshore Ornithology Study Area).

Full details of the analysis undertaken on the baseline digital aerial survey data is provided in the Baseline Ornithology Report (Appendix 7, which includes information on survey design and methods, as well as the analysis techniques implemented to characterise the baseline.

Between October 2021 and September 2023, 17 seabird species were regularly recorded (more than 10 birds, raw numbers) on digital aerial baseline surveys in the Offshore Ornithology Study Area. A further eight species were recorded occasionally on baseline surveys. A summary of the distribution and abundance of QI species carried through to this Stage 2 Assessment and their conservation status is presented in Table 4-16.

Table 4-16 Summary of distribution and abundance of QI seabird species recorded on Baseline Surveys in the Offshore Ornithology Study Area

Species and Conservation Status	Summary of Baseline Results
Great Northern Diver *Gavia immer* BoCCI Amber-listed, Birds Directive Migratory Species	Within the OAA, birds were recorded between October and May in Year 1, with peak estimated numbers recorded in April (10 birds). In Year 2, birds were recorded between December and May, with peak estimated numbers recorded in December and April (12 birds). Recorded in the OAA and 4 km buffer between October and May in Year 1, with an estimated peak of 52 birds in April 2022. In Year 2, great northern divers were recorded between December and May, with a peak estimate of 54 birds in April 2023.
Fulmar *Fulmarus glacialis* BoCCI Amber listed, Birds Directive Migratory Species	Recorded in the OAA and 4 km buffer in low numbers, primarily in the breeding season. Peak estimated numbers in Year 1 were 57 birds in December 2021 and 22 birds in September 2022. In Year 2, peak estimated numbers were recorded in June 2023 (31 birds) and August 2023 (34 birds).
Manx Shearwater *Puffinus puffinus*	Within the OAA, birds were recorded between March and July in Year 1, with peak estimated numbers recorded in May (485 birds). In Year 2, birds were recorded between April and August, with peak estimated numbers recorded in June (388 birds).

Species and Conservation Status	Summary of Baseline Results
BoCCI Amber listed, Birds Directive Migratory Species	In the OAA and 4 km buffer, birds were recorded between March and August of Year 1, with peak estimated numbers recorded in May (28,093 birds). In Year 2, birds were recorded between April and September, with peak estimated numbers recorded in May (3,359 birds). Unpublished count of 32,836 pairs of Manx shearwater breeding on Cruagh Island received from NPWS (D. Tierney, pers. comm.).
Gannet *Morus bassanus* BoCCI Amber listed, Birds Directive Migratory Species	Within the OAA, gannets were recorded between April and August in Year 1, with peak estimated numbers recorded in May (29 birds). In Year 2, birds were recorded in December and between April and September, with peak estimate of 13 birds in September). In the OAA and 4 km buffer in Year 1, gannets were recorded in November and December, and between March and September, with an estimated peak of 46 birds in May. In Year 2, gannets were recorded in most months, with peak estimated numbers recorded in August (133 birds).
Lesser black-backed Gull *Larus fuscus* BoCCI Amber listed, Birds Directive Migratory Species	Within the OAA, lesser black-backed gulls were recorded in low numbers in March and May to July in Year 1, with a peak estimate of 17 birds in July. In Year 2, birds were recorded in low numbers in April and July, with a peak estimate of 12 birds in April. In the OAA and 4 km buffer, lesser black-backed gulls were recorded in low numbers between March and September in Year 1, with a peak estimate of 180 birds in July. In Year 2, birds were recorded in low numbers between April and July, with a peak estimate of 62 birds in April.
Herring Gull *Larus argentatus* BoCCI Amber listed, Birds Directive Migratory Species	Within the OAA, herring gulls were recorded in low numbers in January, May, August and September in Year 1, with a peak estimate of nine birds in September. In Year 2, birds were recorded in low numbers in October, November, January, April and May, with a peak estimate of 33 birds in April. In the OAA and 4 km buffer, herring gulls were recorded in mostly low numbers in all months except December, March, April and June in Year 1, with a peak estimate of 525 birds in July. In Year 2, birds were recorded in low numbers in all months, with a peak estimate of 81 birds in April.
Great black-backed Gull *Larus marinus* BoCCI Green listed, Birds Directive Migratory Species	Within the OAA, great black-backed gulls were recorded in low numbers predominantly in the non-breeding season in Year 1, with a peak estimate of 12 birds in October. In Year 2, birds were recorded in low numbers in all months except October, July and September, with a peak estimate of five birds in January, February, March, June and August. In the OAA and 4 km buffer, great black-backed gulls were recorded in mostly low numbers in all months except March and June in Year 1, with a peak estimate of 134 birds in July. In Year 2, birds were recorded in low numbers in all months except July, with a peak estimate of 194 birds in May.

Species and Conservation Status	Summary of Baseline Results
Kittiwake *Rissa tridactyla* BoCCI Red listed, Birds Directive Migratory Species	Within the OAA, kittiwakes were recorded in low numbers in most months, apart from January, August and September in Year 1, with a peak estimate of 76 birds in March. In Year 2, birds were recorded in low numbers in all months except October, with a peak estimate of 52 birds in June. Kittiwakes were recorded in the OAA and 4 km buffer in all months except September of Year 1, with peak estimates of 167 birds in March and 266 birds in July. In Year 2, kittiwakes were recorded in all months, with peak estimates in February (352 birds) and July (182 birds).
Arctic Tern *Sterna paradisaea* BoCCI Amber listed, Birds Directive Migratory Species, Birds Directive Annex 1	Within the OAA, Arctic terns were only recorded in June of Year 1, with a peak estimate of 11 birds. In Year 2, birds were only recorded in June and July, with a peak estimate of 12 birds in both months. Arctic terns were recorded in the OAA and 4 km buffer between May and July of Year 1, with a peak estimate of 94 birds in July. In Year 2, Arctic terns were also recorded between May and July, with a peak estimate of 95 birds.
Guillemot *Uria aalge* BoCCI Amber listed, Birds Directive Migratory Species	Within the OAA, guillemots were recorded in all months in Year 1, with a peak estimate of 246 birds in April. In Year 2, birds were again recorded in all months, with a peak estimate of 508 birds in May. In the OAA and 4 km buffer guillemots were recorded in all months, with higher numbers recorded in the breeding season. The peak estimated number was 5,314 birds in July. In Year 2, guillemots were also recorded in all months, with a peak estimate of 7,114 birds in May.
Razorbill *Alca torda* BoCCI Red listed, Birds Directive Migratory Species	Within the OAA, razorbills were recorded in low numbers between November and July in Year 1, with a peak estimate of 28 birds in March. In Year 2, birds were recorded in low numbers in most months, with a peak estimate of 55 birds in November. In the OAA and 4 km buffer razorbills were recorded in all months except October, April, June and September, with peak estimates of 640 birds in November and 707 birds in July. In Year 2, razorbills were recorded in all months except October and March, with peak estimates of 308 birds in November and 268 birds in May.
Puffin *Fratercula arctica* BoCCI Red listed, Birds Directive Migratory Species	Within the OAA, puffins were only recorded in April, May and September of Year 1, with a peak estimate of 37 birds in May. In Year 2, puffins were only recorded in May and June, with a peak estimate of 24 birds in June. In the OAA and 4 km buffer puffins were only recorded in October, April, May and September, with a peak estimate of 132 birds in May. In Year 2, puffins were only recorded between April and July, with a peak estimate of 453 birds in July.

Where seabird species were not recorded in the OAA over the duration of site-specific baseline surveys (24 months), it is considered objectively reasonable using expert judgement that such species are extremely unlikely to use the OAA in numbers large enough to warrant further consideration. These species were therefore screened out in Table 3-1 as having no pathway for LSE on European sites. The species that were not recorded on baseline surveys were Leach's petrel, red-throated diver, black-throated diver and black-headed gull.

In addition, some seabird species were only recorded in the OAA in very low numbers (annual peak count of less than 10 birds) in each year of the site-specific baseline surveys (Appendix 7). These species were also considered using expert judgement to be extremely unlikely to use the OAA in numbers large enough to warrant further consideration. The seabird species that were only recorded infrequently on baseline surveys are storm petrel and common gull. Therefore, SPAs for these infrequently recorded seabird species were also screened out in Table 3-1 as having no pathway for LSE on European sites.

4.2.1.1 Wildfowl and wader populations of intertidal SPAs

There are several species of waders and wildfowl that use intertidal SPAs on migration and in winter months for feeding and roosting. These species do not feed in the open sea and may only fly through the OAA on migration, although numbers of birds involved are likely to be low. The migration of these species is generally assumed to occur over a broad front, and there is evidence from ringing and tracking studies that indicates that this is likely to be the case for many species of waders and wildfowl (Woodward *et al.,* 2023).

During spring and autumn migration, the presence of wind turbines (WTG) within the OAA may cause individual birds to alter their route to avoid the OAA. While this potentially could increase their energy budgets, it is considered that overall, compared to the typically large distances travelled on migration, any additional distance associated with avoiding the OAA will be small. Studies have estimated that energy costs of one-off avoidances during migration were small, accounting for less than 2% of available fat reserves (e.g. Masden *et al.,* 2010, Masden *et al.,* 2012).

Three species of wildfowl and waders were recorded in the Offshore Ornithology Study Area on baseline surveys between October 2021 and September 2023. Peak estimates involved eight curlews in March 2022, 41 oystercatchers in December 2021 and 107 whimbrels in May 2023 (Appendix 5).

Species of wildfowl and waders that are QIs for intertidal SPAs that could be susceptible to collision with turbines in the OAA during the spring and autumn migration periods have been considered in the mCRM Appendix (Appendix 10)

The mCRM assessment has been used to inform the NIS in the following assessment text.

4.2.2 Key parameters for Assessment

This section outlines the key project design elements in terms of offshore ornithology. The two impacts brought forward to the Stage 2 Assessment in respect of which a potential LSE on European Sites could not be ruled out are displacement and collision.

For displacement, there is evidence from existing offshore wind farms that indicates that if there is displacement that it will be limited to within 2 km of the wind farm boundary for the majority of species. However, for more sensitive species such as red-throated and great northern divers, guidance states that a 4 km buffer should be used (SNCBs, 2022a&b), and this has been applied here. Further details are provided in the Displacement Technical Report (Appendix 9).

In order to assess mortality of key bird species as a result of collision with offshore wind turbines, collision risk modelling (CRM) was conducted based on 30 turbines with a rotor radius of 146m and a turbine tip height of 324.9m. Further details are provided in the CRM Technical Report (Appendix 6).

The approach to collision risk modelling was based on NatureScot guidance (NatureScot, 2023), updated by advice from the UK Statutory Nature Conservation Bodies (SNCBs) (JNCC *et al.,* 2024).

The modelling used the bird survey data from the surveys described in the Baseline Ornithology Report. The stochLAB R package (Caneco *et al.,* 2022) was used to carry out the modelling. For this assessment, the CRM was run using published generic flight height distributions to calculate the proportion of flight activity at collision risk height in the calculation of predicted transits (Option 2 of the model). This is the approach recommended by NatureScot (NatureScot, 2023).

Avoidance of turbines by birds can be divided into micro-, meso- and macro-avoidance, depending on the spatial scale at which it occurs. Micro- and meso-avoidance takes place within the wind farm. Macro-avoidance refers to avoidance of the wind farm site and represents the combined results of any displacement impacts or barrier effects that are generated by the wind farm.

The CRM assessment applied the avoidance rates recommended in the SNCB guidance (JNCC *et al.,* 2024). While this guidance reflects micro- and meso-avoidance behaviour, it does not take account of any macro-avoidance behaviour. However, there is strong evidence that gannets show significant macro-avoidance of offshore wind farms (Pavat *et al.,* 2023). Therefore, collision risk modelling that does not take account of macro-avoidance will significantly overestimate the collision risk for gannet.

The recent collision risk models for two Irish East Coast Phase 1 projects used a macro-avoidance rate of 0.70 for gannet. This was based on interim guidance (Natural England, 2023), which suggested "reducing the density of gannet in flight going into the CRM, either by a representative range of macro-avoidance rates of between 65% - 85% or by selecting a single rate of 70%". Since the publication of that interim guidance, the results of a review of gannet macro-avoidance has been published (Pavat *et al.,* 2023). This review reported a mean gannet macro-avoidance rate of 0.8564 (95% CI of 0.5349 – 0.97326). The SNCB guidance (JNCC *et al.,* 2024) does not give any specific guidance on macro-avoidance values to use for gannet.

For the CRM assessment, a macro-avoidance rate of 0.70 was used for gannet, in line with the values used in the recent Irish East Coast Phase 1 projects. This is precautionary compared to the mean gannet macro-avoidance rate from the Pavat *et al.* (2023) review of 0.8564. Further details are presented in the CRM Technical Report (Appendix 6).

4.2.3 Connectivity and Apportioning

During the breeding season, many seabird species are central-place foragers, and most individuals recorded at-sea will be breeding adults associated with a breeding colony. A number of these breeding colonies are protected as SPAs. An apportioning assessment was undertaken to identify which SPA colonies have 'connectivity' with the OAA, and to determine the proportions of birds detected in the OAA that are likely to be coming from each of these SPA colonies.

Connectivity was determined based on the seabird foraging ranges from identified breeding colonies (both SPA and non-SPA colonies). In the absence of relevant Irish guidance, the approach was based on advice from NatureScot (2023) and resulted in a 'long-list' of colonies requiring further consideration. Apportioning was then undertaken to determine the proportional weightings between each colony, which was used to share estimated impacts from the Project between the relevant SPA colonies. Apportioning during the breeding season followed NatureScot (2018) guidance.

Currently there is no formal guidance in place to detail any recommended methodologies for apportioning of non-breeding season impacts against the breeding seabird colonies. Non-breeding season apportioning was undertaken for the key species of interest based on the Method Statement for the East Coast Phase One offshore projects in Ireland (GoBe, 2022). This approach was agreed between the east coast Phase 1 developers and to maintain consistency in approach has been adopted here.

Further details of the approaches used to determine connectivity and apportioning are presented in the Offshore Ornithology Apportioning Report (Appendix 7).

4.2.4 Assessment of SPAs

4.2.4.1 Mid-Clare Coast SPA (4182)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Mid- Clare Coast SPA in light of its Conservation Objectives which are listed in Table 3-11.

This SPA is designated for nationally important populations of wintering barnacle geese, while in summer it supports a range of breeding seabirds including a nationally important colony of cormorants. There are also five wader species that are QIs for this SPA (ringed plover, sanderling, purple sandpiper, dunlin and turnstone). In addition, the wetlands and associated waterbirds within this SPA are of special conservation interest for Wetland & Waterbirds (NPWS, 2024).

Cormorants have a mean maximum foraging range of 33.9 km (Woodward *et al.,* 2019), therefore there is no potential for connectivity for this species between this SPA and the OAA. In addition, cormorants are not considered to be at risk of displacement or barrier effects as there is evidence of strong attraction to OWFs for this species (e.g. Dierschke *et al.*, 2016). The species is also considered to have a low sensitivity to collisions with OWFs (e.g. Bradbury *et al.,* 2014). Overall, numbers of cormorants recorded within the OAA on baseline surveys were low, Within the OAA, cormorants were only recorded in August and September of Year 1, with a peak estimate of five birds in August and September in Year 1 and a peak estimate of 12 birds in June of Year 2. On this basis, there is no adverse effect on this breeding QI species at this SPA.

Barnacle goose was screened in in Table 3-1 as being at potential risk of collision if individuals pass through the OAA on spring and autumn migration or during the winter months, when they may be present within this SPA. However, the results from the mCRM concluded that there was no connecting migratory pathway for this species between the SPA and the OAA, therefore the potential collision risk for this species would be negligible (Appendix 10). On this basis, there is no adverse effect on this non-breeding season QI species at this SPA.

There will also be no adverse effects on the five species of wader that are QIs for this SPA based on the mCRM conclusions that there is no connecting migratory pathway for these species between the SPA and the OAA (Appendix 10).

There will be no adverse effects on the Wetlands and Waterfowl QI for this SPA as the Project avoids activity within this SPA.

In relation to the Mid-Clare Coast SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.2 Slyne Head to Ardmore Point Islands SPA (004159)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Slyne Head to Ardmore Point Islands SPA in light of its Conservation Objectives which are listed in Table 3-11.

This SPA is of high ornithological importance as it supports an internationally important Barnacle Goose population in the non-breeding season. It also has nationally important breeding populations of three tern species (Arctic Tern, Sandwich tern and little tern (NPWS, 2024).

Barnacle goose was screened in in Table 3-1 as being at potential risk of collision if individuals pass through the OAA on spring and autumn migration or during the winter months, when they may be present within this SPA. However, the results from the mCRM concluded that there was no connecting migratory pathway for this species between the SPA and the OAA, therefore the potential collision risk for this species would be negligible (Appendix 10). On this basis, there is no adverse effect on this non-breeding season QI species at this SPA.

The Offshore Site is outside mean maximum foraging distance of breeding little terns from this SPA (Table 3-1). Therefore, it is considered that there will be no impact on little terns from this SPA during the breeding season arising from the Project.

However, there is potential for this species to pass through the OAA on spring and autumn migration. Baseline surveys did not record little terns in the OAA, and there were only sightings in the 4 km buffer in July of Year 2 when the estimated population was eight birds (Appendix 5). As no birds were recorded in the OAA it was not possible to undertake CRM for this species (Appendix 6). Based on this it is considered that very small numbers of little terns are likely to pass through the OAA in autumn migration and therefore it is considered that any collision impact on this species from this SPA would be very low. On this basis, there is no adverse effect on this breeding season QI species at this SPA.

There is also potential for Sandwich tern to pass through the OAA on spring and autumn migration. Baseline surveys did not record Sandwich terns in the OAA, indicating that the OAA is not an important foraging area for this species during the breeding season. There were only sightings in the 4 km buffer around the OAA in July of Year 1 when the estimated population was 65 birds, and in April and June of Year 2 when the estimated population nine birds and eight birds respectively (Appendix 5). As no birds were recorded in the OAA it was not possible to undertake CRM for this species (Appendix 6). Based on this it is considered that very small numbers of Sandwich terns are likely to pass through the OAA in spring and autumn migration and therefore it is considered that any collision impact on this species from this SPA would be very low. On this basis, there is no adverse effect on this breeding season QI species at this SPA.

As per Table 3-11, a source-pathway-receptor chain for adverse effects on one QI species of this SPA (Arctic tern) has been identified, as a result of potential collision and displacement impacts during the Operation and Maintenance phase. These potential impacts are assessed in the following sections.

4.2.4.2.1 *Collision Risk*

Arctic tern

The conservation objectives (COs) for Arctic tern at Slyne Head to Ardmore Point Islands SPA are presented in Table 3-11. Collision impacts are limited to the Operation and Maintenance phase, as turbines will not be operating in the construction or decommissioning phases. It was considered that there was no other source-pathway-receptor chain for adverse effects for the other phases of development therefore the other phases of development are not considered within this assessment.

The Slyne Head to Ardmore Point Islands SPA population of breeding Arctic terns in 1995 was 582 pairs (NPWS, 2024), which equates to 1,164 breeding adults. The breeding population recorded during the Seabirds Count 2015-2021 national census was 123 AON (246 breeding adults) (Appendix 7).

In the breeding season (May to August) the CRM assessment predicted that the mean number of Arctic tern collisions per breeding season would involve 0.2 birds (Appendix 6). In the spring and autumn migration periods of the non-breeding season, the CRM assessment predicted that the mean number of Arctic tern collisions would involve zero birds (Table 4-17).

Table 4-17 Estimated breeding season collision mortality for Arctic terns from Slyne Head to Ardmore Point Islands SPA

Season	Estimated mortality	Most recent population (birds)	Apportioned colony percentage	Estimated SPA mortality
Breeding (May-Aug)	0.2 birds	246	84.2%	0.17 birds
Autumn migration	0 birds	372	0.005%	0 birds
Spring migration	0 birds	372	0.005%	0 birds
Total	0.2	-	-	0.17 birds

In the breeding season, apportioning estimated that 84.2% of estimated Arctic tern collision mortality (0.2 birds) would involve breeding Arctic terns from the Slyne Head to Ardmore Point Islands SPA. This equates to 0.17 birds from the SPA per breeding season (0.2x0.842) (Table 4-17).

In the spring and autumn migration periods of the non-breeding season, estimated SPA mortality was zero birds (Table 4-17).

Overall, total annual Arctic tern collision mortality (0.2 birds) was predicted to involve 0.17 Arctic terns from the Slyne Head to Ardmore Point Islands SPA (Table 4-17).

The Arctic tern breeding population at Slyne Head to Ardmore Point Islands SPA is estimated to be 246 adult birds (Appendix 7), however there will also be immature birds reared at this SPA that form a component of the SPA population. Applying an immature to adult ratio of 0.511 (Horswill & Robinson, 2015), the total estimated SPA population (adults plus immatures) is 372 birds (Table 4-17). For this assessment the baseline annual mortality was calculated based on an estimated average Arctic tern baseline mortality rate (all ages) of 0.183 (Horswill & Robinson, 2015). Applying this mortality rate, the estimated annual baseline mortality of Arctic terns at Slyne Head to Ardmore Point Islands SPA is 68 birds (372 x 0.183). The additional annual predicted mortality of 0.17 Arctic terns would increase the baseline mortality rate by 0.25%.

As highlighted by Natural England guidance, where predicted impacts equate to 1% or below of baseline mortality for a population (e.g. colony population) then this level of impact could be considered non-significant (Parker *et al.,* 2022). As the predicted increase in annual baseline mortality for Arctic tern was below 1%, PVA was not carried out on the Slyne Head to Ardmore Point Islands SPA Arctic tern population, as agreed in the East Coast Phase 1 Method Statement (GoBe, 2022).

On this basis, there will be no adverse effect on the Arctic tern qualifying feature of Slyne Head to Ardmore Point Islands SPA, as defined by the COs for the site as a result of collision effects from the Offshore Site.

4.2.4.2.2 Displacement

Arctic tern

The conservation objectives (COs) for Arctic tern at Slyne Head to Ardmore Point Islands SPA are presented in Table 3-11. Displacement impacts are limited to the Operation and Maintenance phase, as turbines will not be operating in the construction or decommissioning phases. It was considered that there was no other source-pathway-receptor chain for adverse effects for the other phases of development therefore the other phases of development are not considered within this assessment.

The Slyne Head to Ardmore Point Islands SPA population of breeding Arctic terns in 1995 was 582 pairs (NPWS, 2024), which equates to 1,164 breeding adults. The breeding population recorded during the Seabirds Count 2015-2021 national census was 123 AON (246 breeding adults) (Appendix 7).

There is considerable uncertainty on the response of terns to OWFs. A number of studies found no evidence of displacement of terns (e.g. Gill *et al.,* 2008, Leopold *et al.,* 2011, Lindeboom *et al.,* 2011), while results indicating displacement have been recorded at Horns Rev I (Petersen *et al.,* 2006), Egmond aan Zee (Leopold *et al.,* 2013) and Alpha Ventus, where the number of tern clusters reduced by about 75% within the wind farm (Welcker and Nehls, 2016). A review of post-construction studies by Dierscke *et al.,* (2016) concluded that for both common and Arctic terns, evidence for attraction and avoidance behaviour were approximately equal between studies, with no strong evidence of either attraction or avoidance.

The SNCB guidance (2022) states that 'Disturbance Susceptibility' scores based on Bradbury *et al.,* (2014) can be used to determine the appropriate displacement levels on a species-by-species basis. Using this approach, a displacement level of 30% could be applied to Arctic terns, as this species has the same 'Disturbance Susceptibility' score of 3, based on Bradbury *et al*., (2014) as kittiwake. Advice on likely displacement levels from NatureScot for several offshore wind farm projects off the east coast of Scotland recommended a displacement level of 30% for kittiwake (e.g. Marine Scotland, 2022a and Marine Scotland, 2022b). A mortality rate of 1% was considered precautionary and was applied in this assessment.

Within the OAA and 2 km buffer, based on a displacement rate of 30% and a mortality rate of 1%, Arctic tern mortality was predicted to be zero birds as a result of displacement in the breeding season and the autumn and spring migration periods (Appendix 9).

For Arctic tern, zero birds from the SPA were predicted to suffer displacement mortality on the basis that no Arctic tern displacement mortality was predicted (Appendix 9).

On this basis, there will be no adverse effect on the Arctic tern qualifying feature of Slyne Head to Ardmore Point Islands SPA, as defined by the COs for the site as a result of displacement effects from the Offshore Site.

In relation to the Slyne Head to Ardmore Point Islands SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.3 Inishmore SPA (004152)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of Inishmore SPA which are listed in Table 3-11

This SPA is an important site for breeding seabirds, with four species (kittiwake, Arctic tern, little tern and guillemot) having populations of national importance (NPWS, 2024).

The Offshore Site is outside mean maximum foraging distance of breeding little terns from this SPA (Table 3-1). Therefore, it is considered that there will be no impact on little terns from this SPA during the breeding season arising from the Project.

However, there is potential for this species to pass through the OAA on spring and autumn migration. Baseline surveys did not record little terns in the OAA, and there were only sightings in the 4 km buffer in July of Year 2 when the estimated population was eight birds (Appendix 5). As no birds were recorded in the OAA it was not possible to undertake CRM for this species (Appendix 6). Based on this it is considered that very small numbers of little terns are likely to pass through the OAA in autumn migration and therefore it is considered that any collision impact on this species from this SPA would be very low. On this basis, there is no adverse effect on this breeding season QI species at this SPA.

As per Table 3-11, a source-pathway-receptor chain for adverse effects on three QI species of this SPA (kittiwake, Arctic tern and guillemot) have been identified, as a result of potential collision and displacement impacts during the Operation and Maintenance phase. These potential impacts are assessed in the following sections.

4.2.4.3.1 Collision Risk

Kittiwake

The conservation objectives (COs) for kittiwake at Inishmore SPA are presented in Table 3-11. Collision impacts are limited to the Operation and Maintenance phase as turbines will not be operating in the construction or decommissioning phases. It was considered that there was no other source-pathway-receptor chain for adverse effects for the other phases of development therefore the other phases of development are not considered within this assessment.

The Inishmore SPA population of breeding kittiwakes in 1999 was 587 pairs (NPWS, 2024), which equates to 1,174 breeding adults. The breeding population recorded during the Seabirds Count 2015-2021 national census was 101 AON (202 breeding adults) (Appendix 7).

In the breeding season (March to August) the CRM assessment predicted that the mean number of kittiwake collisions per breeding season would involve 4.4 birds (Appendix 6). However, this includes non-breeding adults and immature birds, as well as breeding adults. Based on the proportion of immature kittiwakes recorded on baseline surveys in the breeding season (Appendix 7), it was assumed that 91.95% of the population present are adult birds. This would mean that an estimated 4.0 kittiwakes predicted to collide during the breeding season would be adult birds.

Similarly, a proportion of adult birds present at colonies in the breeding season will opt not to breed in a particular breeding season. It has been estimated that 10% of adult kittiwakes may be “sabbatical” birds in any particular breeding season (Xodus, 2023), and this has been applied for this assessment. On this basis, 0.4 adult kittiwakes predicted to collide was considered not to be breeding. Therefore, adult kittiwake mortality in the breeding season was considered to involve 3.6 adult breeding birds and 0.4 non-breeding adults.

In the autumn migration period of the non-breeding season, the CRM assessment predicted that the mean number of kittiwake collisions would involve 2.8 birds. In the spring migration period of the non-breeding season, the CRM assessment predicted that the mean number of kittiwake collisions would involve 1.0 birds (Table 4-18).

Table 4-18 Estimated breeding season collision mortality for kittiwakes from Inishmore SPA

Season	Estimated mortality	Most recent population (birds)	Apportioned colony percentage	Estimated SPA mortality
Breeding (Mar-Aug)	3.6 breeding adults	202	11.9%	0.42 birds
Autumn migration	2.8 birds	384	0%	0 birds
Spring migration	1.0 birds	384	0.1%	0.001 birds
Total	8.2	-	-	0.42 birds

In the breeding season, apportioning estimated that 11.9% of estimated kittiwake collision mortality (3.6 breeding adults) would involve breeding kittiwakes from the Inishmore SPA. This equates to 0.42 birds from the SPA per breeding season (3.6x0.119) (Table 4-18).

In the autumn migration period of the non-breeding season, apportioning estimated that 0% of estimated kittiwake collision mortality would involve kittiwakes from the Inishmore SPA. Therefore, estimated SPA mortality was zero birds in the autumn migration period (Table 4-18).

In the spring migration period of the non-breeding season, apportioning estimated that 0.1% of estimated kittiwake collision mortality (1.0 birds) would involve kittiwakes from the Inishmore SPA. This equates to 0.001 birds from the SPA per breeding season (1.0x0.001) (Table 4-18).

Overall, total annual kittiwake collision mortality (8.2 birds) was predicted to involve 0.42 kittiwakes from the Inishmore SPA (Table 4-18).

The kittiwake breeding population at Inishmore SPA is estimated to be 202 adult birds (Appendix 7), however there will also be immature birds reared at this SPA that form a component of the SPA population. Applying an immature to adult ratio of 0.898 (Horswill & Robinson, 2015), the total estimated SPA population (adults plus immatures) is 384 birds (Table 4-18). For this assessment the baseline annual mortality was calculated based on an estimated average kittiwake baseline mortality rate (all ages) of 0.156 (Horswill & Robinson, 2015). Applying this mortality rate, the estimated annual baseline mortality of kittiwakes at Inishmore SPA is 59.7 birds (383 x 0.156). The additional annual predicted mortality of 0.42 kittiwakes would increase the baseline mortality rate by 0.7%.

As highlighted by Natural England guidance, where predicted impacts equate to 1% or below of baseline mortality for a population (e.g. colony population) then this level of impact could be considered non-significant (Parker *et al.,* 2022c). As the predicted increase in annual baseline mortality for kittiwake was below 1%, PVA was not carried out on the Inishmore SPA kittiwake population, as agreed in the East Coast Phase 1 Method Statement (GoBe, 2022).

On this basis, there will be no adverse effect on the kittiwake qualifying feature of Inishmore SPA, as defined by the COs for the site as a result of collision effects from the Offshore Site.

Arctic tern

The conservation objectives for Arctic tern at Inishmore SPA are presented in Table 3-11. Collision impacts are limited to the Operation and Maintenance phase therefore the other phases of development are not considered within this assessment, as turbines will not be operating in the construction or decommissioning phases. It was considered that there was no other source-pathway-receptor chain for adverse effects for the other phases of development.

The Inishmore SPA population of breeding Arctic terns in 1995 was 338 pairs (NPWS, 2024), which equates to 676 breeding adults. Arctic terns were not recorded breeding within the Inishmore SPA during the Seabirds Count 2015-2021 national census (Appendix 7).

In the breeding season (May to August) the CRM assessment predicted that the mean number of Arctic tern collisions per breeding season would involve 0.2 birds. (Appendix 6).

Table 4-19 Estimated breeding season collision mortality for Arctic terns from Inishmore SPA

Season	Estimated mortality	Most recent population (birds)	Apportioned colony percentage	Estimated SPA mortality
Breeding (May-Aug)	0.2 birds	0	0%	0 birds

Season	Estimated mortality	Most recent population (birds)	Apportioned colony percentage	Estimated SPA mortality
Autumn migration	0	0	0%	0 birds
Spring migration	0	0	0%	0 birds
Total	0.2	-	-	0 birds

For Arctic tern, zero birds from the SPA were predicted to suffer collision mortality on the basis that Arctic terns were not recorded breeding at the Inishmore SPA in the most recent census (Table 4-19).

On this basis, there will be no adverse effect on the Arctic tern qualifying feature of Inishmore SPA, as defined by the COs for the site as a result of collision effects from the Offshore Site.

4.2.4.3.2 *Displacement*

Kittiwake

The conservation objectives (COs) for kittiwake at the Inishmore SPA are presented in Table 3-11. Displacement impacts are limited to the Operation and Maintenance phase, as turbines will not be operating in the construction or decommissioning phases. It was considered that there was no other source-pathway-receptor chain for adverse effects for the other phases of development therefore the other phases of development are not considered within this assessment.

The Inishmore SPA population of breeding kittiwakes in 1999 was 587 pairs (NPWS, 2024), which equates to 1,174 breeding adults. The breeding population recorded during the Seabirds Count 2015-2021 national census was 101 AON (202 breeding adults) (Appendix 7).

Recent guidance for OWF projects in Scottish waters recommended that a displacement rate of 30% should be used for kittiwakes (NatureScot, 2023), and this displacement rate has been applied for this assessment. NatureScot guidance also recommended that mortality rates of 1% and 3% throughout the year should be used for kittiwake in displacement assessments (NatureScot, 2023). These mortality rates have also been applied for this assessment. Further details of the displacement assessment approach and the seasonal displacement matrices are presented in the Displacement Assessment Appendix (Appendix 9).

Due to the low numbers of birds involved, for the purposes of this assessment, it has been assumed that all predicted mortality involved adult breeding kittiwakes, which is considered to be precautionary, as both adult and immature kittiwakes were recorded in the Offshore Ornithology Study Area on baseline surveys throughout the year (Appendix 7).

In the breeding season, the mean seasonal peak of kittiwakes in the OAA plus 2 km buffer was 93 birds. Based on a displacement rate of 30%, this would mean that an estimated 28 kittiwakes would be displaced from the OAA and 2 km buffer in the breeding season. Applying a 1% mortality rate would therefore involve 0.28 kittiwakes. Applying a 3% mortality rate would involve 0.84 kittiwakes (Table 4-20).

In the autumn migration period of the non-breeding season, the mean seasonal peak of kittiwakes in the OAA plus 2 km buffer was 79 birds. Based on a displacement rate of 30%, this would mean that an estimated 24 kittiwakes would be displaced from the OAA and 2 km buffer in the autumn migration period. Applying a 1% mortality rate would therefore involve 0.24 kittiwakes. Applying a 3% mortality rate would involve 0.72 kittiwakes (Table 4-20).

In the spring migration period of the non-breeding season, the mean seasonal peak of kittiwakes in the OAA plus 2 km buffer was 144 birds. Based on a displacement rate of 30%, this would mean that an estimated 43 kittiwakes would be displaced from the OAA and 2 km buffer in the spring migration period. Applying a 1% mortality rate would therefore involve 0.43 kittiwakes. Applying a 3% mortality rate would involve 1.29 kittiwakes (Table 4-20).

Further details and the seasonal displacement matrices are presented in the Displacement Assessment Appendix (Appendix 9).

Table 4-20 Estimated breeding season displacement mortality for kittiwakes from the Inishmore SPA

Season	Estimated mortality	Most recent population (birds)	Apportioned colony percentage	Estimated SPA mortality
30% displacement and 1% mortality rate				
Breeding (Mar-Aug)	0.28 birds	202	11.9%	0.12 birds
Autumn migration (Sep-Dec)	0.24 birds	384	0%	0 birds
Spring migration (Jan-Feb)	0.43 birds	384	0.1%	0.0004 birds
Annual total	0.95 birds	-	-	0.12 birds
30% displacement and 3% mortality rate				
Breeding (Mar-Aug)	0.84 birds	202	11.9%	0.24 birds
Autumn migration (Sep-Dec)	0.72 birds	384	0%	0 birds
Spring migration (Jan-Feb)	1.29 birds	384	0.1%	0.001 birds
Total	2.85 birds	-	-	0.24 birds

In the breeding season, apportioning estimated that 11.9% of estimated kittiwake displacement mortality would involve breeding kittiwakes from the Inishmore SPA. Based on a 30% displacement rate and a 1% mortality rate, this equates to 0.12 birds from the SPA per breeding season (0.28x0.119). Based on a 30% displacement rate and a 3% mortality rate, this equates to 0.24 birds from the SPA per breeding season (2x0.119) (Table 4-20).

In the autumn migration period of the non-breeding season, apportioning estimated that 0% of estimated kittiwake displacement mortality would involve kittiwakes from the Inishmore SPA. Therefore, estimated SPA mortality was zero birds in the autumn migration period (Table 4-20).

In the spring migration period of the non-breeding season, apportioning estimated that 0.1% of estimated kittiwake displacement mortality would involve kittiwakes from the Inishmore SPA. Based on a 30% displacement rate and a 1% mortality rate, this equates to 0.0004 birds from the SPA per breeding season (0.43x0.001). Based on a 30% displacement rate and a 3% mortality rate, this equates to 0.001 birds from the SPA per breeding season (1.29x0.001) (Table 4-20).

Overall, total annual kittiwake displacement mortality based on a 30% displacement rate and a 1% mortality rate was predicted to involve 0.12 kittiwakes from the Inishmore SPA. Based on a 30% displacement rate and a 3% mortality rate, annual kittiwake displacement mortality was predicted to involve 0.24 kittiwakes from the Inishmore SPA (Table 4-20).

The kittiwake breeding population at Inishmore SPA is estimated to be 202 adult birds (Appendix 7), however there will also be immature birds reared at this SPA that form a component of the SPA population. Applying an immature to adult ratio of 0.898 (Horswill & Robinson, 2015), the total estimated SPA population (adults plus immatures) is 384 birds (Table 4-20). For this assessment the baseline annual mortality was calculated based on an estimated average kittiwake baseline mortality rate (all ages) of 0.156 (Horswill & Robinson, 2015). Applying this mortality rate, the estimated annual baseline mortality of kittiwakes at Inishmore SPA is 59.7 birds (383 x 0.156).

Based on a 30% displacement rate and a 1% mortality rate, the additional annual predicted mortality of 0.12 kittiwakes would increase the baseline mortality rate by 0.2%. Based on a 30% displacement rate and a 3% mortality rate, the additional annual predicted mortality of 0.24 kittiwakes would increase the baseline mortality rate by 0.4%.

As highlighted by Natural England guidance, where predicted impacts equate to 1% or below of baseline mortality for a population (e.g. colony population) then this level of impact could be considered non-significant (Parker *et al.,* 2022c). As the predicted increases in annual baseline displacement mortality for kittiwake were below 1%, PVA was not carried out on the Inishmore SPA kittiwake population, as agreed in the East Coast Phase 1 Method Statement (GoBe, 2022).

On this basis, there will be no adverse effect on the kittiwake qualifying feature of the Inishmore SPA, as defined by the COs for the site as a result of displacement effects from the Offshore Site.

Guillemot

The conservation objectives (COs) for guillemot at Inishmore SPA are presented in Table 3-11. Displacement impacts are limited to the Operation and Maintenance phase, as turbines will not be operating in the construction or decommissioning phases. It was considered that there was no other source-pathway-receptor chain for adverse effects for the other phases of development therefore the other phases of development are not considered within this assessment.

The Inishmore SPA population of breeding guillemots in 1999 was 3,443 individuals (NPWS, 2024). The breeding population recorded during the Seabirds Count 2015-2021 national census was 6,964 individuals (Appendix 7).

Based on the mean seasonal peak of guillemots in the OAA and 2 km buffer, and a displacement rate of 50% and a mortality rate of 1%, displacement mortality was predicted to be 16 birds in the breeding season (March to July). Based on a displacement rate of 60%, and a mortality rate of 3%, displacement mortality was predicted to be 58 birds in the breeding season, increasing to 96 birds, if a mortality rate of 5% is applied. It should be noted that evidence from post-construction monitoring indicates that applying displacement rates greater than 50% and mortality rates of more than 1% is overly precautionary (e.g. APEM, 2022). Further details of how displacement mortality was estimated are presented in the Displacement Assessment (Appendix 9).

However, this estimate includes non-breeding adults and immature birds, as well as breeding adults. Studies have shown that for several seabird species, in addition to breeding birds, colonies are also attended by many immature individuals and a smaller number of non-breeding adults (e.g. Wanless *et al.,* 1998). There is little information on the breakdown of immature and non-breeding adults present at a colony, however, this has been estimated using proportions from Horswill and Robinson (2015) (Appendix 7). Based on the proportion of adult guillemots from the population age ratio (0.522), 52.2% of the population present were assumed to be adult birds, with a corresponding 47.8% of the population assumed to be immature birds. This means that between eight and 50 guillemots displaced from the OAA and 2 km buffer during the breeding season would be adult birds, with between eight and 46 immature birds also displaced.

However, a proportion of adult birds present at colonies in the breeding season will opt not to breed in a particular breeding season. It has been estimated that 7% of adult guillemots may be "sabbatical" birds in any particular breeding season (Xodus, 2023), and this has been applied for this assessment. On this basis, between one and four displaced adult guillemots were considered not to be breeding, therefore guillemot mortality was considered to be between seven and 46 breeding adults, one to four non-breeding "sabbatical" adults and between eight and 46 immature birds (Table 4-21).

For the non-breeding season in the OAA and 2 km buffer, and a displacement rate of 50% and a mortality rate of 1%, displacement mortality was predicted to be two birds. Based on a displacement rate of 60%, and a mortality rate of 1%, displacement mortality was predicted to be two birds in the non-breeding season, increasing to six birds, if a mortality rate of 3% is applied (Table 4-21). Further details and the seasonal displacement matrices are presented in Appendix 9.

Table 4-21 Estimated breeding season displacement mortality for guillemots from Inishmore SPA

Season	Estimated mortality	Most recent population (birds)	Apportioned colony percentage	Estimated SPA mortality
50% displacement and 1% mortality rate				
Breeding (Mar-July)	7	6,964	43.2%	3.0 birds
Non-breeding (Aug-Feb)	2	13,334	1%	0.02 birds
Annual total	9	-	-	3.02 birds
60% displacement and 5% mortality rate in breeding season; 3% in non-breeding season				
Breeding (Mar-July)	46	6,964	43.2%	19.9 birds
Non-breeding (Aug-Feb)	6	13,334	1%	0.06 birds
Total	52	-	-	19.96 birds

In the breeding season, apportioning estimated that 43.2% of estimated guillemot displacement mortality would involve breeding guillemots from the Inishmore SPA. Based on a 50% displacement rate and a 1% mortality rate, this equates to 3.0 birds from the SPA per breeding season (7x0.432). Based on a 60% displacement rate and a 5% mortality rate, this equates to 19.9 birds from the SPA per breeding season (46x0.432) (Table 4-21).

In the non-breeding season, apportioning estimated that 1% of estimated guillemot displacement mortality would involve guillemots from the Inishmore SPA. Based on a 50% displacement rate and a 1% mortality rate, this equates to 0.02 birds from the SPA per non-breeding season (2x0.01). Based on a 60% displacement rate and a 5% mortality rate, this equates to 0.06 birds from the SPA per non-breeding season (6x0.01) (Table 4-21).

Overall, total annual guillemot displacement mortality based on a 50% displacement rate and a 1% mortality rate was predicted to involve 3.02 guillemots from the Inishmore SPA. Based on a 60% displacement rate and a 5% mortality rate in the breeding season and a 3% mortality rate in the non-breeding season, annual guillemot displacement mortality was predicted to involve 19.96 guillemots from the Inishmore SPA (Table 4-21).

The guillemot breeding population at Inishmore SPA is estimated to be 6,964 adult birds (Appendix 7), however there will also be immature birds reared at this SPA that form a component of the SPA population. Applying an immature to adult ratio of 0.916 (Horswill & Robinson, 2015), the total estimated SPA population (adults plus immatures) is 13,344 birds (Table 4-21). For this assessment the baseline annual mortality was calculated based on an estimated average guillemot baseline mortality rate (all ages) of 0.136 (Horswill & Robinson, 2015). Applying this mortality rate, the estimated annual baseline mortality of guillemots at Inishmore SPA is 1,815 birds (13,343x 0.136).

Based on a 50% displacement rate and a 1% mortality rate, the additional annual predicted displacement mortality of 3.0 guillemots would increase the baseline mortality rate by 0.17%. Based on a 60% displacement rate and a 5% mortality rate in the breeding season and a 3% mortality rate in the non-breeding season, the additional annual predicted displacement mortality of 19.96 guillemots would increase the baseline mortality rate by 1.09%.

As highlighted by Natural England guidance, where predicted impacts equate to 1% or below of baseline mortality for a population (e.g. colony population) then this level of impact could be considered non-significant (Parker *et al.,* 2022c). As the predicted increases in annual baseline displacement mortality for guillemot was 1% or below, PVA was not carried out on the Inishmore SPA guillemot population, as agreed in the East Coast Phase 1 Method Statement (GoBe, 2022).

On this basis, there will be no adverse effect on the guillemot qualifying feature of Inishmore SPA, as defined by the COs for the site as a result of displacement effects from the Offshore Site.

Arctic tern

The conservation objectives for Arctic tern at Inishmore SPA are presented in Table 3-11. Displacement impacts are limited to the Operation and Maintenance phase, as turbines will not be operating in the construction or decommissioning phases. It was considered that there was no other source-pathway-receptor chain for adverse effects for the other phases of development therefore the other phases of development are not considered within this assessment.

The Inishmore SPA population of breeding Arctic terns in 1995 was 338 pairs (NPWS, 2024), which equates to 676 breeding adults. Arctic terns were not recorded breeding within the Inishmore SPA during the Seabirds Count 2015-2021 national census (Appendix 7).

There is considerable uncertainty on the response of terns to OWFs. A number of studies found no evidence of displacement of terns (e.g. Gill *et al.,* 2008, Leopold *et al.,* 2011, Lindeboom *et al.,* 2011), while results indicating displacement have been recorded at Horns Rev I (Petersen *et al.,* 2006), Egmond aan Zee (Leopold *et al.,* 2013) and Alpha Ventus, where the number of tern clusters reduced by about 75% within the wind farm (Welcker and Nehls, 2016). A review of post-construction studies by Dierscke *et al.,* (2016) concluded that for both common and Arctic terns, evidence for attraction and avoidance behaviour were approximately equal between studies, with no strong evidence of either attraction or avoidance.

The SNCB guidance (2022) states that 'Disturbance Susceptibility' scores based on Bradbury *et al.,* (2014) can be used to determine the appropriate displacement levels on a species-by-species basis. Using this approach, a displacement level of 30% could be applied to Arctic terns, as this species has the same 'Disturbance Susceptibility' score of 3, based on Bradbury *et al.*, (2014) as kittiwake. Advice on likely displacement levels from NatureScot for several offshore wind farm projects off the east coast of Scotland recommended a displacement level of 30% for kittiwake (e.g. Marine Scotland, 2022a and Marine Scotland, 2022b). A mortality rate of 1% was therefore considered precautionary and was applied in this assessment.

Within the OAA and 2 km buffer, based on a displacement rate of 30% and a mortality rate of 1%, Arctic tern mortality was predicted to be zero birds as a result of displacement in the breeding season and the autumn and spring migration periods (Appendix 9).

For Arctic tern, zero birds from the SPA were predicted to suffer displacement mortality on the basis that no Arctic tern displacement mortality was predicted (Appendix 9), and also because Arctic terns were not recorded breeding at Inishmore SPA in the most recent census (Appendix 7).

On this basis, there will be no adverse effect on the Arctic tern qualifying feature of Inishmore SPA, as defined by the COs for the site as a result of displacement effects from the Offshore Site.

In relation to the Inishmore SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.4 Cruagh Island SPA (004170)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of Cruagh Island SPA which are listed in Table 3-11.

This SPA is of ornithological importance on account of its internationally important breeding population of Manx shearwaters and nationally important population of wintering barnacle geese (NPWS, 2024).

Manx shearwaters have a very large mean maximum foraging range (2,365.5 km) (Woodward *et al.,* 2019) and is therefore not considered to be at risk of displacement or barrier effects (e.g. Bradbury *et al.,* 2014). This species is also not considered to be at risk of collision impacts (e.g. Bradbury *et al.,* 2014) as birds typically fly low to the sea surface. On this basis, there is no adverse effect on this breeding QI species at this SPA.

Barnacle goose was screened in in Table 3-1 as being at potential risk of collision if individuals pass through the OAA on spring and autumn migration or during the winter months, when they may be present within this SPA. However, the results from the mCRM concluded that there was no connecting migratory pathway for this species between the SPA and the OAA, therefore the potential collision risk for this species would be negligible (Appendix 6). On this basis, there is no adverse effect on this non-breeding season QI species at this SPA.

In relation to the Cruagh Island SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.5 River Shannon and River Fergus Estuaries SPA (004077)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of the River Shannon and River Fergus Estuaries SPA which are listed in Table 3-11.

This SPA is an internationally important site that supports an assemblage of over 20,000 wintering waterbirds. It holds an internationally important wintering population of light-bellied brent goose and a nationally important wintering population of whooper swan. The SPA also supports a nationally important breeding population of cormorants. There are further six species of wildfowl and 11 wader species that are also QIs for this SPA. In addition, the wetlands and associated waterbirds within this SPA are of special conservation interest for Wetland & Waterbirds (NPWS, 2024).Whooper swan, light-bellied brent goose and barnacle goose were screened in in Table 3-1 as being at potential risk of collision if individuals from this SPA pass through the OAA on spring and autumn migration. In addition, it was considered that there was also for potential for the six other QI species of wildfowl and 11 QI wader species to be at potential risk of collision if individuals passed through the OAA. However, the results from the mCRM concluded that there was no connecting migratory pathway for this SPA and the OAA, therefore the potential collision risk for these species would be negligible (Appendix 10). On this basis, there is no adverse effect on these non-breeding season QI species at this SPA.

Black-headed gull has been excluded from further assessment on the basis that this species was not recorded within the OAA on baseline surveys (Appendix 7). Where seabird species were not recorded in the OAA over the duration of site-specific baseline surveys (24 months), it is considered objectively reasonable using expert judgement to exclude them from further assessment. Seabird species that were not recorded in the OAA on baseline surveys were considered extremely unlikely to use the OAA in numbers large enough to warrant further consideration.

There will be no adverse effects on the Wetlands and Waterfowl QI for this SPA as the Project avoids activity within this SPA.

In relation to the River Shannon and River Fergus Estuaries SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.6 Cliffs of Moher SPA (004005)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of the Cliffs of Moher SPA which are listed in Table 3-11.

This SPA is one of the most important seabird colonies in the country, with nationally important populations of five species (fulmar, kittiwake, guillemot, razorbill and puffin). A nationally important population of Chough were also recorded breeding at the site in 2002/03 (NPWS, 2024).

Fulmars are not considered to be at risk of displacement or barrier effects (e.g. Dierschke *et al.*, 2016). The species is also considered to have a low sensitivity to collisions with OWFs (e.g. Bradbury *et al.,* 2014), as birds typically fly low to the sea surface. On this basis, there is no adverse effect on this breeding QI species at this SPA.

The AASR concluded that because chough is a terrestrial species, there is no pathway for this species to be at risk of adverse effects from the Offshore Site , therefore it is not considered further.

As per Table 3-11, a source-pathway-receptor chain for adverse effects on four QI species of this SPA (kittiwake, guillemot, razorbill and puffin) have been identified, as a result of potential collision and displacement impacts during the Operation and Maintenance phase. These potential impacts are assessed in the following sections.

4.2.4.6.1 *Collision Risk*

Kittiwake

The conservation objectives (COs) for kittiwake at the Cliffs of Moher SPA are presented in Table 3-11. Collision impacts are limited to the Operation and Maintenance phase, as turbines will not be operating in the construction or decommissioning phases. It was considered that there was no other source-pathway-receptor chain for adverse effects for the other phases of development therefore the other phases of development are not considered within this assessment.

The Cliffs of Moher SPA population of breeding kittiwakes in 1999 was 7,698 pairs (NPWS, 2024), which equates to 15,396 breeding adults. The breeding population recorded during the Seabirds Count 2015-2021 national census was 3,981 AON (7,962 breeding adults) (Appendix 7).

In the breeding season (March to August) the CRM assessment predicted that the mean number of kittiwake collisions per breeding season would involve 4.4 birds (Appendix 6). However, this includes non-breeding adults and immature birds, as well as breeding adults. Based on the proportion of immature kittiwakes recorded on baseline surveys in the breeding season (Appendix 7), it was assumed that 91.95% of the population present are adult birds. This would mean that an estimated 4.0 kittiwakes predicted to collide during the breeding season would be adult birds.

Similarly, a proportion of adult birds present at colonies in the breeding season will opt not to breed in a particular breeding season. It has been estimated that 10% of adult kittiwakes may be "sabbatical" birds in any particular breeding season (Xodus, 2023), and this has been applied for this assessment. On this basis, 0.4 adult kittiwakes predicted to collide was considered not to be breeding. Therefore, adult kittiwake mortality in the breeding season was considered to involve 3.6 adult breeding birds and 0.4 non-breeding adults (Table 4-22).

In the autumn migration period of the non-breeding season, the CRM assessment predicted that the mean number of kittiwake collisions would involve 2.8 birds. In the spring migration period of the non-breeding season, the CRM assessment predicted that the mean number of kittiwake collisions would involve 1.0 birds (Table 4-22).

Table 4-22 Estimated breeding season collision mortality for kittiwakes from Cliffs of Moher SPA

Season	Estimated mortality	Most recent population (birds)	Apportioned colony percentage	Estimated SPA mortality
Breeding (Mar-Aug)	3.6 breeding adults	7,962	68.3%	2.5 birds
Autumn migration	2.8 birds	15,112	1.6%	0.04 birds
Spring migration	1.0 birds	15,112	2.1%	0.02 birds
Total	8.2	-	-	2.6 birds

In the breeding season, apportioning estimated that 68.3% of estimated kittiwake collision mortality (3.6 breeding adults) would involve breeding kittiwakes from the Cliffs of Moher SPA. This equates to 2.5 birds from the SPA per breeding season (3.6x0.683) (Table 4-22).

In the autumn migration period of the non-breeding season, apportioning estimated that 1.6% of estimated kittiwake collision mortality (2.8 birds) would involve kittiwakes from the Cliffs of Moher SPA. Therefore, estimated SPA mortality was 0.04 birds in the autumn migration period (2.8x0.016) (Table 4-22).

In the spring migration period of the non-breeding season, apportioning estimated that 2.1% of estimated kittiwake collision mortality (1.0 birds) would involve kittiwakes from the Cliffs of Moher SPA. This equates to 0.02 birds from the SPA per breeding season (1.0x0.021) (Table 4-22).

Overall, total annual kittiwake collision mortality (8.2 birds) was predicted to involve 2.6 kittiwakes from the Cliffs of Moher SPA (Table 4-22).

The kittiwake breeding population at Cliffs of Moher SPA is estimated to be 7,962 adult birds (Appendix 7), however there will also be immature birds reared at this SPA that form a component of the SPA population. Applying an immature to adult ratio of 0.898 (Horswill & Robinson, 2015), the total estimated SPA population (adults plus immatures) is 15,112 birds (Table 4-22). For this assessment the baseline annual mortality was calculated based on an estimated average kittiwake baseline mortality rate (all ages) of 0.156 (Horswill & Robinson, 2015). Applying this mortality rate, the estimated annual baseline mortality of kittiwakes at Cliffs of Moher SPA is 2,357 birds (15,112 x 0.156). The additional annual predicted mortality of 2.6 kittiwakes would increase the baseline mortality rate by 0.1%.

As highlighted by Natural England guidance, where predicted impacts equate to 1% or below of baseline mortality for a population (e.g. colony population) then this level of impact could be considered non-significant (Parker *et al.,* 2022c). As the predicted increase in annual baseline mortality for kittiwake was below 1%, PVA was not carried out on the Cliffs of Moher SPA kittiwake population, as agreed in the East Coast Phase 1 Method Statement (GoBe, 2022).

On this basis, there will be no adverse effect on the kittiwake qualifying feature of the Cliffs of Moher SPA, as defined by the COs for the site as a result of collision effects from the Offshore Site.

4.2.4.6.2 Displacement

Kittiwake

The conservation objectives (COs) for kittiwake at the Cliffs of Moher SPA are presented in Table 3-11. Displacement impacts are limited to the Operation and Maintenance phase, as turbines will not be operating in the construction or decommissioning phases. It was considered that there was no other source-pathway-receptor chain for adverse effects for the other phases of development therefore the other phases of development are not considered within this assessment.

The Cliffs of Moher SPA population of breeding kittiwakes in 1999 was 7,698 pairs (NPWS, 2024), which equates to 15,396 breeding adults. The breeding population recorded during the Seabirds Count 2015-2021 national census was 3,981 AON (7,962 breeding adults) (Appendix 7).

Recent guidance for OWF projects in Scottish waters recommended that a displacement rate of 30% should be used for kittiwakes (NatureScot, 2023), and this displacement rate has been applied for this assessment. NatureScot guidance also recommended that mortality rates of 1% and 3% throughout the year should be used for kittiwake in displacement assessments (NatureScot, 2023). These mortality rates have also been applied for this assessment. Further details of the displacement assessment approach and the seasonal displacement matrices are presented in the Displacement Assessment Appendix (Appendix 9).

Due to the low numbers of birds involved, for the purposes of this assessment, it has been assumed that all predicted mortality involved adult breeding kittiwakes, which is considered to be precautionary, as both adult and immature kittiwakes were recorded in the Offshore Ornithology Study Area on baseline surveys throughout the year (Appendix 7).

In the breeding season, the mean seasonal peak of kittiwakes in the OAA plus 2 km buffer was 93 birds. Based on a displacement rate of 30%, this would mean that an estimated 28 kittiwakes would be displaced from the OAA and 2 km buffer in the breeding season. Applying a 1% mortality rate would therefore involve 0.28 kittiwakes. Applying a 3% mortality rate would involve 0.84 kittiwakes (Table 4-20).

In the autumn migration period of the non-breeding season, the mean seasonal peak of kittiwakes in the OAA plus 2 km buffer was 79 birds. Based on a displacement rate of 30%, this would mean that an estimated 24 kittiwakes would be displaced from the OAA and 2 km buffer in the autumn migration period. Applying a 1% mortality rate would therefore involve 0.24 kittiwakes. Applying a 3% mortality rate would involve 0.72 kittiwakes (Table 4-23).

In the spring migration period of the non-breeding season, the mean seasonal peak of kittiwakes in the OAA plus 2 km buffer was 144 birds. Based on a displacement rate of 30%, this would mean that an estimated 43 kittiwakes would be displaced from the OAA and 2 km buffer in the spring migration period. Applying a 1% mortality rate would therefore involve 0.43 kittiwakes. Applying a 3% mortality rate would involve 1.29 kittiwakes (Table 4-23).

Further details and the seasonal displacement matrices are presented in the Displacement Assessment Appendix (Appendix 9).

Table 4-23 Estimated breeding season displacement mortality for kittiwakes from the Cliffs of Moher SPA

Season	Estimated mortality	Most recent population (birds)	Apportioned colony percentage	Estimated SPA mortality
30% displacement and 1% mortality rate				
Breeding (Mar-Aug)	0.28 birds	7,962	68.3%	0.19 birds
Autumn migration (Sep-Dec)	0.24 birds	15,112	1.6%	0.004 birds
Spring migration (Jan-Feb)	0.43 birds	15,112	2.1%	0.01 birds
Annual total	0.95 birds	-	-	0.2 birds
30% displacement and 3% mortality rate				
Breeding (Mar-Aug)	0.84 birds	7,962	68.3%	0.57 birds
Autumn migration (Sep-Dec)	0.72 birds	15,112	1.6%	0.01 birds

Season	Estimated mortality	Most recent population (birds)	Apportioned colony percentage	Estimated SPA mortality
Spring migration (Jan-Feb)	1.29 birds	15,112	2.1%	0.03 birds
Total	2.85 birds	-	-	0.61 birds

In the breeding season, apportioning estimated that 68.3% of estimated kittiwake displacement mortality would involve breeding kittiwakes from the Cliffs of Moher SPA. Based on a 30% displacement rate and a 1% mortality rate, this equates to 0.19 birds from the SPA per breeding season (0.28x0.683). Based on a 30% displacement rate and a 3% mortality rate, this equates to 0.57 birds from the SPA per breeding season (0.84x0.683) (Table 4-23).

In the autumn migration period of the non-breeding season, apportioning estimated that 1.6% of estimated kittiwake displacement mortality would involve kittiwakes from the Cliffs of Moher SPA. Based on a 30% displacement rate and a 1% mortality rate, this equates to 0.004 birds from the SPA per breeding season (0.24x0.016). Based on a 30% displacement rate and a 3% mortality rate, this equates to 0.01 birds from the SPA per breeding season (0.72x0.016) (Table 4-23).

In the spring migration period of the non-breeding season, apportioning estimated that 2.1% of estimated kittiwake displacement mortality would involve kittiwakes from the Cliffs of Moher SPA. Based on a 30% displacement rate and a 1% mortality rate, this equates to 0.01 birds from the SPA per breeding season (0.43x0.021). Based on a 30% displacement rate and a 3% mortality rate, this equates to 0.03 birds from the SPA per breeding season (1.29x0.021) (Table 4-23).

Overall, total annual kittiwake displacement mortality based on a 30% displacement rate and a 1% mortality rate was predicted to involve 0.2 kittiwakes from the Cliffs of Moher SPA. Based on a 30% displacement rate and a 3% mortality rate, annual kittiwake displacement mortality was predicted to involve 0.61 kittiwakes from the Cliffs of Moher SPA (Table 4-23).

The kittiwake breeding population at the Cliffs of Moher SPA is estimated to be 7,962 adult birds (Appendix 7), however there will also be immature birds reared at this SPA that form a component of the SPA population. Applying an immature to adult ratio of 0.898 (Horswill & Robinson, 2015), the total estimated SPA population (adults plus immatures) is 15,112 birds (Table 4-23). For this assessment the baseline annual mortality was calculated based on an estimated average kittiwake baseline mortality rate (all ages) of 0.156 (Horswill & Robinson, 2015). Applying this mortality rate, the estimated annual baseline mortality of kittiwakes at the Cliffs of Moher SPA is 2,357 birds (15,112 x 0.156).

Based on a 30% displacement rate and a 1% mortality rate, the additional annual predicted mortality of 0.2 kittiwakes would increase the baseline mortality rate by 0.01%. Based on a 30% displacement rate and a 3% mortality rate, the additional annual predicted mortality of 0.61 kittiwakes would increase the baseline mortality rate by 0.03%.

As highlighted by Natural England guidance, where predicted impacts equate to 1% or below of baseline mortality for a population (e.g. colony population) then this level of impact could be considered non-significant (Parker *et al.,* 2022c). As the predicted increases in annual baseline displacement mortality for kittiwake were below 1%, PVA was not carried out on the Cliffs of Moher SPA kittiwake population, as agreed in the East Coast Phase 1 Method Statement (GoBe, 2022).

On this basis, there will be no adverse effect on the kittiwake qualifying feature of the Cliffs of Moher SPA, as defined by the COs for the site as a result of displacement effects from the Offshore Site.

Guillemot

The conservation objectives (COs) for guillemot at the Cliffs of Moher SPA are presented in Table 3-11. Displacement impacts are limited to the Operation and Maintenance phase, as turbines will not be operating in the construction or decommissioning phases. It was considered that there was no other source-pathway-receptor chain for adverse effects for the other phases of development therefore the other phases of development are not considered within this assessment.

The Cliffs of Moher SPA population of breeding guillemots in 1999 was 19,962 individuals (NPWS, 2024). The breeding population recorded during the Seabirds Count 2015-2021 national census was 46,669 individuals (Appendix 7).

Based on the mean seasonal peak of guillemots in the OAA and 2 km buffer, and a displacement rate of 50% and a mortality rate of 1%, displacement mortality was predicted to be 16 birds in the breeding season (March to July). Based on a displacement rate of 60%, and a mortality rate of 3%, displacement mortality was predicted to be 58 birds in the breeding season, increasing to 96 birds, if a mortality rate of 5% is applied. It should be noted that evidence from post-construction monitoring indicates that applying displacement rates greater than 50% and mortality rates of more than 1% is overly precautionary (e.g. APEM, 2022). Further details of how displacement mortality was estimated are presented in the Displacement Assessment (Appendix 9).

However, this estimate includes non-breeding adults and immature birds, as well as breeding adults. Studies have shown that for several seabird species, in addition to breeding birds, colonies are also attended by many immature individuals and a smaller number of non-breeding adults (e.g. Wanless *et al.,* 1998). There is little information on the breakdown of immature and non-breeding adults present at a colony, however, this has been estimated using proportions from Horswill and Robinson (2015) (Appendix 7). Based on the proportion of adult guillemots from the population age ratio (0.522), 52.2% of the population present were assumed to be adult birds, with a corresponding 47.8% of the population assumed to be immature birds. This means that between eight and 50 guillemots displaced from the OAA and 2 km buffer during the breeding season would be adult birds, with between eight and 46 immature birds also displaced.

However, a proportion of adult birds present at colonies in the breeding season will opt not to breed in a particular breeding season. It has been estimated that 7% of adult guillemots may be “sabbatical” birds in any particular breeding season (Xodus, 2023), and this has been applied for this assessment. On this basis, between one and four displaced adult guillemots were considered not to be breeding, therefore guillemot mortality was considered to be between seven and 46 breeding adults, one to four non-breeding “sabbatical” adults and between eight and 46 immature birds (Table 4-24).

For the non-breeding season in the OAA and 2 km buffer, and a displacement rate of 50% and a mortality rate of 1%, displacement mortality was predicted to be two birds. Based on a displacement rate of 60%, and a mortality rate of 1%, displacement mortality was predicted to be two birds in the non-breeding season, increasing to six birds, if a mortality rate of 3% is applied (Table 4-24). Further details and the seasonal displacement matrices are presented in Appendix 9.

Table 4-24 Estimated breeding season displacement mortality for guillemots from Cliffs of Moher SPA

Season	Estimated mortality	Most recent population (birds)	Apportioned colony percentage	Estimated SPA mortality
50% displacement and 1% mortality rate				
Breeding (Mar-July)	7	46,669	52.2%	3.7 birds

Season	Estimated mortality	Most recent population (birds)	Apportioned colony percentage	Estimated SPA mortality
Non-breeding (Aug-Feb)	2	89,418	6.9%	0.14 birds
Annual total	9	-	-	3.84 birds
60% displacement and 5% mortality rate in breeding season; 3% in non-breeding season				
Breeding (Mar-July)	46	46,669	52.2%	24.0
Non-breeding (Aug-Feb)	6	89,418	6.9%	0.41 birds
Total	52	-	-	24.41 birds

In the breeding season, apportioning estimated that 52.2% of estimated guillemot displacement mortality would involve breeding guillemots from the Cliffs of Moher SPA. Based on a 50% displacement rate and a 1% mortality rate, this equates to 3.7 birds from the SPA per breeding season (7x0.522). Based on a 60% displacement rate and a 5% mortality rate, this equates to 24.0 birds from the SPA per breeding season (46x0.522) (Table 4-24).

In the non-breeding season, apportioning estimated that 6.9% of estimated guillemot displacement mortality would involve guillemots from the Cliffs of Moher SPA. Based on a 50% displacement rate and a 1% mortality rate, this equates to 0.14 birds from the SPA per non-breeding season (2x0.069). Based on a 60% displacement rate and a 5% mortality rate, this equates to 0.41 birds from the SPA per non-breeding season (6x0.069) (Table 4-24).

Overall, total annual guillemot displacement mortality based on a 50% displacement rate and a 1% mortality rate was predicted to involve 3.84 guillemots from the Cliffs of Moher SPA. Based on a 60% displacement rate and a 5% mortality rate in the breeding season and a 3% mortality rate in the non-breeding season, annual guillemot displacement mortality was predicted to involve 24.41 guillemots from the Cliffs of Moher SPA (Table 4-24).

The guillemot breeding population at Cliffs of Moher SPA is estimated to be 46,669 adult birds (Appendix 7), however there will also be immature birds reared at this SPA that form a component of the SPA population. Applying an immature to adult ratio of 0.916 (Horswill & Robinson, 2015), the total estimated SPA population (adults plus immatures) is 89,418 birds (Table 4-24). For this assessment the baseline annual mortality was calculated based on an estimated average guillemot baseline mortality rate (all ages) of 0.136 (Horswill & Robinson, 2015). Applying this mortality rate, the estimated annual baseline mortality of guillemots at Cliffs of Moher SPA is 12,161 birds (89,418x 0.136).

Based on a 50% displacement rate and a 1% mortality rate, the additional annual predicted displacement mortality of 3.7 guillemots would increase the baseline mortality rate by 0.03%. Based on a 60% displacement rate and a 5% mortality rate in the breeding season and a 3% mortality rate in the non-breeding season, the additional annual predicted displacement mortality of 24.41 guillemots would increase the baseline mortality rate by 0.2%.

As highlighted by Natural England guidance, where predicted impacts equate to 1% or below of baseline mortality for a population (e.g. colony population) then this level of impact could be considered non-significant (Parker *et al.,* 2022c). As the predicted increases in annual baseline displacement mortality for guillemot were below 1%, PVA was not carried out on the Cliffs of Moher SPA guillemot population, as agreed in the East Coast Phase 1 Method Statement (GoBe, 2022).

On this basis, there will be no adverse effect on the guillemot qualifying feature of the Cliffs of Moher SPA, as defined by the COs for the site as a result of displacement effects from the Offshore Site.

Razorbill

The conservation objectives (COs) for razorbill at the Cliffs of Moher SPA are presented in Table 3-11. Displacement impacts are limited to the Operation and Maintenance phase, as turbines will not be operating in the construction or decommissioning phases. It was considered that there was no other source-pathway-receptor chain for adverse effects for the other phases of development therefore the other phases of development are not considered within this assessment.

The Cliffs of Moher SPA population of breeding razorbills in 1999 was 7,700 individuals (NPWS, 2024). The breeding population recorded during the Seabirds Count 2015-2021 national census was 5,422 individuals (Appendix 7).

Based on the mean seasonal peak of razorbills in the OAA and 2 km buffer, and a displacement rate of 50% and a mortality rate of 1%, displacement mortality was predicted to be one bird in the breeding season. Based on a displacement rate of 60%, and a mortality rate of 3%, displacement mortality was predicted to be four birds in the breeding season, increasing to seven birds, if a mortality rate of 5% was applied. It should be noted that evidence from post-construction monitoring indicates that applying displacement rates greater than 50% and mortality rates of more than 1% is overly precautionary (e.g. APEM, 2022). Further details of how displacement mortality was estimated are presented in the Displacement Assessment (Appendix 9).

However, this estimate includes non-breeding adults and immature birds, as well as breeding adults. Studies have shown that for several seabird species, in addition to breeding birds, colonies are also attended by many immature individuals and a smaller number of non-breeding adults (e.g. Wanless *et al.,* 1998). There is little information on the breakdown of immature and non-breeding adults present at a colony, however, this has been estimated using proportions from Horswill and Robinson (2015) (Appendix 7). Based on the proportion of adult razorbills from the population age ratio, 53.3% of the population present are adult birds, with a corresponding 46.7% of the population being immature birds. This means that between one and four razorbills displaced from the OAA and 2 km buffer during the breeding season would be adult birds, with between zero and three immature birds also displaced.

However, a proportion of adult birds present at colonies in the breeding season will opt not to breed in a particular breeding season. It has been estimated that 7% of adult razorbills may be “sabbatical” birds in any particular breeding season (Xodus, 2023), and this has been applied for this assessment. However, applying this to the small number of adult razorbills predicted to suffer mortality from displacement does not change the predicted number of breeding birds, therefore razorbill mortality was considered to involve between one and four breeding adults, zero non-breeding “sabbatical” adults and zero to three immature birds (Table 4-25).

For the autumn migration period, razorbill displacement mortality was predicted to be zero birds for both 50% and 60% displacement rates and 1% and 3% mortality rates (Table 4-25).

For the winter period, based on a displacement rate of 50% and a mortality rate of 1%, displacement mortality was predicted to be one bird. Based on a displacement rate of 60%, and a mortality rate of 1%, displacement mortality was also predicted to be one bird, increasing to three birds, if a mortality rate of 3% was applied (Table 4-25).

For the spring migration period, based on a displacement rate of 50% and a mortality rate of 1%, displacement mortality was predicted to be zero birds. Based on a displacement rate of 60%, and a mortality rate of 1%, displacement mortality was also predicted to be zero birds, increasing to one bird, if a mortality rate of 3% was applied (Table 4-25). Further details and the seasonal displacement matrices are presented in the Displacement Assessment Appendix (Appendix 9).

In the breeding season, apportioning estimated that 54.9% of estimated razorbill displacement mortality would involve breeding razorbills from the Cliffs of Moher SPA. Based on a 50% displacement rate and a 1% mortality rate, this equates to 0.55 birds from the SPA per breeding season (1x0.549). Based on a 60% displacement rate and a 5% mortality rate, this equates to 2.2 birds from the SPA per breeding season (4x0.549) (Table 4-25).

In the autumn migration period of the non-breeding season, apportioning estimated that 1.6% of estimated razorbill displacement mortality would involve razorbills from the Cliffs of Moher SPA. Based on a 50% displacement rate and a 1% mortality rate, this equates to zero birds from the SPA, as zero razorbills were predicted to be displaced in the autumn migration period. Based on a 60% displacement rate and a 5% mortality rate, this also equates to zero birds from the SPA, as zero razorbills were predicted to be displaced in the autumn migration period (Table 4-25).

Table 4-25 Estimated breeding season displacement mortality for razorbills from Cliffs of Moher SPA

Season	Estimated mortality	Most recent population (birds)	Apportioned colony percentage	Estimated SPA mortality
50% displacement and 1% mortality rate				
Breeding (Apr-July)	1	5,422	54.9%	0.55 birds
Autumn migration (Aug-Oct)	0	10,172	1.6%	0 birds
Winter period (Nov-Dec)	1	10,172	2.8%	0.03 birds
Spring migration (Jan-Mar)	0	10,172	1.6%	0 birds
Annual total	2	-	-	0.58 birds
60% displacement and 5% mortality rate in breeding season; 3% in non-breeding season				
Breeding (Mar-July)	4	5,422	54.9%	2.2 birds
Autumn migration (Aug-Oct)	0	10,172	1.6%	0 birds
Winter period (Nov-Dec)	3	10,172	2.8%	0.08 birds
Spring migration (Jan-Mar)	1	10,172	1.6%	0.02 birds

Season	Estimated mortality	Most recent population (birds)	Apportioned colony percentage	Estimated SPA mortality
Total	8	-	-	2.3 birds

In the winter period of the non-breeding season, apportioning estimated that 2.8% of estimated razorbill displacement mortality would involve razorbills from the Cliffs of Moher SPA. Based on a 50% displacement rate and a 1% mortality rate, this equates to 0.03 birds from the SPA per non-breeding season (1x0.028). Based on a 60% displacement rate and a 5% mortality rate, this equates to 0.08 birds from the SPA per non-breeding season (3x0.028) (Table 4-25).

In the spring period of the non-breeding season, apportioning estimated that 1.6% of estimated razorbill displacement mortality would involve razorbills from the Cliffs of Moher SPA. Based on a 50% displacement rate and a 1% mortality rate, this equates to zero birds from the SPA, as zero razorbills were predicted to be displaced in the spring migration period. Based on a 60% displacement rate and a 5% mortality rate, this equates to 0.02 birds from the SPA per non-breeding season (1x0.016) (Table 4-25).

Overall, total annual razorbill displacement mortality based on a 50% displacement rate and a 1% mortality rate was predicted to involve 0.58 razorbills from the Cliffs of Moher SPA. Based on a 60% displacement rate and a 5% mortality rate in the breeding season and a 3% mortality rate in the non-breeding season, annual razorbill displacement mortality was predicted to involve 2.3 razorbills from the Cliffs of Moher SPA (Table 4-25).

The razorbill breeding population at Cliffs of Moher SPA is estimated to be 5,422 adult birds (Appendix 7), however there will also be immature birds reared at this SPA that form a component of the SPA population. Applying an immature to adult ratio of 0.876 (Horswill & Robinson, 2015), the total estimated SPA population (adults plus immatures) is 10,172 birds (Table 4-25). For this assessment the baseline annual mortality was calculated based on an estimated average razorbill baseline mortality rate (all ages) of 0.129 (Horswill & Robinson, 2015). Applying this mortality rate, the estimated annual baseline mortality of razorbills at Cliffs of Moher SPA is 12,161 birds (10,172 x 0.129).

Based on a 50% displacement rate and a 1% mortality rate, the additional annual predicted displacement mortality of 0.58 razorbills would increase the baseline mortality rate by 0.005%. Based on a 60% displacement rate and a 5% mortality rate in the breeding season and a 3% mortality rate in the non-breeding season, the additional annual predicted displacement mortality of 2.3 razorbills would increase the baseline mortality rate by 0.02%.

As highlighted by Natural England guidance, where predicted impacts equate to 1% or below of baseline mortality for a population (e.g. colony population) then this level of impact could be considered non-significant (Parker *et al.,* 2022c). As the predicted increases in annual baseline displacement mortality for razorbill were below 1%, PVA was not carried out on the Cliffs of Moher SPA razorbill population, as agreed in the East Coast Phase 1 Method Statement (GoBe, 2022).

On this basis, there will be no adverse effect on the razorbill qualifying feature of the Cliffs of Moher SPA, as defined by the COs for the site as a result of displacement effects from the Offshore Site.

Puffin

The conservation objectives (COs) for puffin at the Cliffs of Moher SPA are presented in Table 3-11. Displacement impacts are limited to the Operation and Maintenance phase, as turbines will not be operating in the construction or decommissioning phases. It was considered that there was no other source-pathway-receptor chain for adverse effects for the other phases of development therefore the other phases of development are not considered within this assessment.

The Cliffs of Moher SPA population of breeding puffins in1999 was 1,365 Apparently Occupied Burrows (AOB) (NPWS, 2024), which corresponds to 2,730 individuals. The breeding population recorded during the Seabirds Count 2015-2021 national census was 195 AOBs, which corresponds to 390 individuals (Appendix 7).

Based on the mean seasonal peak of puffins in the OAA and 2 km buffer, and a displacement rate of 50% and a mortality rate of 1%, displacement mortality was predicted to be zero birds in the breeding season. Based on a displacement rate of 60%, and a mortality rate of 3%, displacement mortality was predicted to be one puffin in the breeding season, increasing to two puffins, if a mortality rate of 5% was applied (Table 4-26).

For the non-breeding season in the OAA and 2 km buffer, and a displacement rate of 50% and a mortality rate of 1%, displacement mortality was predicted to be zero birds. Based on a displacement rate of 60%, and mortality rates of 1% and 3%, displacement mortality was also predicted to be zero birds (Table 4-26). Further details and the seasonal displacement matrices are presented in the Displacement Assessment Appendix 9.

Table 4-26 Estimated breeding season displacement mortality for puffins from Cliffs of Moher SPA

Season	Estimated mortality	Most recent population (birds)	Apportioned colony percentage	Estimated SPA mortality
50% displacement and 1% mortality rate				
Breeding (Apr-early Aug)	0	390	18.6%	0 birds
Non-breeding (mid-Aug-Mar)	0	719	0.2%	0 birds
Annual total	0	-	-	0
60% displacement and 5% mortality rate in breeding season; 3% in non-breeding season				
Breeding (Apr-early Aug)	2	390	18.6%	0.37 birds
Non-breeding (mid-Aug-Mar)	0	719	0.2%	0 birds
Total	2	-	-	0.37 birds

In the breeding season, apportioning estimated that 18.6% of estimated puffin displacement mortality would involve breeding puffins from the Cliffs of Moher SPA. Based on a 50% displacement rate and a 1% mortality rate, this equates to zero birds from the SPA per breeding season, as zero puffins were predicted to be displaced. Based on a 60% displacement rate and a 5% mortality rate, this equates to 0.37 birds from the SPA per breeding season (2x0.186) (Table 4-26).

In the non-breeding season, apportioning estimated that 0.2% of estimated puffin displacement mortality would involve puffins from the Cliffs of Moher SPA. Based on a 50% displacement rate and a 1%

mortality rate, this equates to zero birds from the SPA, as zero puffins were predicted to be displaced in the non-breeding season. Based on a 60% displacement rate and a 5% mortality rate, this also equates to zero birds from the SPA, as zero puffins were predicted to be displaced in the non-breeding season (Table 4-26).

Overall, total annual puffin displacement mortality based on a 50% displacement rate and a 1% mortality rate was predicted to involve zero puffins from the Cliffs of Moher SPA. Based on a 60% displacement rate and a 5% mortality rate in the breeding season and a 3% mortality rate in the non-breeding season, annual puffin displacement mortality was predicted to involve 0.37 puffins from the Cliffs of Moher SPA (Table 4-26).

The puffin breeding population at Cliffs of Moher SPA is estimated to be 390 adult birds (Appendix 7), however there will also be immature birds reared at this SPA that form a component of the SPA population. Applying an immature to adult ratio of 0.842 (Horswill & Robinson, 2015), the total estimated SPA population (adults plus immatures) is 719 birds (Table 4-26). For this assessment the baseline annual mortality was calculated based on an estimated average puffin baseline mortality rate (all ages) of 0.177 (Horswill & Robinson, 2015). Applying this mortality rate, the estimated annual baseline mortality of puffins at Cliffs of Moher SPA is 127 birds (719x 0.177).

Based on a 50% displacement rate and a 1% mortality rate, the additional annual predicted displacement mortality of zero puffins would increase the baseline mortality rate by 0%. Based on a 60% displacement rate and a 5% mortality rate in the breeding season and a 3% mortality rate in the non-breeding season, the additional annual predicted displacement mortality of 0.37 puffins would increase the baseline mortality rate by 0.29%.

As highlighted by Natural England guidance, where predicted impacts equate to 1% or below of baseline mortality for a population (e.g. colony population) then this level of impact could be considered non-significant (Parker *et al.,* 2022c). As the predicted increases in annual baseline displacement mortality for puffin were below 1%, PVA was not carried out on the Cliffs of Moher SPA puffin population, as agreed in the East Coast Phase 1 Method Statement (GoBe, 2022).

On this basis, there will be no adverse effect on the puffin qualifying feature of the Cliffs of Moher SPA, as defined by the COs for the site as a result of displacement effects from the Offshore Site.

In relation to the Cliffs of Moher SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.7 Illaunonearaun SPA (004114)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of Illaunonearaun SPA which are listed in Table 3-11.

This SPA is of conservation importance due to the presence of a wintering barnacle goose flock that exceeds the qualifying threshold for national importance (NPWS, 2024).

This SPA was screened in in the migratory CRM assessment (Appendix 6) as at least 10% of modelled migration flightlines between this SPA and Iceland and Greenland were predicted to pass through the OAA. Designated migratory QI species for each SPA were screened in based on where at least 1% of the Irish population of each species was expected to pass through the OAA each year. This was the case for barnacle goose.

Based on the above, a source-pathway-receptor chain for adverse effects on one QI species of this SPA (barnacle goose) has been identified, as a result of potential collision impacts during the Operation and Maintenance phase. These potential impacts are assessed in the following sections.

4.2.4.7.1 Collision Risk

Barnacle goose

The conservation objectives (COs) for the Illaunonearaun SPA are presented in Table 3-11. Collision impacts are limited to the Operation and Maintenance phase, as turbines will not be operating in the construction or decommissioning phases. It was considered that there was no other source-pathway-receptor chain for adverse effects for the other phases of development therefore the other phases of development are not considered within this assessment.

The population estimate of barnacle goose for Illaunonearaun SPA and the estimated proportion of the SPA population at risk of collision passing through the OAA are shown in Table 4-27. The count year is shown in brackets.

Table 4-27 Population estimates of screened-in species from Illaunonearaun SPA passing through the OAA and the proportion of birds at risk of collision for each assessed species.

Species	Population estimate	Proportion at risk of collision
Barnacle goose	<20 (2014)[a]	0.226

[a]*Lewis et al. (2019)*

The results of the mCRM for screened in species from Illaunonearaun SPA are presented in Table 4-28.

Table 4-28 Seasonal and annual collision estimates from the OAA for Illaunonearaun SPA of screened in migratory non-seabird QI species.

Species	Pre-breeding	Post-breeding	Other	Total
Barnacle goose	0.001 ± 0.000	0.001 ± 0.000	0.000 ± 0.000	0.002 ± 0.000

The analysis of migration collisions for this qualifying species for Illaunonearaun SPA show that considerably less than a single collision is expected annually. The proportion of this species using this SPA as a staging post or wintering area that are at risk of collision with the Project is extremely small.

On this basis, there will be no adverse effect on the barnacle goose qualifying feature of the Illaunonearaun SPA, as defined by the COs for the site as a result of collision effects from the Offshore Site.

In relation to the Illaunonearaun SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.8 High Island, Inishshark and Duvillaun SPA (004144)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of High Island, Inishshark and Duvillaun SPA which are listed in Table 3-11.

This SPA is of ornithological importance for its wintering barnacle goose numbers and for breeding populations of fulmars and Arctic terns (NPWS, 2024).

Fulmars are not considered to be at risk of displacement or barrier effects (e.g. Dierschke *et al.*, 2016). The species is also considered to have a low sensitivity to collisions with OWFs (e.g. Bradbury *et al.,* 2014), as birds typically fly low to the sea surface. On this basis, there is no adverse effect on this breeding QI species at this SPA.

The proposed Offshore Site lies outside the mean maximum foraging ranges of Arctic tern, therefore there is no risk that breeding adults from this SPA will be present in the OAA during the breeding season. Therefore, there will no impact on breeding Arctic terns from this SPA during the breeding season.

It is considered unlikely that individual Arctic terns from this SPA would pass through the OAA on migration, due to the distance between this SPA and the OAA (51.1 km at the nearest point). The CRM assessment estimated that annual collision totals of Arctic terns associated with the Project would be 0.2 birds per year (Appendix 6). In this basis, it is considered that any potential collision impact on individuals from this SPA passing through the OAA on spring or autumn migration would be very low. On this basis, there is no adverse effect on this breeding species at this SPA during spring and autumn migration.

Barnacle goose was screened in in Table 3-1 as being at potential risk of collision if individuals pass through the OAA on spring and autumn migration or during the winter months, when they may be present within this SPA. However, the results from the mCRM concluded that there was no connecting migratory pathway for this species between the SPA and the OAA, therefore the potential collision risk for this species would be negligible (Appendix 10). On this basis, there is no adverse effect on this non-breeding season QI species at this SPA.

In relation to the High Island, Inishshark and Duvillaun SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.9 Inner Galway Bay SPA (004031)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of Inner Galway Bay SPA which are listed in Table 3-11.

This SPA is of high ornithological importance with two wintering species having populations of international importance (great northern diver and light-bellied brent goose). In addition, there are a further sixteen wintering species that occur in nationally important numbers (black-throated diver, cormorant, grey heron, wigeon, teal, red-breasted merganser, ringed plover, golden plover, lapwing, dunlin, bar-tailed godwit, curlew, redshank, turnstone, black-headed gull and common gull). The breeding colonies of Sandwich tern, common tern and cormorant are also of national importance. In addition, the wetlands and associated waterbirds within this site are of special conservation interest for Wetland & Waterbirds (NPWS, 2024).

Black-throated diver and black-headed gull have been excluded from further assessment on the basis that these species were not recorded within the OAA on baseline surveys (Appendix 7). Where seabird species were not recorded in the OAA over the duration of site-specific baseline surveys (24 months), it is considered objectively reasonable using expert judgement to exclude them from further assessment. Seabird species that were not recorded in the OAA on baseline surveys were considered extremely unlikely to use the OAA in numbers large enough to warrant further consideration.

Common gull has been excluded from further assessment on the basis that this species was only recorded in very low numbers (annual peak count of less than 10 birds) in each year of the site-specific baseline surveys (Appendix 7). These infrequently occurring species were considered using expert judgement to be extremely unlikely to use the OAA in numbers large enough to warrant further consideration.

Grey heron is a terrestrial species and there is no pathway for this species to be at risk of adverse effects from the Offshore Site , so it is not considered further.

The Offshore Site is also outside the mean maximum foraging ranges of cormorant, common tern and Sandwich tern, therefore there is no risk that breeding adults of these species from this SPA will be present in the OAA during the breeding season. It is considered unlikely that individual common and Sandwich terns from this SPA would pass through the OAA on migration, due to the distance between this SPA and the OAA (56.5 km). On this basis, there is no adverse effect on these breeding species at this SPA.

For the remaining three species of wildfowl and eight wader species, it was considered that there was potential risk of collision if individuals of these species from this SPA passed through the OAA. However, the results from the mCRM concluded that there was no connecting migratory pathway for this SPA and the OAA, therefore the potential collision risk for these species would be negligible (Appendix 10). On this basis, there is no adverse effect on these non-breeding season QI species at this SPA.

There will be no adverse effects on the Wetlands and Waterfowl QI for this SPA as the Project avoids activity within this SPA.

As per Table 3-11, a source-pathway-receptor chain for adverse effects on one QI species of this SPA (great northern diver) has been identified, as a result of potential displacement impacts during the Operation and Maintenance phase. These potential impacts are assessed in the following sections.

4.2.4.9.1 *Displacement*

Great northern diver

The conservation objectives (COs) for the Inner Galway Bay SPA are presented in Table 3-11. Displacement impacts are limited to the Operation and Maintenance phase, as turbines will not be operating in the construction or decommissioning phases. It was considered that there was no other source-pathway-receptor chain for adverse effects for the other phases of development therefore the other phases of development are not considered within this assessment.

For this assessment, receptor sensitivity has been based on two reviews of evidence from post-construction studies at offshore wind farms. A review of vulnerability of Scottish seabirds to offshore WTG in the context of disturbance and displacement ranked great northern diver as the 3rd most sensitive out of 38 species (Furness *et al.,* 2013). Bradbury *et al.,* (2014), classified the great northern diver population vulnerability to displacement from offshore wind farms in English waters as high.

The Inner Galway Bay SPA mean non-breeding season population of great northern divers between 2011 and 2015 was 154 birds, with peak numbers recorded in January and March (Lewis *et al.,* 2019).

For great northern diver, a surrounding buffer of 4 km is recommended in the SNCB advice (SNCBs, 2022), therefore a 4 km buffer has been used in this assessment. Based on the mean seasonal peak of great northern divers in the OAA and 4 km buffer in the non-breeding season, displacement mortality was predicted to be one bird per non-breeding season, based on a displacement rate of 100% and a mortality rate of 2% (Appendix 9).

Based on the distance between this SPA and the OAA (56.5 km), it is considered unlikely that birds recorded in the OAA would be regularly commuting between the OAA and this SPA. Birds from the SPA may pass through the OAA but numbers of birds at the SPA indicate that the SPA is suitable for this species therefore it is considered unlikely that birds would leave the SPA in order to regularly forage at the OAA. Based on this, it is considered that displacement impacts on great northern divers from the Inner Galway Bay SPA arising from the OAA will be negligible.

On this basis, there will be no adverse effects on the great northern diver qualifying feature of the Inner Galway Bay SPA, as defined by the COs for the site as a result of displacement effects from the Offshore Site.

In relation to the Inner Galway Bay SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.10 Illaunnanoon SPA (004221)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of the Illaunnanoon SPA which are listed in Table 3-11.

This SPA is of conservation importance due to the presence of a breeding population of Sandwich tern that exceeds the qualifying threshold for national importance (NPWS, 2024).

Baseline surveys did not record Sandwich terns in the OAA, indicating that the OAA is not an important foraging area for this species during the breeding season. While there is potential for Sandwich tern to pass through the OAA on spring and autumn migration, there were only sightings in the 4 km buffer around the OAA in July of Year 1 when the estimated population was 65 birds, and in April and June of Year 2 when the estimated population nine birds and eight birds respectively (Appendix 7). As no birds were recorded in the OAA it was not possible to undertake CRM for this species (Appendix 6). Based on this it is considered that very small numbers of Sandwich terns are likely to pass through the OAA in spring and autumn migration and therefore it is considered that any collision impact on this species from this SPA would be very low. On this basis, there is no adverse effect on this breeding season QI species at this SPA.

In relation to the Illaunnanoon SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.11 Magharee Islands SPA (004125)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of the Magharee Islands SPA which are listed in Table 3-11.

This SPA is of high ornithological importance for six species of breeding seabirds (storm petrel, shag, common gull, common tern, Arctic tern and little tern), as well as for wintering numbers of barnacle geese (NPWS, 2024).

The Offshore Site is outside mean maximum foraging distance of breeding little terns from this SPA (Table 3-1). Therefore, it is considered that there will be no impact on little terns from this SPA during the breeding season arising from the Project.

However, there is potential for this species to pass through the OAA on spring and autumn migration. Baseline surveys did not record little terns in the OAA, and there were only sightings in the 4 km buffer in July of Year 2 when the estimated population was eight birds (Appendix 7). As no birds were recorded in the OAA it was not possible to undertake CRM for this species (Appendix 6). Based on this it is considered that very small numbers of little terns are likely to pass through the OAA in autumn migration and therefore it is considered that any collision impact on this species from this SPA would be very low. On this basis, there is no adverse effect on this breeding season QI species at this SPA.

Storm petrel and common gull have been excluded from further assessment on the basis that these species were only recorded in very low numbers (annual peak count of less than 10 birds) in each year of the site-specific baseline surveys (Appendix 7). These infrequently occurring species were considered using expert judgement to be extremely unlikely to use the OAA in numbers large enough to warrant further consideration.

The Offshore Site is also outside the mean maximum foraging ranges of breeding shags, common terns and Arctic terns from this SPA, therefore there is no risk that breeding adults of these species from this SPA will be present in the OAA during the breeding season. It is considered unlikely that individual common and Arctic terns from this SPA would pass through the OAA on migration, due to the distance between this SPA and the OAA (56 km at the nearest point), and that the OAA is to the north of this SPA, with birds migrating to and from their southern wintering grounds. On this basis, there is no adverse effect on these breeding species from this SPA.

Barnacle goose was screened in in Table 3-1 as being at potential risk of collision if individuals pass through the OAA on spring and autumn migration or during the winter months, when they may be present within this SPA. However, the results from the mCRM concluded that there was no connecting migratory pathway for this species between the SPA and the OAA, therefore the potential collision risk for this species would be negligible (Appendix 10). On this basis, there is no adverse effect on this non-breeding season QI species at this SPA.

In relation to the Magharee Islands SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.12 Clare Island SPA (004136)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of Clare Island SPA which are listed in Table 3-11.

This SPA is of high ornithological importance for six species of breeding seabirds (fulmar, shag, common gull, kittiwake, guillemot and razorbill) as well as chough (NPWS, 2024).

Common gull was screened out from further assessment on the basis that this species was only recorded in very low numbers (annual peak count of less than 10 birds) in each year of the site-specific baseline surveys. These infrequently occurring species were considered using expert judgement to be extremely unlikely to use the OAA in numbers large enough to warrant further consideration. In addition, the Offshore Site is also outside mean maximum foraging range of breeding common gulls from this SPA (Woodward *et al.,* 2019).

Fulmars are not considered to be at risk of displacement or barrier effects (e.g. Dierschke *et al.*, 2016). The species is also considered to have a low sensitivity to collisions with OWFs (e.g. Bradbury *et al.,* 2014), as birds typically fly low to the sea surface. On this basis, LSE on this breeding QI species at this SPA was screened out.

The proposed Sceirde Rocks project is outside the mean maximum foraging range of shags breeding at this SPA, therefore there is no risk that breeding adults from this SPA will be present in the OAA during the breeding season. On this basis there is no adverse effect on this breeding species at this SPA.

Chough is a terrestrial species with no connectivity pathway for this species to be at risk of adverse effects from the Offshore Site therefore this species is not considered further.

As per Table 3-11, a source-pathway-receptor chain for adverse effects on three QI species of this SPA (kittiwake, guillemot and razorbill) have been identified, as a result of potential collision and displacement impacts during the Operation and Maintenance phase. These potential impacts are assessed in the following sections.

4.2.4.12.1 Collision Risk

Kittiwake

The conservation objectives (COs) for kittiwake at the Clare Island SPA are presented in Table 3-11. Collision impacts are limited to the Operation and Maintenance phase, as turbines will not be operating in the construction or decommissioning phases. It was considered that there was no other source-pathway-receptor chain for adverse effects for the other phases of development therefore the other phases of development are not considered within this assessment.

The Clare Island SPA population of breeding kittiwakes in 1999 was 1,785 pairs (NPWS, 2024), which equates to 3,570 breeding adults. The breeding population recorded during the Seabirds Count 2015-2021 national census was 840 AON (1,680 breeding adults) (Appendix 7).

In the breeding season (March to August) the CRM assessment predicted that the mean number of kittiwake collisions per breeding season would involve 4.4 birds (Appendix 6). However, this includes non-breeding adults and immature birds, as well as breeding adults. Based on the proportion of immature kittiwakes recorded on baseline surveys in the breeding season (Appendix 7), it was assumed that 91.95% of the population present are adult birds. This would mean that an estimated 4.0 kittiwakes predicted to collide during the breeding season would be adult birds.

Similarly, a proportion of adult birds present at colonies in the breeding season will opt not to breed in a particular breeding season. It has been estimated that 10% of adult kittiwakes may be “sabbatical” birds in any particular breeding season (Xodus, 2023), and this has been applied for this assessment. On this basis, 0.4 adult kittiwakes predicted to collide was considered not to be breeding. Therefore, adult kittiwake mortality in the breeding season was considered to involve 3.6 adult breeding birds and 0.4 non-breeding adults (Table 4-29).

In the autumn migration period of the non-breeding season, the CRM assessment predicted that the mean number of kittiwake collisions would involve 2.8 birds. In the spring migration period of the non-breeding season, the CRM assessment predicted that the mean number of kittiwake collisions would involve 1.0 birds (Table 4-29).

Table 4-29 Estimated breeding season collision mortality for kittiwakes from Clare Island SPA

Season	Estimated mortality	Most recent population (birds)	Apportioned colony percentage	Estimated SPA mortality
Breeding (Mar-Aug)	3.6 breeding adults	1,680	5.1%	0.18 birds
Autumn migration	2.8 birds	3,189	0.3%	0.01 birds
Spring migration	1.0 birds	3,189	0.4%	0.004 birds
Total	8.2	-	-	0.19 birds

In the breeding season, apportioning estimated that 5.1% of estimated kittiwake collision mortality (3.6 breeding adults) would involve breeding kittiwakes from the Clare Island SPA. This equates to 0.18 birds from the SPA per breeding season (3.6x0.051) (Table 4-29).

In the autumn migration period of the non-breeding season, apportioning estimated that 0.3% of estimated kittiwake collision mortality (2.8 birds) would involve kittiwakes from the Clare Island SPA. Therefore, estimated SPA mortality was 0.01 birds in the autumn migration period (2.8x0.003) (Table 4-29).

In the spring migration period of the non-breeding season, apportioning estimated that 2.1% of estimated kittiwake collision mortality (1.0 birds) would involve kittiwakes from the Cliffs of Moher SPA. This equates to 0.004 birds from the SPA per breeding season (1.0x0.004) (Table 4-29).

Overall, total annual kittiwake collision mortality (8.2 birds) was predicted to involve 0.19 kittiwakes from the Clare Island SPA (Table 4-29).

The kittiwake breeding population at Clare Island SPA is estimated to be 1,680 adult birds (Appendix 7), however there will also be immature birds reared at this SPA that form a component of the SPA population. Applying an immature to adult ratio of 0.898 (Horswill & Robinson, 2015), the total estimated SPA population (adults plus immatures) is 3,189 birds (Table 4-29). For this assessment the baseline annual mortality was calculated based on an estimated average kittiwake baseline mortality rate (all ages) of 0.156 (Horswill & Robinson, 2015). Applying this mortality rate, the estimated annual baseline mortality of kittiwakes at Clare Island SPA is 497 birds (3,189 x 0.156). The additional annual predicted mortality of 0.19 kittiwakes would increase the baseline mortality rate by 0.04%.

As highlighted by Natural England guidance, where predicted impacts equate to 1% or below of baseline mortality for a population (e.g. colony population) then this level of impact could be considered non-significant (Parker *et al.,* 2022c). As the predicted increase in annual baseline mortality for kittiwake was below 1%, PVA was not carried out on the Clare Island SPA kittiwake population, as agreed in the East Coast Phase 1 Method Statement (GoBe, 2022).

On this basis, there will be no adverse effect on the kittiwake qualifying feature of Clare Island SPA, as defined by the COs for the site as a result of collision effects from the Offshore Site.

4.2.4.12.2 Displacement

Kittiwake

The conservation objectives (COs) for kittiwake at the Clare Island SPA are presented in Table 3-11. Displacement impacts are limited to the Operation and Maintenance phase, as turbines will not be operating in the construction or decommissioning phases. It was considered that there was no other source-pathway-receptor chain for adverse effects for the other phases of development therefore the other phases of development are not considered within this assessment.

The Clare Island SPA population of breeding kittiwakes in 1999 was 1,785 pairs (NPWS, 2024), which equates to 3,570 breeding adults. The breeding population recorded during the Seabirds Count 2015-2021 national census was 840 AON (1,680 breeding adults) (Appendix 7).

Recent guidance for OWF projects in Scottish waters recommended that a displacement rate of 30% should be used for kittiwakes (NatureScot, 2023), and this displacement rate has been applied for this assessment. NatureScot guidance also recommended that mortality rates of 1% and 3% throughout the year should be used for kittiwake in displacement assessments (NatureScot, 2023). These mortality rates have also been applied for this assessment. Further details of the displacement assessment approach and the seasonal displacement matrices are presented in the Displacement Assessment Appendix (Appendix 9).

Due to the low numbers of birds involved, for the purposes of this assessment, it has been assumed that all predicted mortality involved adult breeding kittiwakes, which is considered to be precautionary, as both adult and immature kittiwakes were recorded in the Offshore Ornithology Study Area on baseline surveys throughout the year (Appendix 7).

In the breeding season, the mean seasonal peak of kittiwakes in the OAA plus 2 km buffer was 93 birds. Based on a displacement rate of 30%, this would mean that an estimated 28 kittiwakes would be displaced from the OAA and 2 km buffer in the breeding season. Applying a 1% mortality rate would therefore involve 0.28 kittiwakes. Applying a 3% mortality rate would involve 0.84 kittiwakes (Table 4-30).

In the autumn migration period of the non-breeding season, the mean seasonal peak of kittiwakes in the OAA plus 2 km buffer was 79 birds. Based on a displacement rate of 30%, this would mean that an estimated 24 kittiwakes would be displaced from the OAA and 2 km buffer in the autumn migration period. Applying a 1% mortality rate would therefore involve 0.24 kittiwakes. Applying a 3% mortality rate would involve 0.72 kittiwakes (Table 4-30).

In the spring migration period of the non-breeding season, the mean seasonal peak of kittiwakes in the OAA plus 2 km buffer was 144 birds. Based on a displacement rate of 30%, this would mean that an estimated 43 kittiwakes would be displaced from the OAA and 2 km buffer in the spring migration period. Applying a 1% mortality rate would therefore involve 0.43 kittiwakes. Applying a 3% mortality rate would involve 1.29 kittiwakes (Table 4-30).

Further details and the seasonal displacement matrices are presented in the Displacement Assessment Appendix (Appendix 9).

Table 4-30 Estimated breeding season displacement mortality for kittiwakes from the Clare Island SPA

Season	Estimated mortality	Most recent population (birds)	Apportioned colony percentage	Estimated SPA mortality
30% displacement and 1% mortality rate				
Breeding (Mar-Aug)	0.28 birds	1,680	5.1%	0.014 birds
Autumn migration (Sep-Dec)	0.24 birds	3,189	0.3%	0.0007 birds
Spring migration (Jan-Feb)	0.43 birds	3,189	0.4%	0.002 birds
Annual total	0.95 birds	-	-	0.02 birds
30% displacement and 3% mortality rate				
Breeding (Mar-Aug)	0.84 birds	1,680	5.1%	0.043 birds
Autumn migration (Sep-Dec)	0.72 birds	3,189	0.3%	0.022 birds
Spring migration (Jan-Feb)	1.29 birds	3,189	0.4%	0.005 birds
Total	2.85 birds	-	-	0.07 birds

In the breeding season, apportioning estimated that 5.1% of estimated kittiwake displacement mortality would involve breeding kittiwakes from the Clare Island SPA. Based on a 30% displacement rate and a 1% mortality rate, this equates to 0.014 birds from the SPA per breeding season (0.28x0.051). Based on a 30% displacement rate and a 3% mortality rate, this equates to 0.043 birds from the SPA per breeding season (0.84x0.051) (Table 4-30).

In the autumn migration period of the non-breeding season, apportioning estimated that 0.3% of estimated kittiwake displacement mortality would involve kittiwakes from the Clare Island SPA. Based on a 30% displacement rate and a 1% mortality rate, this equates to 0.0007 birds from the SPA per breeding season (0.24x0.003). Based on a 30% displacement rate and a 3% mortality rate, this equates to 0.022 birds from the SPA per breeding season (0.72x0.003) (Table 4-30).

In the spring migration period of the non-breeding season, apportioning estimated that 0.4% of estimated kittiwake displacement mortality would involve kittiwakes from the Clare Island SPA. Based on a 30% displacement rate and a 1% mortality rate, this equates to 0.002 birds from the SPA per breeding season (0.43x0.004). Based on a 30% displacement rate and a 3% mortality rate, this equates to 0.005 birds from the SPA per breeding season (1.29x0.004) (Table 4-30).

Overall, total annual kittiwake displacement mortality based on a 30% displacement rate and a 1% mortality rate was predicted to involve 0.02 kittiwakes from the Clare Island SPA. Based on a 30% displacement rate and a 3% mortality rate, annual kittiwake displacement mortality was predicted to involve 0.07 kittiwakes from the Clare Island SPA (Table 4-30).

The kittiwake breeding population at the Clare Island SPA is estimated to be 1,680 adult birds (Appendix 7), however there will also be immature birds reared at this SPA that form a component of the SPA population. Applying an immature to adult ratio of 0.898 (Horswill & Robinson, 2015), the total estimated SPA population (adults plus immatures) is 3,189 birds (Table 4-30). For this assessment the baseline annual mortality was calculated based on an estimated average kittiwake baseline mortality rate (all ages) of 0.156 (Horswill & Robinson, 2015). Applying this mortality rate, the estimated annual baseline mortality of kittiwakes at the Clare Island SPA is 497 birds (3,189 x 0.156).

Based on a 30% displacement rate and a 1% mortality rate, the additional annual predicted mortality of 0.02 kittiwakes would increase the baseline mortality rate by 0.004%. Based on a 30% displacement rate and a 3% mortality rate, the additional annual predicted mortality of 0.07 kittiwakes would increase the baseline mortality rate by 0.014%.

As highlighted by Natural England guidance, where predicted impacts equate to 1% or below of baseline mortality for a population (e.g. colony population) then this level of impact could be considered non-significant (Parker *et al.,* 2022c). As the predicted increases in annual baseline displacement mortality for kittiwake were below 1%, PVA was not carried out on the Clare Island SPA kittiwake population, as agreed in the East Coast Phase 1 Method Statement (GoBe, 2022).

On this basis, there will be no adverse effect on the kittiwake qualifying feature of the Clare Island SPA, as defined by the COs for the site as a result of displacement effects from the Offshore Site.

Guillemot

The conservation objectives (COs) for guillemot at Clare Island SPA are presented in Table 3-11. Displacement impacts are limited to the Operation and Maintenance phase, as turbines will not be operating in the construction or decommissioning phases. It was considered that there was no other source-pathway-receptor chain for adverse effects for the other phases of development therefore the other phases of development are not considered within this assessment.

The Clare Island SPA population of breeding guillemots in 1999 was 3,681 individuals (NPWS, 2024). The breeding population recorded during the Seabirds Count 2015-2021 national census was 2,785 individuals (Appendix 7).

Based on the mean seasonal peak of guillemots in the OAA and 2 km buffer, and a displacement rate of 50% and a mortality rate of 1%, displacement mortality was predicted to be 16 birds in the breeding season (March to July). Based on a displacement rate of 60%, and a mortality rate of 3%, displacement mortality was predicted to be 58 birds in the breeding season, increasing to 96 birds, if a mortality rate of 5% is applied. It should be noted that evidence from post-construction monitoring indicates that applying displacement rates greater than 50% and mortality rates of more than 1% is overly precautionary (e.g. APEM, 2022). Further details of how displacement mortality was estimated are presented in the Displacement Assessment (Appendix 9).

However, this estimate includes non-breeding adults and immature birds, as well as breeding adults. Studies have shown that for several seabird species, in addition to breeding birds, colonies are also attended by many immature individuals and a smaller number of non-breeding adults (e.g. Wanless *et al.,* 1998). There is little information on the breakdown of immature and non-breeding adults present at a colony, however, this has been estimated using proportions from Horswill and Robinson (2015) (Appendix 7). Based on the proportion of adult guillemots from the population age ratio (0.522), 52.2% of the population present were assumed to be adult birds, with a corresponding 47.8% of the population assumed to be immature birds. This means that between eight and 50 guillemots displaced from the OAA and 2 km buffer during the breeding season would be adult birds, with between eight and 46 immature birds also displaced.

However, a proportion of adult birds present at colonies in the breeding season will opt not to breed in a particular breeding season. It has been estimated that 7% of adult guillemots may be “sabbatical” birds in any particular breeding season (Xodus, 2023), and this has been applied for this assessment. On this basis, between one and four displaced adult guillemots were considered not to be breeding, therefore guillemot mortality was considered to be between seven and 46 breeding adults, one to four non-breeding “sabbatical” adults and between eight and 46 immature birds (Table 4-31).

For the non-breeding season in the OAA and 2 km buffer, and a displacement rate of 50% and a mortality rate of 1%, displacement mortality was predicted to be two birds. Based on a displacement rate of 60%, and a mortality rate of 1%, displacement mortality was predicted to be two birds in the non-breeding season, increasing to six birds, if a mortality rate of 3% is applied (Table 4-31). Further details and the seasonal displacement matrices are presented in Appendix 9.

Table 4-31 Estimated breeding season displacement mortality for guillemots from the Clare Island SPA

Season	Estimated mortality	Most recent population (birds)	Apportioned colony percentage	Estimated SPA mortality
50% displacement and 1% mortality rate				
Breeding (Mar-July)	7	2,785	0.6%	0.04 birds
Non-breeding (Aug-Feb)	2	5,337	0.4%	0.01 birds
Annual total	9	-	-	0.05 birds
60% displacement and 5% mortality rate in breeding season; 3% in non-breeding season				
Breeding (Mar-July)	46	2,785	0.6%	0.28 birds

Season	Estimated mortality	Most recent population (birds)	Apportioned colony percentage	Estimated SPA mortality
Non-breeding (Aug-Feb)	6	5,337	0.4%	0.02 birds
Total	52	-	-	0.3

In the breeding season, apportioning estimated that 0.6% of estimated guillemot displacement mortality would involve breeding guillemots from the Clare Island SPA. Based on a 50% displacement rate and a 1% mortality rate, this equates to 0.04 birds from the SPA per breeding season (7x0.006). Based on a 60% displacement rate and a 5% mortality rate, this equates to 0.28 birds from the SPA per breeding season (46x0.006) (Table 4-31).

In the non-breeding season, apportioning estimated that % of estimated guillemot displacement mortality would involve guillemots from the Clare Island SPA. Based on a 50% displacement rate and a 1% mortality rate, this equates to 0.01 birds from the SPA per non-breeding season (2x0.004). Based on a 60% displacement rate and a 5% mortality rate, this equates to 0.02 birds from the SPA per non-breeding season (6x0.004) (Table 4-31).

Overall, total annual guillemot displacement mortality based on a 50% displacement rate and a 1% mortality rate was predicted to involve 0.05 guillemots from the Clare Island SPA. Based on a 60% displacement rate and a 5% mortality rate in the breeding season and a 3% mortality rate in the non-breeding season, annual guillemot displacement mortality was predicted to involve 0.3 guillemots from the Clare Island SPA (Table 4-31).

The guillemot breeding population at the Clare Island SPA is estimated to be 2,785 adult birds (Appendix 7), however there will also be immature birds reared at this SPA that form a component of the SPA population. Applying an immature to adult ratio of 0.916 (Horswill & Robinson, 2015), the total estimated SPA population (adults plus immatures) is 5,337 birds (Table 4-31). For this assessment the baseline annual mortality was calculated based on an estimated average guillemot baseline mortality rate (all ages) of 0.136 (Horswill & Robinson, 2015). Applying this mortality rate, the estimated annual baseline mortality of guillemots at the Clare Island SPA is 726 birds (5,337x 0.136).

Based on a 50% displacement rate and a 1% mortality rate, the additional annual predicted displacement mortality of 0.05 guillemots would increase the baseline mortality rate by 0.007%. Based on a 60% displacement rate and a 5% mortality rate in the breeding season and a 3% mortality rate in the non-breeding season, the additional annual predicted displacement mortality of 0.3 guillemots would increase the baseline mortality rate by 0.04%.

As highlighted by Natural England guidance, where predicted impacts equate to 1% or below of baseline mortality for a population (e.g. colony population) then this level of impact could be considered non-significant (Parker *et al.,* 2022c). As the predicted increases in annual baseline displacement mortality for guillemot were below 1%, PVA was not carried out on the Clare Island SPA guillemot population, as agreed in the East Coast Phase 1 Method Statement (GoBe, 2022).

On this basis, there will be no adverse effect on the guillemot qualifying feature of Clare Island SPA, as defined by the COs for the site as a result of displacement effects from the Offshore Site.

Razorbill

The conservation objectives (COs) for razorbill at the Clare Island SPA are presented in Table 3-11. Displacement impacts are limited to the Operation and Maintenance phase, as turbines will not be operating in the construction or decommissioning phases. It was considered that there was no other source-pathway-receptor chain for adverse effects for the other phases of development therefore the other phases of development are not considered within this assessment.

The Clare Island SPA population of breeding razorbills in 1999 was 528 individuals (NPWS, 2024). The breeding population recorded during the Seabirds Count 2015-2021 national census was 829 individuals (Appendix 7).

Based on the mean seasonal peak of razorbills in the OAA and 2 km buffer, and a displacement rate of 50% and a mortality rate of 1%, displacement mortality was predicted to be one bird in the breeding season. Based on a displacement rate of 60%, and a mortality rate of 3%, displacement mortality was predicted to be four birds in the breeding season, increasing to seven birds, if a mortality rate of 5% was applied. It should be noted that evidence from post-construction monitoring indicates that applying displacement rates greater than 50% and mortality rates of more than 1% is overly precautionary (e.g. APEM, 2022). Further details of how displacement mortality was estimated are presented in the Displacement Assessment (Appendix 9).

However, this estimate includes non-breeding adults and immature birds, as well as breeding adults. Studies have shown that for several seabird species, in addition to breeding birds, colonies are also attended by many immature individuals and a smaller number of non-breeding adults (e.g. Wanless *et al.,* 1998). There is little information on the breakdown of immature and non-breeding adults present at a colony, however, this has been estimated using proportions from Horswill and Robinson (2015) (Appendix 7). Based on the proportion of adult razorbills from the population age ratio, 53.3% of the population present are adult birds, with a corresponding 46.7% of the population being immature birds. This means that between one and four razorbills displaced from the OAA and 2 km buffer during the breeding season would be adult birds, with between zero and three immature birds also displaced.

However, a proportion of adult birds present at colonies in the breeding season will opt not to breed in a particular breeding season. It has been estimated that 7% of adult razorbills may be “sabbatical” birds in any particular breeding season (Xodus, 2023), and this has been applied for this assessment. However, applying this to the small number of adult razorbills predicted to suffer mortality from displacement does not change the predicted number of breeding birds, therefore razorbill mortality was considered to involve between one and four breeding adults, zero non-breeding “sabbatical” adults and zero to three immature birds (Table 4-32).

For the autumn migration period, razorbill displacement mortality was predicted to be zero birds for both 50% and 60% displacement rates and 1% and 3% mortality rates (Table 4-32).

For the winter period, based on a displacement rate of 50% and a mortality rate of 1%, displacement mortality was predicted to be one bird. Based on a displacement rate of 60%, and a mortality rate of 1%, displacement mortality was also predicted to be one bird, increasing to three birds, if a mortality rate of 3% was applied (Table 4-32).

Table 4-32 Estimated breeding season displacement mortality for razorbills from the Clare Island SPA

Season	Estimated mortality	Most recent population (birds)	Apportioned colony percentage	Estimated SPA mortality
50% displacement and 1% mortality rate				
Breeding (Apr-July)	1	829	1.9%	0.02 birds
Autumn migration (Aug-Oct)	0	1,556	0.2%	0 birds

Season	Estimated mortality	Most recent population (birds)	Apportioned colony percentage	Estimated SPA mortality
Winter period (Nov-Dec)	1	1,556	0.4%	0.004 birds
Spring migration (Jan-Mar)	0	1,556	0.2%	0 birds
Annual total	2	-	-	0.024 birds
60% displacement and 5% mortality rate in breeding season; 3% in non-breeding season				
Breeding (Mar-July)	4	829	1.9%	0.08 birds
Autumn migration (Aug-Oct)	0	1,556	0.2%	0 birds
Winter period (Nov-Dec)	3	1,556	0.4%	0.012 birds
Spring migration (Jan-Mar)	1	1,556	0.2%	0.002 birds
Total	8	-	-	0.09 birds

For the spring migration period, based on a displacement rate of 50% and a mortality rate of 1%, displacement mortality was predicted to be zero birds. Based on a displacement rate of 60%, and a mortality rate of 1%, displacement mortality was also predicted to be zero birds, increasing to one bird, if a mortality rate of 3% was applied (Table 4-32). Further details and the seasonal displacement matrices are presented in the Displacement Assessment Appendix (Appendix 9).

In the breeding season, apportioning estimated that 1.9% of estimated razorbill displacement mortality would involve breeding razorbills from the Clare Island SPA. Based on a 50% displacement rate and a 1% mortality rate, this equates to 0.02 birds from the SPA per breeding season (1x0.019). Based on a 60% displacement rate and a 5% mortality rate, this equates to 0.08 birds from the SPA per breeding season (4x0.019) (Table 4-32).

In the autumn migration period of the non-breeding season, apportioning estimated that 0.2% of estimated razorbill displacement mortality would involve razorbills from the Clare Island SPA. Based on a 50% displacement rate and a 1% mortality rate, this equates to zero birds from the SPA, as zero razorbills were predicted to be displaced in the autumn migration period. Based on a 60% displacement rate and a 5% mortality rate, this also equates to zero birds from the SPA, as zero razorbills were predicted to be displaced in the autumn migration period (Table 4-32).

In the winter period of the non-breeding season, apportioning estimated that 0.4% of estimated razorbill displacement mortality would involve razorbills from the Clare Island SPA. Based on a 50% displacement rate and a 1% mortality rate, this equates to 0.004 birds from the SPA per non-breeding season (1x0.004). Based on a 60% displacement rate and a 5% mortality rate, this equates to 0.012 birds from the SPA per non-breeding season (3x0.004) (Table 4-32).

In the spring period of the non-breeding season, apportioning estimated that 0.2% of estimated razorbill displacement mortality would involve razorbills from the Clare Island SPA. Based on a 50% displacement rate and a 1% mortality rate, this equates to zero birds from the SPA, as zero razorbills were predicted to be displaced in the spring migration period. Based on a 60% displacement rate and a 5% mortality rate, this equates to 0.002 birds from the SPA per non-breeding season (1x0.002) (Table 4-32).

Overall, total annual razorbill displacement mortality based on a 50% displacement rate and a 1% mortality rate was predicted to involve 0.024 razorbills from the Clare Island SPA. Based on a 60% displacement rate and a 5% mortality rate in the breeding season and a 3% mortality rate in the non-breeding season, annual razorbill displacement mortality was predicted to involve 0.09 razorbills from the Clare Island SPA (Table 4-32).

The razorbill breeding population at the Clare Island SPA is estimated to be 829 adult birds (Appendix 7), however there will also be immature birds reared at this SPA that form a component of the SPA population. Applying an immature to adult ratio of 0.876 (Horswill & Robinson, 2015), the total estimated SPA population (adults plus immatures) is 1,556 birds (Table 4-32). For this assessment the baseline annual mortality was calculated based on an estimated average razorbill baseline mortality rate (all ages) of 0.129 (Horswill & Robinson, 2015). Applying this mortality rate, the estimated annual baseline mortality of razorbills at the Clare Island SPA is 107 birds (829 x 0.129).

Based on a 50% displacement rate and a 1% mortality rate, the additional annual predicted displacement mortality of 0.024 razorbills would increase the baseline mortality rate by 0.02%. Based on a 60% displacement rate and a 5% mortality rate in the breeding season and a 3% mortality rate in the non-breeding season, the additional annual predicted displacement mortality of 0.09 razorbills would increase the baseline mortality rate by 0.08%.

As highlighted by Natural England guidance, where predicted impacts equate to 1% or below of baseline mortality for a population (e.g. colony population) then this level of impact could be considered non-significant (Parker *et al.,* 2022c). As the predicted increases in annual baseline displacement mortality for razorbill were below 1%, PVA was not carried out on the Clare Island SPA razorbill population, as agreed in the East Coast Phase 1 Method Statement (GoBe, 2022).

On this basis, there will be no adverse effect on the razorbill qualifying feature of the Clare Island SPA, as defined by the COs for the site as a result of displacement effects from the Offshore Site.

In relation to the Clare Island SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.13 Loop Head SPA (004119)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of the Loop Head SPA which are listed in Table 3-11.

This SPA is of high ornithological importance as it supports two seabird species, kittiwake and guillemot, with populations of national importance (NPWS, 2024).

As per Table 3-4, a source-pathway-receptor chain for adverse effects on two QI species of this SPA (kittiwake and guillemot) have been identified, as a result of potential collision and displacement impacts during the Operation and Maintenance phase. These potential impacts are assessed in the following sections.

4.2.4.13.1 Collision Risk

Kittiwake

The conservation objectives (COs) for kittiwake at the Loop Head SPA are presented in Table 3-11. Collision impacts are limited to the Operation and Maintenance phase, as turbines will not be operating in the construction or decommissioning phases. It was considered that there was no other source-pathway-receptor chain for adverse effects for the other phases of development therefore the other phases of development are not considered within this assessment.

The Loop Head SPA population of breeding kittiwakes in 1987 was 690 pairs (NPWS, 2024), which equates to 1,380 breeding adults. The breeding population recorded during the Seabirds Count 2015-2021 national census was 1,221 AON (2,442 breeding adults) (Appendix 7).

In the breeding season (March to August) the CRM assessment predicted that the mean number of kittiwake collisions per breeding season would involve 4.4 birds (Appendix 6). However, this includes non-breeding adults and immature birds, as well as breeding adults. Based on the proportion of immature kittiwakes recorded on baseline surveys in the breeding season (Appendix 7), it was assumed that 91.95% of the population present are adult birds. This would mean that an estimated 4.0 kittiwakes predicted to collide during the breeding season would be adult birds.

Similarly, a proportion of adult birds present at colonies in the breeding season will opt not to breed in a particular breeding season. It has been estimated that 10% of adult kittiwakes may be “sabbatical” birds in any particular breeding season (Xodus, 2023), and this has been applied for this assessment. On this basis, 0.4 adult kittiwakes predicted to collide was considered not to be breeding. Therefore, adult kittiwake mortality in the breeding season was considered to involve 3.6 adult breeding birds and 0.4 non-breeding adults (Table 4-33).

In the autumn migration period of the non-breeding season, the CRM assessment predicted that the mean number of kittiwake collisions would involve 2.8 birds. In the spring migration period of the non-breeding season, the CRM assessment predicted that the mean number of kittiwake collisions would involve 1.0 birds (Table 4-33).

Table 4-33 Estimated breeding season collision mortality for kittiwakes from the Loop Head SPA

Season	Estimated mortality	Most recent population (birds)	Apportioned colony percentage	Estimated SPA mortality
Breeding (Mar-Aug)	3.6 breeding adults	2,442	6.3%	0.23 birds
Autumn migration	2.8 birds	4,635	0.5%	0.01 birds
Spring migration	1.0 birds	4,635	0.6%	0.006 birds
Total	8.2	-	-	0.25 birds

In the breeding season, apportioning estimated that 6.3% of estimated kittiwake collision mortality (3.6 breeding adults) would involve breeding kittiwakes from the Loop Head SPA. This equates to 0.23 birds from the SPA per breeding season (3.6x0.063) (Table 4-33).

In the autumn migration period of the non-breeding season, apportioning estimated that 0.5% of estimated kittiwake collision mortality (2.8 birds) would involve kittiwakes from the Loop Head SPA.

Therefore, estimated SPA mortality was 0.01 birds in the autumn migration period (2.8x0.005) (Table 4-33).

In the spring migration period of the non-breeding season, apportioning estimated that 0.6% of estimated kittiwake collision mortality (1.0 birds) would involve kittiwakes from the Loop Head SPA. This equates to 0.006 birds from the SPA per breeding season (1.0x0.006) (Table 4-33).

Overall, total annual kittiwake collision mortality (8.2 birds) was predicted to involve 0.25 kittiwakes from the Loop Head SPA (Table 4-33).

The kittiwake breeding population at the Loop Head SPA is estimated to be 2,442 adult birds (Appendix 7), however there will also be immature birds reared at this SPA that form a component of the SPA population. Applying an immature to adult ratio of 0.898 (Horswill & Robinson, 2015), the total estimated SPA population (adults plus immatures) is 4,635 birds (Table 4-33). For this assessment the baseline annual mortality was calculated based on an estimated average kittiwake baseline mortality rate (all ages) of 0.156 (Horswill & Robinson, 2015). Applying this mortality rate, the estimated annual baseline mortality of kittiwakes at Loop Head SPA is 723 birds (4,635 x 0.156). The additional annual predicted mortality of 0.25 kittiwakes would increase the baseline mortality rate by 0.03%.

As highlighted by Natural England guidance, where predicted impacts equate to 1% or below of baseline mortality for a population (e.g. colony population) then this level of impact could be considered non-significant (Parker *et al.,* 2022c). As the predicted increase in annual baseline mortality for kittiwake was below 1%, PVA was not carried out on the Loop Head SPA kittiwake population, as agreed in the East Coast Phase 1 Method Statement (GoBe, 2022).

On this basis, there will be no adverse effect on the kittiwake qualifying feature of the Loop Head SPA, as defined by the COs for the site as a result of collision effects from the Offshore Site.

4.2.4.13.2 Displacement

Kittiwake

The conservation objectives (COs) for kittiwake at the Loop Head SPA are presented in Table 3-11. Displacement impacts are limited to the Operation and Maintenance phase, as turbines will not be operating in the construction or decommissioning phases. It was considered that there was no other source-pathway-receptor chain for adverse effects for the other phases of development therefore the other phases of development are not considered within this assessment.

The Loop Head SPA population of breeding kittiwakes in 1987 was 690 pairs (NPWS, 2024), which equates to 1,380 breeding adults. The breeding population recorded during the Seabirds Count 2015-2021 national census was 1,221 AON (2,442 breeding adults) (Appendix 7).

Recent guidance for OWF projects in Scottish waters recommended that a displacement rate of 30% should be used for kittiwakes (NatureScot, 2023), and this displacement rate has been applied for this assessment. NatureScot guidance also recommended that mortality rates of 1% and 3% throughout the year should be used for kittiwake in displacement assessments (NatureScot, 2023). These mortality rates have also been applied for this assessment. Further details of the displacement assessment approach and the seasonal displacement matrices are presented in the Displacement Assessment Appendix (Appendix 9).

Due to the low numbers of birds involved, for the purposes of this assessment, it has been assumed that all predicted mortality involved adult breeding kittiwakes, which is considered to be precautionary, as both adult and immature kittiwakes were recorded in the Offshore Ornithology Study Area on baseline surveys throughout the year (Appendix 7).

In the breeding season, the mean seasonal peak of kittiwakes in the OAA plus 2 km buffer was 93 birds. Based on a displacement rate of 30%, this would mean that an estimated 28 kittiwakes would be displaced from the OAA and 2 km buffer in the breeding season. Applying a 1% mortality rate would therefore involve 0.28 kittiwakes. Applying a 3% mortality rate would involve 0.84 kittiwakes (Table 4-34).

In the autumn migration period of the non-breeding season, the mean seasonal peak of kittiwakes in the OAA plus 2 km buffer was 79 birds. Based on a displacement rate of 30%, this would mean that an estimated 24 kittiwakes would be displaced from the OAA and 2 km buffer in the autumn migration period. Applying a 1% mortality rate would therefore involve 0.24 kittiwakes. Applying a 3% mortality rate would involve 0.72 kittiwakes (Table 4-34).

In the spring migration period of the non-breeding season, the mean seasonal peak of kittiwakes in the OAA plus 2 km buffer was 144 birds. Based on a displacement rate of 30%, this would mean that an estimated 43 kittiwakes would be displaced from the OAA and 2 km buffer in the spring migration period. Applying a 1% mortality rate would therefore involve 0.43 kittiwakes. Applying a 3% mortality rate would involve 1.29 kittiwakes (Table 4-34).

Further details and the seasonal displacement matrices are presented in the Displacement Assessment Appendix (Appendix 9).

Table 4-34 Estimated breeding season displacement mortality for kittiwakes from the Loop Head SPA

Season	Estimated mortality	Most recent population (birds)	Apportioned colony percentage	Estimated SPA mortality
30% displacement and 1% mortality rate				
Breeding (Mar-Aug)	0.28 birds	2,442	6.3%	0.02 birds
Autumn migration (Sep-Dec)	0.24 birds	4,635	0.5%	0.001 birds
Spring migration (Jan-Feb)	0.43 birds	4,635	0.6%	0.003 birds
Annual total	0.95 birds	-	-	0.02 birds
30% displacement and 3% mortality rate				
Breeding (Mar-Aug)	0.84 birds	2,442	6.3%	0.05 birds
Autumn migration (Sep-Dec)	0.72 birds	4,635	0.5%	0.004 birds
Spring migration (Jan-Feb)	1.29 birds	4,635	0.6%	0.008 birds
Total	2.85 birds	-	-	0.06 birds

In the breeding season, apportioning estimated that 6.3% of estimated kittiwake displacement mortality would involve breeding kittiwakes from the Loop Head SPA. Based on a 30% displacement rate and a 1% mortality rate, this equates to 0.02 birds from the SPA per breeding season (0.28x0.063). Based on a 30% displacement rate and a 3% mortality rate, this equates to 0.05 birds from the SPA per breeding season (0.84x0.063) (Table 4-34).

In the autumn migration period of the non-breeding season, apportioning estimated that 0.5% of estimated kittiwake displacement mortality would involve kittiwakes from the Loop Head SPA. Based on a 30% displacement rate and a 1% mortality rate, this equates to 0.001 birds from the SPA per breeding season (0.24x0.005). Based on a 30% displacement rate and a 3% mortality rate, this equates to 0.004 birds from the SPA per breeding season (0.72x0.005) (Table 4-34).

In the spring migration period of the non-breeding season, apportioning estimated that 0.6% of estimated kittiwake displacement mortality would involve kittiwakes from the Loop Head SPA. Based on a 30% displacement rate and a 1% mortality rate, this equates to 0.003 birds from the SPA per breeding season (0.43x0.006). Based on a 30% displacement rate and a 3% mortality rate, this equates to 0.008 birds from the SPA per breeding season (1.29x0.006) (Table 4-34).

Overall, total annual kittiwake displacement mortality based on a 30% displacement rate and a 1% mortality rate was predicted to involve 0.02 kittiwakes from the Loop Head SPA. Based on a 30% displacement rate and a 3% mortality rate, annual kittiwake displacement mortality was predicted to involve 0.06 kittiwakes from the Loop Head SPA (Table 4-34).

The kittiwake breeding population at the Loop Head SPA is estimated to be 2,442 adult birds (Appendix 7), however there will also be immature birds reared at this SPA that form a component of the SPA population. Applying an immature to adult ratio of 0.898 (Horswill & Robinson, 2015), the total estimated SPA population (adults plus immatures) is 4,635 birds (Table 4-34). For this assessment the baseline annual mortality was calculated based on an estimated average kittiwake baseline mortality rate (all ages) of 0.156 (Horswill & Robinson, 2015). Applying this mortality rate, the estimated annual baseline mortality of kittiwakes at the Loop Head SPA is 723 birds (4,635 x 0.156).

Based on a 30% displacement rate and a 1% mortality rate, the additional annual predicted mortality of 0.02 kittiwakes would increase the baseline mortality rate by 0.003%. Based on a 30% displacement rate and a 3% mortality rate, the additional annual predicted mortality of 0.06 kittiwakes would increase the baseline mortality rate by 0.008%.

As highlighted by Natural England guidance, where predicted impacts equate to 1% or below of baseline mortality for a population (e.g. colony population) then this level of impact could be considered non-significant (Parker *et al.,* 2022c). As the predicted increases in annual baseline displacement mortality for kittiwake were below 1%, PVA was not carried out on the Loop Head SPA kittiwake population, as agreed in the East Coast Phase 1 Method Statement (GoBe, 2022).

On this basis, there will be no adverse effect on the kittiwake qualifying feature of the Loop Head SPA, as defined by the COs for the site as a result of displacement effects from the Offshore Site.

Guillemot

The conservation objectives (COs) for guillemot at the Loop Head SPA are presented in Table 3-11. Displacement impacts are limited to the Operation and Maintenance phase, as turbines will not be operating in the construction or decommissioning phases. It was considered that there was no other source-pathway-receptor chain for adverse effects for the other phases of development therefore the other phases of development are not considered within this assessment.

The Loop Head SPA population of breeding guillemots in 1999 was 5,000 individuals (NPWS, 2024). The breeding population recorded during the Seabirds Count 2015-2021 national census was 10,331 individuals (Appendix 7).

Based on the mean seasonal peak of guillemots in the OAA and 2 km buffer, and a displacement rate of 50% and a mortality rate of 1%, displacement mortality was predicted to be 16 birds in the breeding season (March to July). Based on a displacement rate of 60%, and a mortality rate of 3%, displacement mortality was predicted to be 58 birds in the breeding season, increasing to 96 birds, if a mortality rate of 5% is applied. It should be noted that evidence from post-construction monitoring indicates that applying displacement rates greater than 50% and mortality rates of more than 1% is overly precautionary (e.g. APEM, 2022). Further details of how displacement mortality was estimated are presented in the Displacement Assessment (Appendix 9).

However, this estimate includes non-breeding adults and immature birds, as well as breeding adults. Studies have shown that for several seabird species, in addition to breeding birds, colonies are also attended by many immature individuals and a smaller number of non-breeding adults (e.g. Wanless *et al.,* 1998). There is little information on the breakdown of immature and non-breeding adults present at a colony, however, this has been estimated using proportions from Horswill and Robinson (2015) (Appendix 7). Based on the proportion of adult guillemots from the population age ratio (0.522), 52.2% of the population present were assumed to be adult birds, with a corresponding 47.8% of the population assumed to be immature birds. This means that between eight and 50 guillemots displaced from the OAA and 2 km buffer during the breeding season would be adult birds, with between eight and 46 immature birds also displaced.

However, a proportion of adult birds present at colonies in the breeding season will opt not to breed in a particular breeding season. It has been estimated that 7% of adult guillemots may be “sabbatical” birds in any particular breeding season (Xodus, 2023), and this has been applied for this assessment. On this basis, between one and four displaced adult guillemots were considered not to be breeding, therefore guillemot mortality was considered to be between seven and 46 breeding adults, one to four non-breeding “sabbatical” adults and between eight and 46 immature birds (Table 4-35).

For the non-breeding season in the OAA and 2 km buffer, and a displacement rate of 50% and a mortality rate of 1%, displacement mortality was predicted to be two birds. Based on a displacement rate of 60%, and a mortality rate of 1%, displacement mortality was predicted to be two birds in the non-breeding season, increasing to six birds, if a mortality rate of 3% is applied (Table 4-35). Further details and the seasonal displacement matrices are presented in Appendix 9.

Table 4-35 Estimated breeding season displacement mortality for guillemots from the Loop Head SPA

Season	Estimated mortality	Most recent population (birds)	Apportioned colony percentage	Estimated SPA mortality
50% displacement and 1% mortality rate				
Breeding (Mar-July)	7	10,331	2.5%	0.18 birds
Non-breeding (Aug-Feb)	2	19,795	1.5%	0.03 birds
Annual total	9	-	-	0.21 birds
60% displacement and 5% mortality rate in breeding season; 3% in non-breeding season				
Breeding (Mar-July)	46	10,331	2.5%	0.41 birds

Season	Estimated mortality	Most recent population (birds)	Apportioned colony percentage	Estimated SPA mortality
Non-breeding (Aug-Feb)	6	19,795	1.5%	0.09 birds
Total	52	-	-	0.5 birds

In the breeding season, apportioning estimated that 2.5% of estimated guillemot displacement mortality would involve breeding guillemots from the Loop Head SPA. Based on a 50% displacement rate and a 1% mortality rate, this equates to 0.18 birds from the SPA per breeding season (7x0.025). Based on a 60% displacement rate and a 5% mortality rate, this equates to 1.15 birds from the SPA per breeding season (46x0.025) (Table 4-35).

In the non-breeding season, apportioning estimated that 1.5% of estimated guillemot displacement mortality would involve guillemots from the Loop Head SPA. Based on a 50% displacement rate and a 1% mortality rate, this equates to 0.03 birds from the SPA per non-breeding season (2x0.015). Based on a 60% displacement rate and a 5% mortality rate, this equates to 0.09 birds from the SPA per non-breeding season (6x0.015) (Table 4-35).

Overall, total annual guillemot displacement mortality based on a 50% displacement rate and a 1% mortality rate was predicted to involve 0.21 guillemots from the Loop Head SPA. Based on a 60% displacement rate and a 5% mortality rate in the breeding season and a 3% mortality rate in the non-breeding season, annual guillemot displacement mortality was predicted to involve 0.5 guillemots from the Loop Head SPA (Table 4-35).

The guillemot breeding population at the Loop Head SPA is estimated to be 10,331 adult birds (Appendix 7), however there will also be immature birds reared at this SPA that form a component of the SPA population. Applying an immature to adult ratio of 0.916 (Horswill & Robinson, 2015), the total estimated SPA population (adults plus immatures) is 19,795 birds (Table 4-35). For this assessment the baseline annual mortality was calculated based on an estimated average guillemot baseline mortality rate (all ages) of 0.136 (Horswill & Robinson, 2015). Applying this mortality rate, the estimated annual baseline mortality of guillemots at the Loop Head SPA is 2,692 birds (19,795x 0.136).

Based on a 50% displacement rate and a 1% mortality rate, the additional annual predicted displacement mortality of 0.21 guillemots would increase the baseline mortality rate by 0.01%. Based on a 60% displacement rate and a 5% mortality rate in the breeding season and a 3% mortality rate in the non-breeding season, the additional annual predicted displacement mortality of 0.5 guillemots would increase the baseline mortality rate by 0.02%.

As highlighted by Natural England guidance, where predicted impacts equate to 1% or below of baseline mortality for a population (e.g. colony population) then this level of impact could be considered non-significant (Parker *et al.,* 2022c). As the predicted increases in annual baseline displacement mortality for guillemot were below 1%, PVA was not carried out on the Loop Head SPA guillemot population, as agreed in the East Coast Phase 1 Method Statement (GoBe, 2022).

On this basis, there will be no adverse effect on the guillemot qualifying feature of the Loop Head SPA, as defined by the COs for the site as a result of displacement effects from the Offshore Site.

In relation to the Loop Head SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.14 Bills Rocks SPA (004177)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of the Bills Rocks SPA which are listed in Table 3-11.

This SPA is of high ornithological importance for two species of breeding seabirds (storm petrel and puffin) (NPWS, 2024).

Storm petrel has been screened out from further assessment on the basis that this species was only recorded in very low numbers (annual peak count of less than 10 birds) in each year of the site-specific baseline surveys. These infrequently occurring species were considered using expert judgement to be extremely unlikely to use the OAA in numbers large enough to warrant further consideration.

As per Table 3-4, a source-pathway-receptor chain for adverse effects on one QI species of this SPA (puffin) has been identified, as a result of potential displacement impacts during the Operation and Maintenance phase. These potential impacts are assessed in the following sections.

Puffin

The conservation objectives (COs) for puffin at the Bills Rocks SPA are presented in Table 3-11. Displacement impacts are limited to the Operation and Maintenance phase, as turbines will not be operating in the construction or decommissioning phases. It was considered that there was no other source-pathway-receptor chain for adverse effects for the other phases of development therefore the other phases of development are not considered within this assessment.

The Bills Rocks SPA population of breeding puffins in 1999 was 1,500 Apparently Occupied Burrows (AOB) (NPWS, 2024), which corresponds to 3,000 individuals. The breeding population recorded during the Seabirds Count 2015-2021 national census was 150 AOBs, which corresponds to 300 individuals (Appendix 7).

Based on the mean seasonal peak of puffins in the OAA and 2 km buffer, and a displacement rate of 50% and a mortality rate of 1%, displacement mortality was predicted to be zero birds in the breeding season. Based on a displacement rate of 60%, and a mortality rate of 3%, displacement mortality was predicted to be one puffin in the breeding season, increasing to two puffins, if a mortality rate of 5% was applied (Table 4-36).

For the non-breeding season in the OAA and 2 km buffer, and a displacement rate of 50% and a mortality rate of 1%, displacement mortality was predicted to be zero birds. Based on a displacement rate of 60%, and mortality rates of 1% and 3%, displacement mortality was also predicted to be zero birds (Table 4-36). Further details and the seasonal displacement matrices are presented in the Displacement Assessment Appendix (Appendix 9).

Table 4-36 Estimated breeding season displacement mortality for puffins from the Bills Rocks SPA

Season	Estimated mortality	Most recent population (birds)	Apportioned colony percentage	Estimated SPA mortality
50% displacement and 1% mortality rate				
Breeding (Apr-early Aug)	0	300 birds	4.3%	0 birds

Season	Estimated mortality	Most recent population (birds)	Apportioned colony percentage	Estimated SPA mortality
Non-breeding (mid-Aug-Mar)	0	553 birds	0.2%	0 birds
Annual total	0	-	-	0 birds
60% displacement and 5% mortality rate in breeding season; 3% in non-breeding season				
Breeding (Apr-early Aug)	2	300 birds	4.3%	0.09 birds
Non-breeding (mid-Aug-Mar)	0	553 birds	0.2%	0 birds
Total	2	-	-	0.09 birds

In the breeding season, apportioning estimated that 4.3% of estimated puffin displacement mortality would involve breeding puffins from the Bills Rocks SPA. Based on a 50% displacement rate and a 1% mortality rate, this equates to zero birds from the SPA per breeding season, as zero puffins were predicted to be displaced. Based on a 60% displacement rate and a 5% mortality rate, this equates to 0.09 birds from the SPA per breeding season (2x0.043) (Table 4-36).

In the non-breeding season, apportioning estimated that 0.2% of estimated puffin displacement mortality would involve puffins from the Bills Rocks SPA. Based on a 50% displacement rate and a 1% mortality rate, this equates to zero birds from the SPA, as zero puffins were predicted to be displaced in the non-breeding season. Based on a 60% displacement rate and a 5% mortality rate, this also equates to zero birds from the SPA, as zero puffins were predicted to be displaced in the non-breeding season (Table 4-36).

Overall, total annual puffin displacement mortality based on a 50% displacement rate and a 1% mortality rate was predicted to involve zero puffins from the Bills Rocks SPA. Based on a 60% displacement rate and a 5% mortality rate in the breeding season and a 3% mortality rate in the non-breeding season, annual puffin displacement mortality was predicted to involve 0.09 puffins from the Bills Rocks SPA (Table 4-36).

The puffin breeding population at the Bills Rocks SPA is estimated to be 300 adult birds (Appendix 7), however there will also be immature birds reared at this SPA that form a component of the SPA population. Applying an immature to adult ratio of 0.842 (Horswill & Robinson, 2015), the total estimated SPA population (adults plus immatures) is 553 birds (Table 4-36). For this assessment the baseline annual mortality was calculated based on an estimated average puffin baseline mortality rate (all ages) of 0.177 (Horswill & Robinson, 2015). Applying this mortality rate, the estimated annual baseline mortality of puffins at the Bills Rocks SPA is 98 birds (553x 0.177).

Based on a 50% displacement rate and a 1% mortality rate, the additional annual predicted displacement mortality of zero puffins would increase the baseline mortality rate by 0%. Based on a 60% displacement rate and a 5% mortality rate in the breeding season and a 3% mortality rate in the non-breeding season, the additional annual predicted displacement mortality of 0.09 puffins would increase the baseline mortality rate by 0.09%.

As highlighted by Natural England guidance, where predicted impacts equate to 1% or below of baseline mortality for a population (e.g. colony population) then this level of impact could be considered non-significant (Parker *et al.,* 2022c). As the predicted increases in annual baseline displacement mortality for puffin were below 1%, PVA was not carried out on the Bills Rocks SPA puffin population, as agreed in the East Coast Phase 1 Method Statement (GoBe, 2022).

On this basis, there will be no adverse effect on the puffin qualifying feature of the Bills Rocks SPA, as defined by the COs for the site as a result of displacement effects from the Offshore Site.

In relation to the Bills Rocks SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.15 Dingle Peninsula SPA (004153)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of the Dingle Peninsula SPA which are listed in Table 3-11.

This SPA is of ornithological importance as it supports an internationally important population of chough, as well as nationally important populations of fulmar and peregrine (NPWS, 2024).

Chough and peregrine are terrestrial species and there is no pathway for these species to be at risk of adverse effects from the Offshore Site , so they are not discussed further here.

Fulmars have a mean maximum foraging range of 1,200.2 km (Woodward *et al.,* 2019), therefore there is potential for connectivity for this species between this SPA and the OAA. However, fulmars are not considered to be at risk of displacement or barrier effects (e.g. Dierschke *et al.*, 2016). The species is also considered to have a low sensitivity to collisions with OWFs (e.g. Bradbury *et al.,* 2014), as birds typically fly low to the sea surface. On this basis, there is no adverse effect on this breeding QI species at this SPA.

In relation to the Dingle Peninsula SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.16 Duvillaun Islands SPA (004111)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of the Duvillaun Islands SPA which are listed in Table 3-11.

This SPA is of high ornithological importance as it forms part of the wintering range of an internationally important population of barnacle goose, while also supporting nationally important breeding populations of fulmar and storm petrel (NPWS, 2024).

Storm petrel has been excluded from further assessment on the basis that this species was only recorded in very low numbers (annual peak count of less than 10 birds) in each year of the site-specific baseline surveys (Appendix 7). These infrequently occurring species were considered using expert judgement to be extremely unlikely to use the OAA in numbers large enough to warrant further consideration.

Fulmars have a mean maximum foraging range of 1,200.2 km (Woodward *et al.,* 2019), therefore there is potential for connectivity for this species between this SPA and the OAA. However, fulmars are not considered to be at risk of displacement or barrier effects (e.g. Dierschke *et al.*, 2016). The species is also considered to have a low sensitivity to collisions with OWFs (e.g. Bradbury *et al.,* 2014), as birds typically fly low to the sea surface. On this basis, there is no adverse effect on this breeding QI species at this SPA.

Barnacle goose was screened in in Table 3-1 as being at potential risk of collision if individuals pass through the OAA on spring and autumn migration or during the winter months, when they may be present within this SPA. However, the results from the mCRM concluded that there was no connecting migratory pathway for this species between the SPA and the OAA, therefore the potential collision risk for this species would be negligible (Appendix 10). On this basis, there is no adverse effect on this non-breeding season QI species at this SPA.

In relation to the Duvillaun Islands SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.17 Inishglora and Inishkeeragh SPA (004084)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of the Inishglora and Inishkeeragh SPA which are listed in Table 3-11.

This SPA is one of the most important seabird sites in the region, with nationally important populations of storm petrel, cormorant, shag, lesser black-backed gull, herring gull and Arctic tern. In addition, this SPA also supports nationally important numbers of wintering barnacle geese (NPWS, 2024).

Storm petrel has been screened out from further assessment on the basis that this species was only recorded in very low numbers (annual peak count of less than 10 birds) in each year of the site-specific baseline surveys. These infrequently occurring species were considered using expert judgement to be extremely unlikely to use the OAA in numbers large enough to warrant further consideration.

The Offshore Site is outside mean maximum foraging range of breeding cormorants, shags, herring gulls and Arctic terns from this SPA (Woodward *et al.,* 2019), therefore there is no risk that breeding adults of these species from this SPA will be present in the OAA during the breeding season. It is considered unlikely that individual Arctic terns from this SPA would pass through the OAA on migration, due to the distance between this SPA and the OAA (117 km at the nearest point). On this basis, there is no adverse effect on these breeding species at this SPA.

Barnacle goose was screened in in Table 3-1 as being at potential risk of collision if individuals pass through the OAA on spring and autumn migration or during the winter months, when they may be present within this SPA. However, the results from the mCRM concluded that there was no connecting migratory pathway for this species between the SPA and the OAA, therefore the potential collision risk for this species would be negligible (Appendix 10). On this basis, there is no adverse effect on this non-breeding season QI species at this SPA.

As per Table 3-4, a source-pathway-receptor chain for adverse effects on one QI species of this SPA (lesser black-backed gull) has been identified, as a result of potential collision impacts during the Operation and Maintenance phase. These potential impacts are assessed in the following sections.

4.2.4.17.1 *Collision Risk*

Lesser black-backed gull

The conservation objectives (COs) for lesser black-backed gull at the Inishglora and Inishkeeragh SPA are presented in Table 3-11. Collision impacts are limited to the Operation and Maintenance phase, as turbines will not be operating in the construction or decommissioning phases. It was considered that there was no other source-pathway-receptor chain for adverse effects for the other phases of development therefore the other phases of development are not considered within this assessment.

The Inishglora and Inishkeeragh SPA population of breeding lesser black-backed gulls in 2001 was 66 pairs (NPWS, 2024), which equates to 132 breeding adults. The breeding population recorded during the Seabirds Count 2015-2021 national census was 59 AON (118 breeding adults) (Burnell *et al.,* 2023).

In the breeding season (April to August) the CRM assessment predicted that the mean number of lesser black-backed gull collisions per breeding season would involve 2.8 birds (Appendix 6). However, this includes non-breeding adults and immature birds, as well as breeding adults. As all aged lesser black-backed gulls recorded on baseline surveys in the breeding season were adults, (Appendix 7), it was assumed that 100% of the population present are adult birds, therefore breeding season lesser black-backed gull collision mortality was considered to involve 2.8 adult birds.

A proportion of adult birds present at colonies in the breeding season will opt not to breed in a particular breeding season. It has been estimated that 35% of adult lesser black-backed gulls may be "sabbatical" birds in any particular breeding season (RPS, 2022), and this has been applied for this assessment. On this basis, 0.97 adult lesser black-backed gulls predicted to collide were considered not to be breeding, therefore lesser black-backed gull collision mortality in the breeding season was considered to be 1.83 adult breeding birds.

In the autumn migration period and winter period of the non-breeding season, zero lesser black-backed collisions were predicted. In the spring migration period of the non-breeding season, the CRM assessment predicted that the mean number of lesser black-backed gull collisions per breeding season would involve 0.4 birds (Appendix 6) (Table 4-37).

Table 4-37 Estimated breeding season collision mortality for lesser black-backed gull from the Inishglora and Inishkeeragh SPA

Season	Estimated mortality	Most recent population (birds)	Apportioned colony percentage	Estimated SPA mortality
Breeding (Mar-Aug)	1.83 breeding adults	118 birds	0.2%	0.004 birds
Autumn migration (Sep-Oct)	0 birds	221 birds	0.2%	0 birds
Winter period (Nov-Feb)	0 birds	221 birds	0.6%	0 birds
Spring migration (Mar)	0.4 birds	221 birds	0.2%	0.001 birds
Total	2.23 birds	-	-	0.005 birds

In the breeding season, apportioning estimated that 0.2% of estimated lesser black-backed gull collision mortality (1.83 breeding adults) would involve breeding lesser black-backed gulls from the Inishglora and Inishkeeragh SPA. This equates to 0.004 birds from the SPA per breeding season (1.83x0.002) (Table 4-37).

In the autumn migration period of the non-breeding season, apportioning estimated that 0.2% of estimated lesser black-backed gull collision mortality (zero birds) would involve lesser black-backed gulls from the Inishglora and Inishkeeragh SPA. Therefore, estimated SPA mortality was zero birds in the autumn migration period, as no birds were predicted to collide in the autumn migration period (Table 4-37).

In the winter period of the non-breeding season, apportioning estimated that 0.6% of estimated lesser black-backed gull collision mortality (zero birds) would involve lesser black-backed gulls from the Inishglora and Inishkeeragh SPA. Therefore, estimated SPA mortality was zero birds in winter period, as no birds were predicted to collide in the winter period (Table 4-37).

In the spring migration period of the non-breeding season, apportioning estimated that 0.2% of estimated lesser black-backed gull collision mortality (0.4 birds) would involve lesser black-backed gulls from the Inishglora and Inishkeeragh SPA. This equates to 0.001 birds from the SPA per breeding season (0.4x0.002) (Table 4-37).

Overall, total annual lesser black-backed gull collision mortality (2.23 birds) was predicted to involve 0.005 lesser black-backed gulls from the Inishglora and Inishkeeragh SPA (Table 4-37).

The lesser black-backed gull breeding population at the Inishglora and Inishkeeragh SPA is estimated to be 118 adult birds (Burnell *et al.,* 2023), however there will also be immature birds reared at this SPA that form a component of the SPA population. Applying an immature to adult ratio of 0.876 (Horswill & Robinson, 2015), the total estimated SPA population (adults plus immatures) is 221 birds (Table 4-37). For this assessment the baseline annual mortality was calculated based on an estimated average lesser black-backed gull baseline mortality rate (all ages) of 0.123 (Horswill & Robinson, 2015). Applying this mortality rate, the estimated annual baseline mortality of lesser black-backed gulls at the Inishglora and Inishkeeragh SPA is 27 birds (221 x 0.123). The additional annual predicted mortality of 0.005 lesser black-backed gulls would increase the baseline mortality rate by 0.02%.

As highlighted by Natural England guidance, where predicted impacts equate to 1% or below of baseline mortality for a population (e.g. colony population) then this level of impact could be considered non-significant (Parker *et al.,* 2022c). As the predicted increase in annual baseline mortality for lesser black-backed gull was below 1%, PVA was not carried out on the Inishglora and Inishkeeragh SPA lesser black-backed gull population, as agreed in the East Coast Phase 1 Method Statement (GoBe, 2022).

On this basis, there will be no adverse effect on the lesser black-backed gull qualifying feature of the Inishglora and Inishkeeragh SPA, as defined by the COs for the site as a result of collision effects from the Offshore Site.

In relation to the Inishglora and Inishkeeragh SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.18 Blasket Islands SPA (004008)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of the Blasket Islands SPA which are listed in Table 3-11.

This SPA is one of the most important seabird sites in the country, with internationally important breeding populations of storm petrel and Manx shearwater and nationally important populations of fulmar, shag, lesser black-backed gull, herring gull, kittiwake, Arctic tern, razorbill and puffin. Choughs also breed within the SPA (NPWS, 2024).

Storm petrel has been screened out from further assessment on the basis that this species was only recorded in very low numbers (annual peak count of less than 10 birds) in each year of the site-specific baseline surveys. These infrequently occurring species were considered using expert judgement to be extremely unlikely to use the OAA in numbers large enough to warrant further consideration.

Chough is a terrestrial species and there is no pathway for this species to be at risk of adverse effects from the Offshore Site , so it is not discussed further here.

Manx shearwaters have a very large mean maximum foraging range (2,365.5 km) (Woodward *et al.,* 2019) therefore they are not considered to be at risk of displacement or barrier effects (e.g. Bradbury *et al.,* 2014). This species is also not considered to be at risk of collision impacts (e.g. Bradbury *et al.,* 2014) as birds typically fly low to the sea surface. On this basis, there is no adverse effect on this breeding QI species at this SPA.

Similarly, fulmars have a very large mean maximum foraging range of 1,200.2 km (Woodward *et al.,* 2019), therefore fulmars are not considered to be at risk of displacement or barrier effects (e.g. Dierschke *et al*., 2016). Fulmars are also considered to have a low sensitivity to collisions with OWFs (e.g. Bradbury *et al.,* 2014), as birds typically fly low to the sea surface. On this basis, there is no adverse effect on this breeding QI species at this SPA.

The Offshore Site is outside mean maximum foraging range of breeding shags, herring gulls and Arctic terns from this SPA (Woodward *et al.,* 2019), there is no risk that breeding adults from this species from this SPA will be present in the OAA during the breeding season. It is considered unlikely that individual Arctic terns from this SPA would pass through the OAA on migration, due to the distance between this SPA and the OAA (139 km at the nearest point). On this basis, there is no adverse effect on these breeding species from this SPA.

As per Table 3-4, a source-pathway-receptor chain for adverse effects on four QI species of this SPA (lesser black-backed gull, kittiwake, razorbill and puffin) have been identified, as a result of potential collision and displacement impacts during the Operation and Maintenance phase. These potential impacts are assessed in the following sections.

4.2.4.18.1 Collision Risk

Lesser black-backed gull

The conservation objectives (COs) for lesser black-backed gull at the Blasket Islands SPA are presented in Table 3-11. Collision impacts are limited to the Operation and Maintenance phase, as turbines will not be operating in the construction or decommissioning phases. It was considered that there was no other source-pathway-receptor chain for adverse effects for the other phases of development therefore the other phases of development are not considered within this assessment.

The Blasket Islands SPA population of breeding lesser black-backed gulls in 1988 was 333 pairs (NPWS, 2024), which equates to 666 breeding adults. The breeding population recorded during the Seabirds Count 2015-2021 national census was 83 AON (166 breeding adults) (Appendix 7).

In the breeding season (April to August) the CRM assessment predicted that the mean number of lesser black-backed gull collisions per breeding season would involve 2.8 birds (Appendix 6). However, this includes non-breeding adults and immature birds, as well as breeding adults. As all aged lesser black-backed gulls recorded on baseline surveys in the breeding season were adults, (Appendix 7), it was assumed that 100% of the population present are adult birds, therefore breeding season lesser black-backed gull collision mortality was considered to involve 2.8 adult birds.

A proportion of adult birds present at colonies in the breeding season will opt not to breed in a particular breeding season. It has been estimated that 35% of adult lesser black-backed gulls may be “sabbatical” birds in any particular breeding season (RPS, 2022), and this has been applied for this assessment. On this basis, 0.97 adult lesser black-backed gulls predicted to collide were considered not to be breeding, therefore lesser black-backed gull collision mortality in the breeding season was considered to be 1.83 adult breeding birds.

In the autumn migration period and winter period of the non-breeding season, zero lesser black-backed collisions were predicted. In the spring migration period of the non-breeding season, the CRM assessment predicted that the mean number of lesser black-backed gull collisions per breeding season would involve 0.4 birds (Appendix 6) (Table 4-38).

Table 4-38 Estimated breeding season collision mortality for lesser black-backed gull from the Inishglora and Inishkeeragh SPA

Season	Estimated mortality	Most recent population (birds)	Apportioned colony percentage	Estimated SPA mortality
Breeding (Mar-Aug)	1.83 breeding adults	166 birds	0.1%	0.002 birds
Autumn migration (Sep-Oct)	0 birds	312 birds	0.2%	0 birds
Winter period (Nov-Feb)	0 birds	312 birds	0.6%	0 birds
Spring migration (Mar)	0.4 birds	312 birds	0.2%	0.001 birds
Total	2.23 birds	-	-	0.003 birds

In the breeding season, apportioning estimated that 0.1% of estimated lesser black-backed gull collision mortality (1.83 breeding adults) would involve breeding lesser black-backed gulls from the Blasket Islands SPA. This equates to 0.002 birds from the SPA per breeding season (1.83x0.001) (Table 4-38).

In the autumn migration period of the non-breeding season, apportioning estimated that 0.2% of estimated lesser black-backed gull collision mortality (zero birds) would involve lesser black-backed gulls from the Blasket Islands SPA. Therefore, estimated SPA mortality was zero birds in the autumn migration period, as no birds were predicted to collide in the autumn migration period (Table 4-38).

In the winter period of the non-breeding season, apportioning estimated that 0.6% of estimated lesser black-backed gull collision mortality (zero birds) would involve lesser black-backed gulls from the Blasket Islands SPA. Therefore, estimated SPA mortality was zero birds in winter period, as no birds were predicted to collide in the winter period (Table 4-38).

In the spring migration period of the non-breeding season, apportioning estimated that 0.2% of estimated lesser black-backed gull collision mortality (0.4 birds) would involve lesser black-backed gulls from the Blasket Islands SPA. This equates to 0.001 birds from the SPA per breeding season (0.4x0.002) (Table 4-36).

Overall, total annual lesser black-backed gull collision mortality (2.23 birds) was predicted to involve 0.003 lesser black-backed gulls from the Blasket Islands SPA (Table 4-38).

The lesser black-backed gull breeding population at the Blasket Islands SPA is estimated to be 166 adult birds (Appendix 7), however there will also be immature birds reared at this SPA that form a component of the SPA population. Applying an immature to adult ratio of 0.876 (Horswill & Robinson, 2015), the total estimated SPA population (adults plus immatures) is 312 birds (Table 4-38). For this assessment the baseline annual mortality was calculated based on an estimated average lesser black-backed gull baseline mortality rate (all ages) of 0.123 (Horswill & Robinson, 2015). Applying this mortality rate, the estimated annual baseline mortality of lesser black-backed gulls at the Blasket Islands

SPA is 38 birds (312 x 0.123). The additional annual predicted mortality of 0.003 lesser black-backed gulls would increase the baseline mortality rate by 0.01%.

As highlighted by Natural England guidance, where predicted impacts equate to 1% or below of baseline mortality for a population (e.g. colony population) then this level of impact could be considered non-significant (Parker *et al.,* 2022c). As the predicted increase in annual baseline mortality for lesser black-backed gull was below 1%, PVA was not carried out on the Blasket Islands SPA lesser black-backed gull population, as agreed in the East Coast Phase 1 Method Statement (GoBe, 2022).

On this basis, there will be no adverse effect on the lesser black-backed gull qualifying feature of the Blasket Islands SPA, as defined by the COs for the site as a result of collision effects from the Offshore Site.

Kittiwake

The conservation objectives (COs) for kittiwake at the Blasket Islands SPA are presented in Table 3-11. Collision impacts are limited to the Operation and Maintenance phase, as turbines will not be operating in the construction or decommissioning phases. It was considered that there was no other source-pathway-receptor chain for adverse effects for the other phases of development therefore the other phases of development are not considered within this assessment.

The Blasket Islands SPA population of breeding kittiwakes in 1988 was 733 pairs (NPWS, 2024), which equates to 1,546 breeding adults. The breeding population recorded during the Seabirds Count 2015-2021 national census was 832 AON (1,664 breeding adults) (Appendix 7).

In the breeding season (March to August) the CRM assessment predicted that the mean number of kittiwake collisions per breeding season would involve 4.4 birds (Appendix 6). However, this includes non-breeding adults and immature birds, as well as breeding adults. Based on the proportion of immature kittiwakes recorded on baseline surveys in the breeding season (Appendix 7), it was assumed that 91.95% of the population present are adult birds. This would mean that an estimated 4.0 kittiwakes predicted to collide during the breeding season would be adult birds.

Similarly, a proportion of adult birds present at colonies in the breeding season will opt not to breed in a particular breeding season. It has been estimated that 10% of adult kittiwakes may be "sabbatical" birds in any particular breeding season (Xodus, 2023), and this has been applied for this assessment. On this basis, 0.4 adult kittiwakes predicted to collide was considered not to be breeding. Therefore, adult kittiwake mortality in the breeding season was considered to involve 3.6 adult breeding birds and 0.4 non-breeding adults (Table 4-39).

In the autumn migration period of the non-breeding season, the CRM assessment predicted that the mean number of kittiwake collisions would involve 2.8 birds. In the spring migration period of the non-breeding season, the CRM assessment predicted that the mean number of kittiwake collisions would involve 1.0 birds (Table 4-39).

Table 4-39 Estimated breeding season collision mortality for kittiwakes from the Blasket Islands SPA

Season	Estimated mortality	Most recent population (birds)	Apportioned colony percentage	Estimated SPA mortality
Breeding (Mar-Aug)	3.6 breeding adults	1,664 birds	1.2%	0.04 birds
Autumn migration	2.8 birds	3,159 birds	0.3%	0.01 birds

Season	Estimated mortality	Most recent population (birds)	Apportioned colony percentage	Estimated SPA mortality
Spring migration	1.0 birds	3,159 birds	0.4%	0.004 birds
Total	8.2	-	-	0.054 birds

In the breeding season, apportioning estimated that 1.2% of estimated kittiwake collision mortality (3.6 breeding adults) would involve breeding kittiwakes from the Blasket Islands SPA. This equates to 0.04 birds from the SPA per breeding season (3.6x0.012) (Table 4-39).

In the autumn migration period of the non-breeding season, apportioning estimated that 0.3% of estimated kittiwake collision mortality (2.8 birds) would involve kittiwakes from the Blasket Islands SPA. Therefore, estimated SPA mortality was 0.01 birds in the autumn migration period (2.8x0.003) (Table 4-39).

In the spring migration period of the non-breeding season, apportioning estimated that 0.4% of estimated kittiwake collision mortality (1.0 birds) would involve kittiwakes from the Blasket Islands SPA. This equates to 0.004 birds from the SPA per breeding season (1.0x0.004) (Table 4-39).

Overall, total annual kittiwake collision mortality (8.2 birds) was predicted to involve 0.054 kittiwakes from the Blasket Islands SPA (Table 4-39).

The kittiwake breeding population at the Blasket Islands SPA is estimated to be 1,664 adult birds (Appendix 7), however there will also be immature birds reared at this SPA that form a component of the SPA population. Applying an immature to adult ratio of 0.898 (Horswill & Robinson, 2015), the total estimated SPA population (adults plus immatures) is 3,159 birds (Table 4-39). For this assessment the baseline annual mortality was calculated based on an estimated average kittiwake baseline mortality rate (all ages) of 0.156 (Horswill & Robinson, 2015). Applying this mortality rate, the estimated annual baseline mortality of kittiwakes at the Blasket Islands SPA is 493 birds (3,159 x 0.156). The additional annual predicted mortality of 0.054 kittiwakes would increase the baseline mortality rate by 0.01%.

As highlighted by Natural England guidance, where predicted impacts equate to 1% or below of baseline mortality for a population (e.g. colony population) then this level of impact could be considered non-significant (Parker *et al.,* 2022c). As the predicted increase in annual baseline mortality for kittiwake was below 1%, PVA was not carried out on the Blasket Islands SPA kittiwake population, as agreed in the East Coast Phase 1 Method Statement (GoBe, 2022).

On this basis, there will be no adverse effect on the kittiwake qualifying feature of the Blasket Islands SPA, as defined by the COs for the site as a result of collision effects from the Offshore Site.

4.2.4.18.2 Displacement

Kittiwake

The conservation objectives (COs) for kittiwake at the Blasket Islands SPA are presented in Table 3-11. Displacement impacts are limited to the Operation and Maintenance phase, as turbines will not be operating in the construction or decommissioning phases. It was considered that there was no other source-pathway-receptor chain for adverse effects for the other phases of development therefore the other phases of development are not considered within this assessment.

The Blasket Islands SPA population of breeding kittiwakes in 1988 was 733 pairs (NPWS, 2024), which equates to 1,546 breeding adults. The breeding population recorded during the Seabirds Count 2015-2021 national census was 832 AON (1,664 breeding adults) (Appendix 7).

Recent guidance for OWF projects in Scottish waters recommended that a displacement rate of 30% should be used for kittiwakes (NatureScot, 2023), and this displacement rate has been applied for this assessment. NatureScot guidance also recommended that mortality rates of 1% and 3% throughout the year should be used for kittiwake in displacement assessments (NatureScot, 2023). These mortality rates have also been applied for this assessment. Further details of the displacement assessment approach and the seasonal displacement matrices are presented in the Displacement Assessment Appendix (Appendix 9).

Due to the low numbers of birds involved, for the purposes of this assessment, it has been assumed that all predicted mortality involved adult breeding kittiwakes, which is considered to be precautionary, as both adult and immature kittiwakes were recorded in the Offshore Ornithology Study Area on baseline surveys throughout the year (Appendix 7).

In the breeding season, the mean seasonal peak of kittiwakes in the OAA plus 2 km buffer was 93 birds. Based on a displacement rate of 30%, this would mean that an estimated 28 kittiwakes would be displaced from the OAA and 2 km buffer in the breeding season. Applying a 1% mortality rate would therefore involve 0.28 kittiwakes. Applying a 3% mortality rate would involve 0.84 kittiwakes (Table 4-40).

In the autumn migration period of the non-breeding season, the mean seasonal peak of kittiwakes in the OAA plus 2 km buffer was 79 birds. Based on a displacement rate of 30%, this would mean that an estimated 24 kittiwakes would be displaced from the OAA and 2 km buffer in the autumn migration period. Applying a 1% mortality rate would therefore involve 0.24 kittiwakes. Applying a 3% mortality rate would involve 0.72 kittiwakes (Table 4-40).

In the spring migration period of the non-breeding season, the mean seasonal peak of kittiwakes in the OAA plus 2 km buffer was 144 birds. Based on a displacement rate of 30%, this would mean that an estimated 43 kittiwakes would be displaced from the OAA and 2 km buffer in the spring migration period. Applying a 1% mortality rate would therefore involve 0.43 kittiwakes. Applying a 3% mortality rate would involve 1.29 kittiwakes (Table 4-40).

Further details and the seasonal displacement matrices are presented in the Displacement Assessment Appendix (Appendix 9).

Table 4-40 Estimated breeding season displacement mortality for kittiwakes from the Blasket Islands SPA

Season	Estimated mortality	Most recent population (birds)	Apportioned colony percentage	Estimated SPA mortality
30% displacement and 1% mortality rate				
Breeding (Mar-Aug)	0.28 birds	1,664 birds	1.2%	0.003 birds
Autumn migration (Sep-Dec)	0.24 birds	3,159 birds	0.3%	0.001 birds
Spring migration (Jan-Feb)	0.43 birds	3,159 birds	0.4%	0.002 birds

Season	Estimated mortality	Most recent population (birds)	Apportioned colony percentage	Estimated SPA mortality
Annual total	0.95 birds	-	-	0.006 birds
30% displacement and 3% mortality rate				
Breeding (Mar-Aug)	0.84 birds	1,664 birds	1.2%	0.01 birds
Autumn migration (Sep-Dec)	0.72 birds	3,159 birds	0.3%	0.002 birds
Spring migration (Jan-Feb)	1.29 birds	3,159 birds	0.4%	0.005 birds
Total	2.85 birds	-	-	0.02 birds

In the breeding season, apportioning estimated that 1.2% of estimated kittiwake displacement mortality would involve breeding kittiwakes from the Blasket Islands SPA. Based on a 30% displacement rate and a 1% mortality rate, this equates to 0.003 birds from the SPA per breeding season (0.28x0.012). Based on a 30% displacement rate and a 3% mortality rate, this equates to 0.01 birds from the SPA per breeding season (0.84x0.012) (Table 4-40).

In the autumn migration period of the non-breeding season, apportioning estimated that 0.3% of estimated kittiwake displacement mortality would involve kittiwakes from the Blasket Islands SPA. Based on a 30% displacement rate and a 1% mortality rate, this equates to 0.001 birds from the SPA per breeding season (0.24x0.003). Based on a 30% displacement rate and a 3% mortality rate, this equates to 0.002 birds from the SPA per breeding season (0.72x0.003) (Table 4-40).

In the spring migration period of the non-breeding season, apportioning estimated that 0.4% of estimated kittiwake displacement mortality would involve kittiwakes from the Blasket Islands SPA. Based on a 30% displacement rate and a 1% mortality rate, this equates to 0.002 birds from the SPA per breeding season (0.43x0.004). Based on a 30% displacement rate and a 3% mortality rate, this equates to 0.005 birds from the SPA per breeding season (1.29x0.004) (Table 4-40).

Overall, total annual kittiwake displacement mortality based on a 30% displacement rate and a 1% mortality rate was predicted to involve 0.006 kittiwakes from the Blasket Islands SPA. Based on a 30% displacement rate and a 3% mortality rate, annual kittiwake displacement mortality was predicted to involve 0.02 kittiwakes from the Blasket Islands SPA (Table 4-40).

The kittiwake breeding population at the Blasket Islands SPA is estimated to be 1,664 adult birds (Appendix 7), however there will also be immature birds reared at this SPA that form a component of the SPA population. Applying an immature to adult ratio of 0.898 (Horswill & Robinson, 2015), the total estimated SPA population (adults plus immatures) is 3,159 birds (Table 4-40). For this assessment the baseline annual mortality was calculated based on an estimated average kittiwake baseline mortality rate (all ages) of 0.156 (Horswill & Robinson, 2015). Applying this mortality rate, the estimated annual baseline mortality of kittiwakes at the Blasket Islands SPA is 493 birds (3,159 x 0.156).

Based on a 30% displacement rate and a 1% mortality rate, the additional annual predicted mortality of 0.006 kittiwakes would increase the baseline mortality rate by 0.001%. Based on a 30% displacement rate and a 3% mortality rate, the additional annual predicted mortality of 0.02 kittiwakes would increase the baseline mortality rate by 0.004%.

As highlighted by Natural England guidance, where predicted impacts equate to 1% or below of baseline mortality for a population (e.g. colony population) then this level of impact could be considered non-significant (Parker *et al.,* 2022c). As the predicted increases in annual baseline displacement mortality for kittiwake were below 1%, PVA was not carried out on the Blasket Islands SPA kittiwake population, as agreed in the East Coast Phase 1 Method Statement (GoBe, 2022).

On this basis, there will be no adverse effect on the kittiwake qualifying feature of the Blasket Islands SPA, as defined by the COs for the site as a result of displacement effects from the Offshore Site.

Razorbill

The conservation objectives (COs) for razorbill at the Blasket Islands SPA are presented in Table 3-11. Displacement impacts are limited to the Operation and Maintenance phase, as turbines will not be operating in the construction or decommissioning phases. It was considered that there was no other source-pathway-receptor chain for adverse effects for the other phases of development therefore the other phases of development are not considered within this assessment.

The breeding population recorded at the Blasket Islands SPA during the Seabirds Count 2015-2021 national census was 1,008 individuals (Appendix 7).

Based on the mean seasonal peak of razorbills in the OAA and 2 km buffer, and a displacement rate of 50% and a mortality rate of 1%, displacement mortality was predicted to be one bird in the breeding season. Based on a displacement rate of 60%, and a mortality rate of 3%, displacement mortality was predicted to be four birds in the breeding season, increasing to seven birds, if a mortality rate of 5% was applied. It should be noted that evidence from post-construction monitoring indicates that applying displacement rates greater than 50% and mortality rates of more than 1% is overly precautionary (e.g. APEM, 2022). Further details of how displacement mortality was estimated are presented in the Displacement Assessment (Appendix 9).

However, this estimate includes non-breeding adults and immature birds, as well as breeding adults. Studies have shown that for several seabird species, in addition to breeding birds, colonies are also attended by many immature individuals and a smaller number of non-breeding adults (e.g. Wanless *et al.,* 1998). There is little information on the breakdown of immature and non-breeding adults present at a colony, however, this has been estimated using proportions from Horswill and Robinson (2015) (Appendix 7). Based on the proportion of adult razorbills from the population age ratio, 53.3% of the population present are adult birds, with a corresponding 46.7% of the population being immature birds. This means that between one and four razorbills displaced from the OAA and 2 km buffer during the breeding season would be adult birds, with between zero and three immature birds also displaced.

However, a proportion of adult birds present at colonies in the breeding season will opt not to breed in a particular breeding season. It has been estimated that 7% of adult razorbills may be "sabbatical" birds in any particular breeding season (Xodus, 2023), and this has been applied for this assessment. However, applying this to the small number of adult razorbills predicted to suffer mortality from displacement does not change the predicted number of breeding birds, therefore razorbill mortality was considered to involve between one and four breeding adults, zero non-breeding "sabbatical" adults and zero to three immature birds (Table 4-41).

For the autumn migration period, razorbill displacement mortality was predicted to be zero birds for both 50% and 60% displacement rates and 1% and 3% mortality rates (Table 4-41).

For the winter period, based on a displacement rate of 50% and a mortality rate of 1%, displacement mortality was predicted to be one bird. Based on a displacement rate of 60%, and a mortality rate of 1%, displacement mortality was also predicted to be one bird, increasing to three birds, if a mortality rate of 3% was applied (Table 4-41).

Table 4-41 Estimated breeding season displacement mortality for razorbills from the Blasket Islands SPA

Season	Estimated mortality	Most recent population (birds)	Apportioned colony percentage	Estimated SPA mortality
50% displacement and 1% mortality rate				
Breeding (Apr-July)	1	1,008 birds	0.5%	0.005 birds
Autumn migration (Aug-Oct)	0	1,892 birds	0.3%	0 birds
Winter period (Nov-Dec)	1	1,892 birds	0.5%	0.005 birds
Spring migration (Jan-Mar)	0	1,892 birds	0.3%	0 birds
Annual total	2	-	-	0.01 birds
60% displacement and 5% mortality rate in breeding season; 3% in non-breeding season				
Breeding (Mar-July)	4	1,008 birds	0.5%	0.02 birds
Autumn migration (Aug-Oct)	0	1,892 birds	0.3%	0 birds
Winter period (Nov-Dec)	3	1,892 birds	0.5%	0.015 birds
Spring migration (Jan-Mar)	1	1,892 birds	0.3%	0.003
Total	8	-	-	0.04 birds

For the spring migration period, based on a displacement rate of 50% and a mortality rate of 1%, displacement mortality was predicted to be zero birds. Based on a displacement rate of 60%, and a mortality rate of 1%, displacement mortality was also predicted to be zero birds, increasing to one bird, if a mortality rate of 3% was applied (Table 4-41). Further details and the seasonal displacement matrices are presented in the Displacement Assessment Appendix (Appendix 9).

In the breeding season, apportioning estimated that 0.5% of estimated razorbill displacement mortality would involve breeding razorbills from the Blasket Islands SPA. Based on a 50% displacement rate and a 1% mortality rate, this equates to 0.005 birds from the SPA per breeding season (1x0.005). Based on a 60% displacement rate and a 5% mortality rate, this equates to 0.02 birds from the SPA per breeding season (4x0.005) (Table 4-41).

In the autumn migration period of the non-breeding season, apportioning estimated that 0.3% of estimated razorbill displacement mortality would involve razorbills from the Blasket Islands SPA. Based on a 50% displacement rate and a 1% mortality rate, this equates to zero birds from the SPA, as zero razorbills were predicted to be displaced in the autumn migration period. Based on a 60% displacement rate and a 5% mortality rate, this also equates to zero birds from the SPA, as zero razorbills were predicted to be displaced in the autumn migration period (Table 4-41).

In the winter period of the non-breeding season, apportioning estimated that 0.5% of estimated razorbill displacement mortality would involve razorbills from the Blasket Islands SPA. Based on a 50% displacement rate and a 1% mortality rate, this equates to 0.005 birds from the SPA per non-breeding season (1x0.005). Based on a 60% displacement rate and a 5% mortality rate, this equates to 0.015 birds from the SPA per non-breeding season (3x0.005) (Table 4-41).

In the spring period of the non-breeding season, apportioning estimated that 0.3% of estimated razorbill displacement mortality would involve razorbills from the Blasket Islands SPA. Based on a 50% displacement rate and a 1% mortality rate, this equates to zero birds from the SPA, as zero razorbills were predicted to be displaced in the spring migration period. Based on a 60% displacement rate and a 5% mortality rate, this equates to 0.003 birds from the SPA per non-breeding season (1x0.003) (Table 4-41).

Overall, total annual razorbill displacement mortality based on a 50% displacement rate and a 1% mortality rate was predicted to involve 0.01 razorbills from the Blasket Islands. Based on a 60% displacement rate and a 5% mortality rate in the breeding season and a 3% mortality rate in the non-breeding season, annual razorbill displacement mortality was predicted to involve 0.04 razorbills from the Blasket Islands SPA (Table 4-41).

The razorbill breeding population at Blasket Islands SPA is estimated to be 1,008 adult birds (Appendix 7), however there will also be immature birds reared at this SPA that form a component of the SPA population. Applying an immature to adult ratio of 0.876 (Horswill & Robinson, 2015), the total estimated SPA population (adults plus immatures) is 1,892 birds (Table 4-41). For this assessment the baseline annual mortality was calculated based on an estimated average razorbill baseline mortality rate (all ages) of 0.129 (Horswill & Robinson, 2015). Applying this mortality rate, the estimated annual baseline mortality of razorbills at the Blasket Islands SPA is 244 birds (1,892 x 0.129).

Based on a 50% displacement rate and a 1% mortality rate, the additional annual predicted displacement mortality of 0.01 razorbills would increase the baseline mortality rate by 0.004%. Based on a 60% displacement rate and a 5% mortality rate in the breeding season and a 3% mortality rate in the non-breeding season, the additional annual predicted displacement mortality of 0.04 razorbills would increase the baseline mortality rate by 0.02%.

As highlighted by Natural England guidance, where predicted impacts equate to 1% or below of baseline mortality for a population (e.g. colony population) then this level of impact could be considered non-significant (Parker *et al.,* 2022c). As the predicted increases in annual baseline displacement mortality for razorbill were below 1%, PVA was not carried out on the Blasket Islands SPA razorbill population, as agreed in the East Coast Phase 1 Method Statement (GoBe, 2022).

On this basis, there will be no adverse effect on the razorbill qualifying feature of the Blasket Islands SPA, as defined by the COs for the site as a result of displacement effects from the Offshore Site.

Puffin

The conservation objectives (COs) for puffin at the Blasket Islands SPA are presented in Table 3-11. Displacement impacts are limited to the Operation and Maintenance phase, as turbines will not be operating in the construction or decommissioning phases. It was considered that there was no other source-pathway-receptor chain for adverse effects for the other phases of development therefore the other phases of development are not considered within this assessment.

The Blasket Islands SPA population of breeding puffins in 1988 was 4,924 Apparently Occupied Burrows (AOB) (NPWS, 2024), which corresponds to 9,848 individuals. The breeding population recorded during the Seabirds Count 2015-2021 national census was 2,413 AOBs, which corresponds to 4,826 individuals (Appendix 7).

Based on the mean seasonal peak of puffins in the OAA and 2 km buffer, and a displacement rate of 50% and a mortality rate of 1%, displacement mortality was predicted to be zero birds in the breeding season. Based on a displacement rate of 60%, and a mortality rate of 3%, displacement mortality was predicted to be one puffin in the breeding season, increasing to two puffins, if a mortality rate of 5% was applied (Table 4-42).

For the non-breeding season in the OAA and 2 km buffer, and a displacement rate of 50% and a mortality rate of 1%, displacement mortality was predicted to be zero birds. Based on a displacement rate of 60%, and mortality rates of 1% and 3%, displacement mortality was also predicted to be zero birds (Table 4-42). Further details and the seasonal displacement matrices are presented in the Displacement Assessment Appendix (Appendix 9).

Table 4-42 Estimated breeding season displacement mortality for puffins from the Blasket Islands SPA

Season	Estimated mortality	Most recent population (birds)	Apportioned colony percentage	Estimated SPA mortality
50% displacement and 1% mortality rate				
Breeding (Apr-early Aug)	0	4,826 birds	17.6%	0 birds
Non-breeding (mid-Aug-Mar)	0	8,890 birds	2.4%	0 birds
Annual total	0	-	-	0 birds
60% displacement and 5% mortality rate in breeding season; 3% in non-breeding season				
Breeding (Apr-early Aug)	2	4,826 birds	17.6%	0.35 birds
Non-breeding (mid-Aug-Mar)	0	8,890 birds	2.4%	0 birds
Total	2	-	-	0.35 birds

In the breeding season, apportioning estimated that 17.6% of estimated puffin displacement mortality would involve breeding puffins from the Blasket Islands SPA. Based on a 50% displacement rate and a 1% mortality rate, this equates to zero birds from the SPA per breeding season, as zero puffins were predicted to be displaced. Based on a 60% displacement rate and a 5% mortality rate, this equates to 0.35 birds from the SPA per breeding season (2x0.176) (Table 4-42).

In the non-breeding season, apportioning estimated that 2.4% of estimated puffin displacement mortality would involve puffins from the Blasket Islands SPA. Based on a 50% displacement rate and a 1%

mortality rate, this equates to zero birds from the SPA, as zero puffins were predicted to be displaced in the non-breeding season. Based on a 60% displacement rate and a 5% mortality rate, this also equates to zero birds from the SPA, as zero puffins were predicted to be displaced in the non-breeding season (Table 4-42).

Overall, total annual puffin displacement mortality based on a 50% displacement rate and a 1% mortality rate was predicted to involve zero puffins from the Blasket Islands SPA. Based on a 60% displacement rate and a 5% mortality rate in the breeding season and a 3% mortality rate in the non-breeding season, annual puffin displacement mortality was predicted to involve 0.35 puffins from the Blasket Islands SPA (Table 4-42).

The puffin breeding population at the Blasket Islands SPA is estimated to be 4,826 adult birds (Appendix 7), however there will also be immature birds reared at this SPA that form a component of the SPA population. Applying an immature to adult ratio of 0.842 (Horswill & Robinson, 2015), the total estimated SPA population (adults plus immatures) is 8,890 birds (Table 4-42). For this assessment the baseline annual mortality was calculated based on an estimated average puffin baseline mortality rate (all ages) of 0.177 (Horswill & Robinson, 2015). Applying this mortality rate, the estimated annual baseline mortality of puffins at the Blasket Islands SPA is 1,574 birds (8,890x 0.177).

Based on a 50% displacement rate and a 1% mortality rate, the additional annual predicted displacement mortality of zero puffins would increase the baseline mortality rate by 0%. Based on a 60% displacement rate and a 5% mortality rate in the breeding season and a 3% mortality rate in the non-breeding season, the additional annual predicted displacement mortality of 0.35 puffins would increase the baseline mortality rate by 0.02%.

As highlighted by Natural England guidance, where predicted impacts equate to 1% or below of baseline mortality for a population (e.g. colony population) then this level of impact could be considered non-significant (Parker *et al.,* 2022c). As the predicted increases in annual baseline displacement mortality for puffin were below 1%, PVA was not carried out on the Blasket Islands SPA puffin population, as agreed in the East Coast Phase 1 Method Statement (GoBe, 2022).

On this basis, there will be no adverse effect on the puffin qualifying feature of the Blasket Islands SPA, as defined by the COs for the site as a result of displacement effects from the Offshore Site.

In relation to the Blasket Islands SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.19 Puffin Island SPA (004003)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of the Puffin Island SPA which are listed in Table 3-11.

This SPA is supports internationally important populations of storm petrels and Manx shearwaters, as well as nationally important numbers of fulmars, lesser black-backed gulls, razorbills and puffins (NPWS, 2024).

Storm petrel has been screened out from further assessment on the basis that this species was only recorded in very low numbers (annual peak count of less than 10 birds) in each year of the site-specific baseline surveys. These infrequently occurring species were considered using expert judgement to be extremely unlikely to use the OAA in numbers large enough to warrant further consideration.

Manx shearwaters have a very large mean maximum foraging range (2,365.5 km) (Woodward *et al.,* 2019) therefore they are not considered to be at risk of displacement or barrier effects (e.g. Bradbury *et al.,* 2014). This species is also not considered to be at risk of collision impacts (e.g. Bradbury *et al.,*

2014) as birds typically fly low to the sea surface. On this basis, there is no adverse effect on this breeding QI species at this SPA.

Similarly, fulmars have a very large mean maximum foraging range of 1,200.2 km (Woodward *et al.,* 2019), therefore fulmars are not considered to be at risk of displacement or barrier effects (e.g. Dierschke *et al.*, 2016). Fulmars are also considered to have a low sensitivity to collisions with OWFs (e.g. Bradbury *et al.,* 2014), as birds typically fly low to the sea surface. On this basis, there is no adverse effect on this breeding QI species at this SPA.

The Offshore Site is outside the mean maximum foraging range of breeding razorbills from this SPA (Woodward *et al.,* 2019), therefore there is no risk that breeding adults from this SPA will be present in the OAA during the breeding season. On this basis, there is no adverse effect on this breeding species at this SPA.

As per Table 3-4, a source-pathway-receptor chain for adverse effects on two QI species of this SPA (lesser black-backed gull, and puffin) have been identified, as a result of potential collision and displacement impacts during the Operation and Maintenance phase. These potential impacts are assessed in the following sections.

4.2.4.19.1 Collision Risk

Lesser black-backed gull

The conservation objectives (COs) for lesser black-backed gull at the Puffin Island SPA are presented in Table 3-11. Collision impacts are limited to the Operation and Maintenance phase, as turbines will not be operating in the construction or decommissioning phases. It was considered that there was no other source-pathway-receptor chain for adverse effects for the other phases of development therefore the other phases of development are not considered within this assessment.

The Puffin Island SPA population of breeding lesser black-backed gulls in 2000 was 139 pairs (NPWS, 2024), which equates to 278 breeding adults. The breeding population recorded during the Seabirds Count 2015-2021 national census was 291 AON (582 breeding adults) (Appendix 7).

In the breeding season (April to August) the CRM assessment predicted that the mean number of lesser black-backed gull collisions per breeding season would involve 2.8 birds (Appendix 6). However, this includes non-breeding adults and immature birds, as well as breeding adults. As all aged lesser black-backed gulls recorded on baseline surveys in the breeding season were adults, (Appendix 5), it was assumed that 100% of the population present are adult birds, therefore breeding season lesser black-backed gull collision mortality was considered to involve 2.8 adult birds.

A proportion of adult birds present at colonies in the breeding season will opt not to breed in a particular breeding season. It has been estimated that 35% of adult lesser black-backed gulls may be "sabbatical" birds in any particular breeding season (RPS, 2022), and this has been applied for this assessment. On this basis, 0.97 adult lesser black-backed gulls predicted to collide were considered not to be breeding, therefore lesser black-backed gull collision mortality in the breeding season was considered to be 1.83 adult breeding birds.

In the autumn migration period and winter period of the non-breeding season, zero lesser black-backed collisions were predicted. In the spring migration period of the non-breeding season, the CRM assessment predicted that the mean number of lesser black-backed gull collisions per breeding season would involve 0.4 birds (Appendix 6) (Table 4-43).

Table 4-43 Estimated breeding season collision mortality for lesser black-backed gull from the Puffin Island SPA

Season	Estimated mortality	Most recent population (birds)	Apportioned colony percentage	Estimated SPA mortality
Breeding (Mar-Aug)	1.83 breeding adults	582 birds	0.3%	0.005 birds
Autumn migration (Sep-Oct)	0 birds	1,092 birds	0.6%	0 birds
Winter period (Nov-Feb)	0 birds	1,092 birds	2.0%	0 birds
Spring migration (Mar)	0.4 birds	1,092 birds	0.6%	0.002 birds
Total	2.23 birds	-	-	0.007 birds

In the breeding season, apportioning estimated that 0.3% of estimated lesser black-backed gull collision mortality (1.83 breeding adults) would involve breeding lesser black-backed gulls from the Puffin Island SPA. This equates to 0.005 birds from the SPA per breeding season (1.83x0.003) (Table 4-43).

In the autumn migration period of the non-breeding season, apportioning estimated that 0.6% of estimated lesser black-backed gull collision mortality (zero birds) would involve lesser black-backed gulls from the Puffin Island SPA. Therefore, estimated SPA mortality was zero birds in the autumn migration period, as no birds were predicted to collide in the autumn migration period (Table 4-43).

In the winter period of the non-breeding season, apportioning estimated that 2.0% of estimated lesser black-backed gull collision mortality (zero birds) would involve lesser black-backed gulls from the Puffin Island SPA. Therefore, estimated SPA mortality was zero birds in winter period, as no birds were predicted to collide in the winter period (Table 4-43).

In the spring migration period of the non-breeding season, apportioning estimated that 0.6% of estimated lesser black-backed gull collision mortality (0.4 birds) would involve lesser black-backed gulls from the Puffin Island SPA. This equates to 0.002 birds from the SPA per breeding season (0.4x0.006) (Table 4-43).

Overall, total annual lesser black-backed gull collision mortality (2.23 birds) was predicted to involve 0.007 lesser black-backed gulls from the Puffin Island SPA (Table 4-43).

The lesser black-backed gull breeding population at the Puffin Island SPA is estimated to be 582 adult birds (Appendix 7), however there will also be immature birds reared at this SPA that form a component of the SPA population. Applying an immature to adult ratio of 0.876 (Horswill & Robinson, 2015), the total estimated SPA population (adults plus immatures) is 1,092 birds (Table 4-43). For this assessment the baseline annual mortality was calculated based on an estimated average lesser black-backed gull baseline mortality rate (all ages) of 0.123 (Horswill & Robinson, 2015). Applying this mortality rate, the estimated annual baseline mortality of lesser black-backed gulls at the Puffin Island SPA is 134 birds (1,092 x 0.123). The additional annual predicted mortality of 0.007 lesser black-backed gulls would increase the baseline mortality rate by 0.005%.

As highlighted by Natural England guidance, where predicted impacts equate to 1% or below of baseline mortality for a population (e.g. colony population) then this level of impact could be considered non-significant (Parker *et al.,* 2022c). As the predicted increase in annual baseline mortality for lesser black-backed gull was below 1%, PVA was not carried out on the Puffin Island SPA lesser black-backed gull population, as agreed in the East Coast Phase 1 Method Statement (GoBe, 2022).

On this basis, there will be no adverse effect on the lesser black-backed gull qualifying feature of the Puffin Island SPA, as defined by the COs for the site as a result of collision effects from the Offshore Site.

4.2.4.19.2 Displacement

Puffin

The conservation objectives (COs) for puffin at the Puffin Island SPA are presented in Table 3-11. Displacement impacts are limited to the Operation and Maintenance phase, as turbines will not be operating in the construction or decommissioning phases. It was considered that there was no other source-pathway-receptor chain for adverse effects for the other phases of development therefore the other phases of development are not considered within this assessment.

The Puffin Island SPA population of breeding puffins in 2000 was 5,125 Apparently Occupied Burrows (AOB) (NPWS, 2024), which corresponds to 10,250 individuals. The breeding population recorded during the Seabirds Count 2015-2021 national census was 2,250 AOBs, which corresponds to 4,500 individuals (Appendix 7).

Based on the mean seasonal peak of puffins in the OAA and 2 km buffer, and a displacement rate of 50% and a mortality rate of 1%, displacement mortality was predicted to be zero birds in the breeding season. Based on a displacement rate of 60%, and a mortality rate of 3%, displacement mortality was predicted to be one puffin in the breeding season, increasing to two puffins, if a mortality rate of 5% was applied (Table 4-44).

For the non-breeding season in the OAA and 2 km buffer, and a displacement rate of 50% and a mortality rate of 1%, displacement mortality was predicted to be zero birds. Based on a displacement rate of 60%, and mortality rates of 1% and 3%, displacement mortality was also predicted to be zero birds (Table 4-44). Further details and the seasonal displacement matrices are presented in the Displacement Assessment Appendix (Appendix 9).

Table 4-44 Estimated breeding season displacement mortality for puffins from the Puffin Island SPA

Season	Estimated mortality	Most recent population (birds)	Apportioned colony percentage	Estimated SPA mortality
50% displacement and 1% mortality rate				
Breeding (Apr-early Aug)	0	4,500 birds	11.1%	0 birds
Non-breeding (mid-Aug-Mar)	0	8,289 birds	2.4%	0 birds
Annual total	0	-	-	0 birds
60% displacement and 5% mortality rate in breeding season; 3% in non-breeding season				

Season	Estimated mortality	Most recent population (birds)	Apportioned colony percentage	Estimated SPA mortality
Breeding (Apr-early Aug)	2	4,500 birds	11.1%	0.222 birds
Non-breeding (mid-Aug-Mar)	0	8,289 birds	2.4%	0 birds
Total	2	-	-	0.222 birds

In the breeding season, apportioning estimated that 11.1% of estimated puffin displacement mortality would involve breeding puffins from the Puffin Island SPA. Based on a 50% displacement rate and a 1% mortality rate, this equates to zero birds from the SPA per breeding season, as zero puffins were predicted to be displaced. Based on a 60% displacement rate and a 5% mortality rate, this equates to 0.222 birds from the SPA per breeding season (2x0.111) (Table 4-44).

In the non-breeding season, apportioning estimated that 2.4% of estimated puffin displacement mortality would involve puffins from the Puffin Island SPA. Based on a 50% displacement rate and a 1% mortality rate, this equates to zero birds from the SPA, as zero puffins were predicted to be displaced in the non-breeding season. Based on a 60% displacement rate and a 5% mortality rate, this also equates to zero birds from the SPA, as zero puffins were predicted to be displaced in the non-breeding season (Table 4-44).

Overall, total annual puffin displacement mortality based on a 50% displacement rate and a 1% mortality rate was predicted to involve zero puffins from the Puffin Island SPA. Based on a 60% displacement rate and a 5% mortality rate in the breeding season and a 3% mortality rate in the non-breeding season, annual puffin displacement mortality was predicted to involve 0.222 puffins from the Puffin Island SPA (Table 4-44).

The puffin breeding population at the Puffin Island SPA is estimated to be 4,500 adult birds (Appendix 7), however there will also be immature birds reared at this SPA that form a component of the SPA population. Applying an immature to adult ratio of 0.842 (Horswill & Robinson, 2015), the total estimated SPA population (adults plus immatures) is 8,289 birds (Table 4-44). For this assessment the baseline annual mortality was calculated based on an estimated average puffin baseline mortality rate (all ages) of 0.177 (Horswill & Robinson, 2015). Applying this mortality rate, the estimated annual baseline mortality of puffins at the Puffin Island SPA is 1,467 birds (8,289x 0.177).

Based on a 50% displacement rate and a 1% mortality rate, the additional annual predicted displacement mortality of zero puffins would increase the baseline mortality rate by 0%. Based on a 60% displacement rate and a 5% mortality rate in the breeding season and a 3% mortality rate in the non-breeding season, the additional annual predicted displacement mortality of 0.222 puffins would increase the baseline mortality rate by 0.015%.

As highlighted by Natural England guidance, where predicted impacts equate to 1% or below of baseline mortality for a population (e.g. colony population) then this level of impact could be considered non-significant (Parker *et al.,* 2022c). As the predicted increases in annual baseline displacement mortality for puffin were below 1%, PVA was not carried out on the Puffin Island SPA puffin population, as agreed in the East Coast Phase 1 Method Statement (GoBe, 2022).

On this basis, there will be no adverse effect on the puffin qualifying feature of the Puffin Island SPA, as defined by the COs for the site as a result of displacement effects from the Offshore Site.

In relation to the Puffin Island SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.20 Iveragh Peninsula SPA (004154)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of the Iveragh Peninsula SPA which are listed in Table 3-11.

This SPA is of ornithological importance as it supports nationally important breeding colonies of guillemots, fulmars and kittiwakes, as well as supporting breeding choughs and peregrines (NPWS, 2024).

Chough and peregrine are terrestrial species and there is no pathway for these species to be at risk of adverse effects from the Offshore Site, so they are not discussed further here.

Fulmars have a very large mean maximum foraging range of 1,200.2 km (Woodward *et al.,* 2019), they are not considered to be at risk of displacement or barrier effects (e.g. Dierschke *et al.*, 2016). Fulmars are also considered to have a low sensitivity to collisions with OWFs (e.g. Bradbury *et al.,* 2014), as birds typically fly low to the sea surface. On this basis, there is no adverse effect on this breeding QI species at this SPA.

The Offshore Site is outside the mean maximum foraging range of guillemots from this SPA (Woodward *et al.,* 2019), therefore there is no risk that breeding adults from this SPA will be present in the OAA during the breeding season. On this basis, there is no adverse effect LSE on this breeding species at this SPA.

As per Table 3-4, a source-pathway-receptor chain for adverse effects on one QI species of this SPA (kittiwake) has been identified, as a result of potential collision and displacement impacts during the Operation and Maintenance phase. These potential impacts are assessed in the following sections.

4.2.4.20.1 *Collision Risk*

Kittiwake

The conservation objectives (COs) for kittiwake at the Iveragh Peninsula SPA are presented in Table 3-11. Collision impacts are limited to the Operation and Maintenance phase, as turbines will not be operating in the construction or decommissioning phases. It was considered that there was no other source-pathway-receptor chain for adverse effects for the other phases of development therefore the other phases of development are not considered within this assessment.

The Iveragh Peninsula SPA population of breeding kittiwakes in 2000 was 1,150 pairs (NPWS, 2024), which equates to 2,300 breeding adults. The breeding population recorded during the Seabirds Count 2015-2021 national census was 994 AON (1,988 breeding adults) (Appendix 7).

In the breeding season (March to August) the CRM assessment predicted that the mean number of kittiwake collisions per breeding season would involve 4.4 birds (Appendix 6). However, this includes non-breeding adults and immature birds, as well as breeding adults. Based on the proportion of immature kittiwakes recorded on baseline surveys in the breeding season (Appendix 5), it was assumed that 91.95% of the population present are adult birds. This would mean that an estimated 4.0 kittiwakes predicted to collide during the breeding season would be adult birds.

Similarly, a proportion of adult birds present at colonies in the breeding season will opt not to breed in a particular breeding season. It has been estimated that 10% of adult kittiwakes may be “sabbatical” birds in any particular breeding season (Xodus, 2023), and this has been applied for this assessment. On this basis, 0.4 adult kittiwakes predicted to collide was considered not to be breeding. Therefore, adult kittiwake mortality in the breeding season was considered to involve 3.6 adult breeding birds and 0.4 non-breeding adults (Table 4-45).

In the autumn migration period of the non-breeding season, the CRM assessment predicted that the mean number of kittiwake collisions would involve 2.8 birds. In the spring migration period of the non-breeding season, the CRM assessment predicted that the mean number of kittiwake collisions would involve 1.0 birds (Table 4-45).

Table 4-45 Estimated breeding season collision mortality for kittiwakes from the Iveragh Peninsula SPA

Season	Estimated mortality	Most recent population (birds)	Apportioned colony percentage	Estimated SPA mortality
Breeding (Mar-Aug)	3.6 breeding adults	1,988 birds	0.9%	0.03 birds
Autumn migration	2.8 birds	3,774 birds	0.4%	0.01 birds
Spring migration	1.0 birds	3,774 birds	0.5%	0.005 birds
Total	8.2	-	-	0.045 birds

In the breeding season, apportioning estimated that 0.9% of estimated kittiwake collision mortality (3.6 breeding adults) would involve breeding kittiwakes from the Iveragh Peninsula SPA. This equates to 0.03 birds from the SPA per breeding season (3.6x0.009) (Table 4-45).

In the autumn migration period of the non-breeding season, apportioning estimated that 0.4% of estimated kittiwake collision mortality (2.8 birds) would involve kittiwakes from the Iveragh Peninsula SPA. Therefore, estimated SPA mortality was 0.01 birds in the autumn migration period (2.8x0.004) (Table 4-45).

In the spring migration period of the non-breeding season, apportioning estimated that 0.5% of estimated kittiwake collision mortality (1.0 birds) would involve kittiwakes from the Iveragh Peninsula SPA. This equates to 0.005 birds from the SPA per breeding season (1.0x0.005) (Table 4-45).

Overall, total annual kittiwake collision mortality (8.2 birds) was predicted to involve 0.045 kittiwakes from the Iveragh Peninsula SPA (Table 4-45).

The kittiwake breeding population at the Iveragh Peninsula SPA is estimated to be 1,988 adult birds (Appendix 7), however there will also be immature birds reared at this SPA that form a component of the SPA population. Applying an immature to adult ratio of 0.898 (Horswill & Robinson, 2015), the total estimated SPA population (adults plus immatures) is 3,774 birds (Table 4-45). For this assessment the baseline annual mortality was calculated based on an estimated average kittiwake baseline mortality rate (all ages) of 0.156 (Horswill & Robinson, 2015). Applying this mortality rate, the estimated annual baseline mortality of kittiwakes at the Iveragh Peninsula SPA is 589 birds (3,774 x 0.156). The additional annual predicted mortality of 0.045 kittiwakes would increase the baseline mortality rate by 0.008%.

As highlighted by Natural England guidance, where predicted impacts equate to 1% or below of baseline mortality for a population (e.g. colony population) then this level of impact could be considered non-significant (Parker *et al.,* 2022c). As the predicted increase in annual baseline mortality for kittiwake was below 1%, PVA was not carried out on the Iveragh Peninsula SPA kittiwake population, as agreed in the East Coast Phase 1 Method Statement (GoBe, 2022).

On this basis, there will be no adverse effect on the kittiwake qualifying feature of the Iveragh Peninsula SPA, as defined by the COs for the site as a result of collision effects from the Offshore Site.

4.2.4.20.2 *Displacement*

Kittiwake

The conservation objectives (COs) for kittiwake at the Iveragh Peninsula SPA are presented in Table 3-11. Displacement impacts are limited to the Operation and Maintenance phase, as turbines will not be operating in the construction or decommissioning phases. It was considered that there was no other source-pathway-receptor chain for adverse effects for the other phases of development therefore the other phases of development are not considered within this assessment.

The Iveragh Peninsula SPA population of breeding kittiwakes in 2000 was 1,150 pairs (NPWS, 2024), which equates to 2,300 breeding adults. The breeding population recorded during the Seabirds Count 2015-2021 national census was 994 AON (1,988 breeding adults) (Appendix 7).

Recent guidance for OWF projects in Scottish waters recommended that a displacement rate of 30% should be used for kittiwakes (NatureScot, 2023), and this displacement rate has been applied for this assessment. NatureScot guidance also recommended that mortality rates of 1% and 3% throughout the year should be used for kittiwake in displacement assessments (NatureScot, 2023). These mortality rates have also been applied for this assessment. Further details of the displacement assessment approach and the seasonal displacement matrices are presented in the Displacement Assessment Appendix (Appendix 9).

Due to the low numbers of birds involved, for the purposes of this assessment, it has been assumed that all predicted mortality involved adult breeding kittiwakes, which is considered to be precautionary, as both adult and immature kittiwakes were recorded in the Offshore Ornithology Study Area on baseline surveys throughout the year (Appendix 5).

In the breeding season, the mean seasonal peak of kittiwakes in the OAA plus 2 km buffer was 93 birds. Based on a displacement rate of 30%, this would mean that an estimated 28 kittiwakes would be displaced from the OAA and 2 km buffer in the breeding season. Applying a 1% mortality rate would therefore involve 0.28 kittiwakes. Applying a 3% mortality rate would involve 0.84 kittiwakes (Table 4-46).

In the autumn migration period of the non-breeding season, the mean seasonal peak of kittiwakes in the OAA plus 2 km buffer was 79 birds. Based on a displacement rate of 30%, this would mean that an estimated 24 kittiwakes would be displaced from the OAA and 2 km buffer in the autumn migration period. Applying a 1% mortality rate would therefore involve 0.24 kittiwakes. Applying a 3% mortality rate would involve 0.72 kittiwakes (Table 4-46).

In the spring migration period of the non-breeding season, the mean seasonal peak of kittiwakes in the OAA plus 2 km buffer was 144 birds. Based on a displacement rate of 30%, this would mean that an estimated 43 kittiwakes would be displaced from the OAA and 2 km buffer in the spring migration period. Applying a 1% mortality rate would therefore involve 0.43 kittiwakes. Applying a 3% mortality rate would involve 1.29 kittiwakes (Table 4-46).

Further details and the seasonal displacement matrices are presented in the Displacement Assessment Appendix (Appendix 9).

Table 4-46 Estimated breeding season displacement mortality for kittiwakes from the Iveragh Peninsula SPA

Season	Estimated mortality	Most recent population (birds)	Apportioned colony percentage	Estimated SPA mortality
30% displacement and 1% mortality rate				
Breeding (Mar-Aug)	0.28 birds	1,988 birds	0.9%	0.003 birds
Autumn migration (Sep-Dec)	0.24 birds	3,774 birds	0.4%	0.001 birds
Spring migration (Jan-Feb)	0.43 birds	3,774 birds	0.5%	0.002 birds
Annual total	0.95 birds	-	-	0.006 birds
30% displacement and 3% mortality rate				
Breeding (Mar-Aug)	0.84 birds	1,988 birds	0.9%	0.008 birds
Autumn migration (Sep-Dec)	0.72 birds	3,774 birds	0.4%	0.003 birds
Spring migration (Jan-Feb)	1.29 birds	3,774 birds	0.5%	0.006 birds
Total	2.85 birds	-	-	0.02 birds

In the breeding season, apportioning estimated that 0.9% of estimated kittiwake displacement mortality would involve breeding kittiwakes from the Iveragh Peninsula SPA. Based on a 30% displacement rate and a 1% mortality rate, this equates to 0.003 birds from the SPA per breeding season (0.28x0.009). Based on a 30% displacement rate and a 3% mortality rate, this equates to 0.008 birds from the SPA per breeding season (0.84x0.009) (Table 4-46).

In the autumn migration period of the non-breeding season, apportioning estimated that 0.4% of estimated kittiwake displacement mortality would involve kittiwakes from the Iveragh Peninsula SPA. Based on a 30% displacement rate and a 1% mortality rate, this equates to 0.001 birds from the SPA per breeding season (0.24x0.004). Based on a 30% displacement rate and a 3% mortality rate, this equates to 0.003 birds from the SPA per breeding season (0.72x0.004) (Table 4-46).

In the spring migration period of the non-breeding season, apportioning estimated that 0.5% of estimated kittiwake displacement mortality would involve kittiwakes from the Iveragh Peninsula SPA. Based on a 30% displacement rate and a 1% mortality rate, this equates to 0.002 birds from the SPA per breeding season (0.43x0.005). Based on a 30% displacement rate and a 3% mortality rate, this equates to 0.006 birds from the SPA per breeding season (1.29x0.005) (Table 4-46).

Overall, total annual kittiwake displacement mortality based on a 30% displacement rate and a 1% mortality rate was predicted to involve 0.006 kittiwakes from the Iveragh Peninsula SPA. Based on a

30% displacement rate and a 3% mortality rate, annual kittiwake displacement mortality was predicted to involve 0.02 kittiwakes from the Iveragh Peninsula SPA (Table 4-46).

The kittiwake breeding population at the Iveragh Peninsula SPA is estimated to be 1,988 adult birds (Appendix 7), however there will also be immature birds reared at this SPA that form a component of the SPA population. Applying an immature to adult ratio of 0.898 (Horswill & Robinson, 2015), the total estimated SPA population (adults plus immatures) is 3,774 birds (Table 4-46). For this assessment the baseline annual mortality was calculated based on an estimated average kittiwake baseline mortality rate (all ages) of 0.156 (Horswill & Robinson, 2015). Applying this mortality rate, the estimated annual baseline mortality of kittiwakes at the Iveragh Peninsula SPA is 589 birds (3,774 x 0.156).

Based on a 30% displacement rate and a 1% mortality rate, the additional annual predicted mortality of 0.006 kittiwakes would increase the baseline mortality rate by 0.001%. Based on a 30% displacement rate and a 3% mortality rate, the additional annual predicted mortality of 0.02 kittiwakes would increase the baseline mortality rate by 0.003%.

As highlighted by Natural England guidance, where predicted impacts equate to 1% or below of baseline mortality for a population (e.g. colony population) then this level of impact could be considered non-significant (Parker *et al.,* 2022c). As the predicted increases in annual baseline displacement mortality for kittiwake were below 1%, PVA was not carried out on the Iveragh Peninsula SPA kittiwake population, as agreed in the East Coast Phase 1 Method Statement (GoBe, 2022).

On this basis, there will be no adverse effect on the kittiwake qualifying feature of the Iveragh Peninsula SPA, as defined by the COs for the site as a result of displacement effects from the Offshore Site.

In relation to the Iveragh Peninsula SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.21 Skelligs SPA (004007)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of the Skelligs SPA which are listed in Table 3-11.

This SPA supports internationally important breeding numbers of storm petrels and gannets, as well as supporting an assemblage of over 20,000 breeding seabirds. The site also holds nationally important breeding populations of fulmars, Manx shearwaters, kittiwakes, guillemots and puffins (NPWS, 2024).

Storm petrel has been screened out from further assessment on the basis that this species was only recorded in very low numbers (annual peak count of less than 10 birds) in each year of the site-specific baseline surveys. These infrequently occurring species were considered using expert judgement to be extremely unlikely to use the OAA in numbers large enough to warrant further consideration.

Manx shearwaters have a very large mean maximum foraging range (2,365.5 km) (Woodward *et al.,* 2019) therefore they are not considered to be at risk of displacement or barrier effects (e.g. Bradbury *et al.,* 2014). This species is also not considered to be at risk of collision impacts (e.g. Bradbury *et al.,* 2014) as birds typically fly low to the sea surface. On this basis, there is no adverse effect on this breeding QI species at this SPA.

Similarly, fulmars have a very large mean maximum foraging range of 1,200.2 km (Woodward *et al.,* 2019), therefore fulmars are not considered to be at risk of displacement or barrier effects (e.g. Dierschke *et al.*, 2016). Fulmars are also considered to have a low sensitivity to collisions with OWFs (e.g. Bradbury *et al.,* 2014), as birds typically fly low to the sea surface. On this basis, there is no adverse effect on this breeding QI species at this SPA was screened out.

The Offshore Site is outside the mean maximum foraging range of breeding guillemots from this SPA (Woodward *et al.,* 2019), therefore there is no risk that breeding adults from this SPA will be present in the OAA during the breeding season. On this basis, there is no adverse effect on this breeding species at this SPA.

As per Table 3-4, a source-pathway-receptor chain for adverse effects on three QI species of this SPA (gannet, kittiwake and puffin) has been identified, as a result of potential collision and displacement impacts during the Operation and Maintenance phase. These potential impacts are assessed in the following sections.

4.2.4.21.1 Collision Risk

Gannet

The conservation objectives (COs) for gannet at the Skelligs SPA are presented in Table 3-11. Collision impacts are limited to the Operation and Maintenance phase, as turbines will not be operating in the construction or decommissioning phases. It was considered that there was no other source-pathway-receptor chain for adverse effects for the other phases of development therefore the other phases of development are not considered within this assessment.

The Skelligs SPA population of breeding gannets in 2004 was 29,683 pairs (NPWS, 2024), which equates to 59,726 breeding adults. The breeding population recorded in the 2014 national census was 35,294 Apparently Occupied Sites (AOS) (70,588 breeding adults) (Appendix 7).

In the breeding season (March to September), the total mean estimated number of gannet collisions was 0.7 bird (Appendix 6). As this number is very small, it was considered that there was no requirement to take account of non-breeding adults and immature birds, therefore, breeding season gannet collision mortality was considered to involve 0.7 breeding adult birds.

For the autumn and spring migration periods, estimated seasonal gannet mortality from collision was zero birds. Overall, predicted annual gannet mortality due to collision effects involved 0.7 gannets (Appendix 6) (Table 4-47).

Table 4-47 Estimated breeding season collision mortality for gannets from the Skelligs SPA

Season	Estimated mortality	Most recent population (birds)	Apportioned colony percentage	Estimated SPA mortality
Breeding (Mar-Sep)	0.7	70,588 birds	80.6%	0.56 birds
Autumn migration (Oct-Nov)	0	124,306	18.8%	0 birds
Spring migration (Dec-Feb)	0	124,306	16.1%	0 birds
Total	0.7	-	-	0.56 birds

In the breeding season, apportioning estimated that 80.6% of estimated gannet collision mortality (0.7 birds) would involve breeding gannets from the Skelligs SPA. This equates to 0.56 birds from the SPA per breeding season (0.7x0.806) (Table 4-47).

In the autumn migration period of the non-breeding season, apportioning estimated that 18.8% of estimated gannet collision mortality (zero birds) would involve gannets from the Skelligs SPA. Therefore, estimated SPA mortality was zero birds in the autumn migration period as no gannets were predicted to collide with turbines (Table 4-47).

In the spring migration period of the non-breeding season, apportioning estimated that 16.1% of estimated gannet collision mortality (zero birds) would involve gannets from the Skelligs SPA. Therefore, estimated SPA mortality was zero birds in the spring migration period as no gannets were predicted to collide with turbines (Table 4-47).

Overall, total annual gannet collision mortality (0.7 birds) was predicted to involve 0.56 gannets from the Skelligs SPA (Table 4-47).

The gannet breeding population at the Skelligs SPA is estimated to be 70,588 adult birds (Appendix 7), however there will also be immature birds reared at this SPA that form a component of the SPA population. Applying an immature to adult ratio of 0.761 (Horswill & Robinson, 2015), the total estimated SPA population (adults plus immatures) is 124,306 birds (Table 4-47). For this assessment the baseline annual mortality was calculated based on an estimated average gannet baseline mortality rate (all ages) of 0.181 (Horswill & Robinson, 2015). Applying this mortality rate, the estimated annual baseline mortality of gannets at the Skelligs SPA is 22,499 birds (124,306 x 0.181). The additional annual predicted mortality of 0.56 gannets would increase the baseline mortality rate by 0.002%.

As highlighted by Natural England guidance, where predicted impacts equate to 1% or below of baseline mortality for a population (e.g. colony population) then this level of impact could be considered non-significant (Parker *et al.,* 2022c). As the predicted increase in annual baseline mortality for gannet was below 1%, PVA was not carried out on the Skelligs SPA gannet population, as agreed in the East Coast Phase 1 Method Statement (GoBe, 2022).

On this basis, there will be no adverse effect on the gannet qualifying feature of the Skelligs SPA, as defined by the COs for the site as a result of collision effects from the Offshore Site.

Kittiwake

The conservation objectives (COs) for kittiwake at the Skelligs SPA are presented in Table 3-11. Collision impacts are limited to the Operation and Maintenance phase, as turbines will not be operating in the construction or decommissioning phases. It was considered that there was no other source-pathway-receptor chain for adverse effects for the other phases of development therefore the other phases of development are not considered within this assessment.

The Skelligs SPA population of breeding kittiwakes in 2002 was 1,035 pairs (NPWS, 2024), which equates to 2,070 breeding adults. The breeding population recorded during the Seabirds Count 2015-2021 national census was 966 AON (1,932 breeding adults) (Appendix 7).

In the breeding season (March to August) the CRM assessment predicted that the mean number of kittiwake collisions per breeding season would involve 4.4 birds (Appendix 6). However, this includes non-breeding adults and immature birds, as well as breeding adults. Based on the proportion of immature kittiwakes recorded on baseline surveys in the breeding season (Appendix 5), it was assumed that 91.95% of the population present are adult birds. This would mean that an estimated 4.0 kittiwakes predicted to collide during the breeding season would be adult birds.

Similarly, a proportion of adult birds present at colonies in the breeding season will opt not to breed in a particular breeding season. It has been estimated that 10% of adult kittiwakes may be “sabbatical” birds in any particular breeding season (Xodus, 2023), and this has been applied for this assessment. On this basis, 0.4 adult kittiwakes predicted to collide was considered not to be breeding. Therefore, adult kittiwake mortality in the breeding season was considered to involve 3.6 adult breeding birds and 0.4 non-breeding adults (Table 4-48).

In the autumn migration period of the non-breeding season, the CRM assessment predicted that the mean number of kittiwake collisions would involve 2.8 birds. In the spring migration period of the non-breeding season, the CRM assessment predicted that the mean number of kittiwake collisions would involve 1.0 birds (Table 4-48).

Table 4-48 Estimated breeding season collision mortality for kittiwakes from the Skelligs SPA

Season	Estimated mortality	Most recent population (birds)	Apportioned colony percentage	Estimated SPA mortality
Breeding (Mar-Aug)	3.6 breeding adults	1,932 birds	0.8%	0.03 birds
Autumn migration	2.8 birds	3,667 birds	0.4%	0.01 birds
Spring migration	1.0 birds	3,667 birds	0.5%	0.005 birds
Total	8.2	-	-	0.045 birds

8In the breeding season, apportioning estimated that 0.8% of estimated kittiwake collision mortality (3.6 breeding adults) would involve breeding kittiwakes from the Skelligs SPA. This equates to 0.03 birds from the SPA per breeding season (3.6x0.008) (Table 4-48).

In the autumn migration period of the non-breeding season, apportioning estimated that 0.4% of estimated kittiwake collision mortality (2.8 birds) would involve kittiwakes from the Skelligs SPA. Therefore, estimated SPA mortality was 0.01 birds in the autumn migration period (2.8x0.004) (Table 4-48).

In the spring migration period of the non-breeding season, apportioning estimated that 0.5% of estimated kittiwake collision mortality (1.0 birds) would involve kittiwakes from the Skelligs SPA. This equates to 0.005 birds from the SPA per breeding season (1.0x0.005) (Table 4-48).

Overall, total annual kittiwake collision mortality (8.2 birds) was predicted to involve 0.045 kittiwakes from the Skelligs SPA (Table 4-48).

The kittiwake breeding population at the Skelligs SPA is estimated to be 1,932 adult birds (Appendix 7), however there will also be immature birds reared at this SPA that form a component of the SPA population. Applying an immature to adult ratio of 0.898 (Horswill & Robinson, 2015), the total estimated SPA population (adults plus immatures) is 3,667 birds (Table 4-48). For this assessment the baseline annual mortality was calculated based on an estimated average kittiwake baseline mortality rate (all ages) of 0.156 (Horswill & Robinson, 2015). Applying this mortality rate, the estimated annual baseline mortality of kittiwakes at the Skelligs SPA is 572 birds (3,667 x 0.156). The additional annual predicted mortality of 0.045 kittiwakes would increase the baseline mortality rate by 0.008%.

As highlighted by Natural England guidance, where predicted impacts equate to 1% or below of baseline mortality for a population (e.g. colony population) then this level of impact could be considered non-significant (Parker *et al.,* 2022c). As the predicted increase in annual baseline mortality for kittiwake was below 1%, PVA was not carried out on the Skelligs SPA kittiwake population, as agreed in the East Coast Phase 1 Method Statement (GoBe, 2022).

On this basis, there will be no adverse effect on the kittiwake qualifying feature of the Skelligs SPA, as defined by the COs for the site as a result of collision effects from the Offshore Site.

4.2.4.21.2 Displacement

Gannet

The conservation objectives (COs) for gannet at the Skelligs SPA are presented in Table 3-11. Displacement impacts are limited to the Operation and Maintenance phase, as turbines will not be operating in the construction or decommissioning phases. It was considered that there was no other source-pathway-receptor chain for adverse effects for the other phases of development therefore the other phases of development are not considered within this assessment.

The Skelligs SPA population of breeding gannets in 2004 was 29,683 pairs (NPWS, 2024), which equates to 59,726 breeding adults. The breeding population recorded in the 2014 national census was 35,294 Apparently Occupied Sites (AOS) (70,588 breeding adults) (Appendix 7).

In the breeding season, based on a displacement rate of 70%, 51 gannets were predicted to be displaced from the OAA and 2 km buffer. However, this includes non-breeding adults and immature birds, as well as breeding adults. In the breeding season (March to September) age was recorded for 85 gannets on baseline surveys, with 34% of birds aged as adults and 66% of birds aged as immature (Appendix 5). Based on this breakdown, it has been assumed that an estimated displacement of 51 gannets would involve 17 adult birds and 34 immature birds.

Due to the low numbers of birds involved, for the purposes of this assessment, it has been assumed that all predicted mortality involved adult breeding gannets, which is considered to be precautionary. Therefore, it was assumed that based on a displacement mortality rate of 1%, displacement mortality was predicted to involve one adult gannet in the breeding season. Based on a mortality rate of 3%, displacement mortality was predicted to involve two adult gannets in the breeding season (Table 4-49).

In the autumn migration period of the non-breeding season, based on a displacement rate of 70%, 50 gannets (all ages) were predicted to be displaced. Applying a mortality rate of 1% would result in a predicted mortality of one gannet. Applying a mortality rate of 3% would result in a predicted mortality of two gannets.

In the spring migration period of the non-breeding season, based on a displacement rate of 70%, four gannets (all ages) were predicted to be displaced. Applying a mortality rate of 1%, the predicted additional mortality due to displacement effects was zero gannets in the spring migration period. Similarly, applying a mortality rate of 3%, the predicted additional mortality due to displacement effects was zero gannets (Table 4-49). Further details and the seasonal displacement matrices are presented in the Displacement Assessment Appendix (Appendix 9).

Table 4-49 Estimated breeding season displacement mortality for gannets from the Skelligs SPA

Season	Estimated mortality	Most recent population (birds)	Apportioned colony percentage	Estimated SPA mortality
70% displacement and 1% mortality rate				
Breeding (Mar-Sep)	1 adult	70,588	80.6%	0.81 birds
Autumn migration (Oct-Nov)	1 bird	124,306	18.8%	0.19 birds
Spring migration (Dec-Feb)	0 birds	124,306	16.1%	0 birds

Season	Estimated mortality	Most recent population (birds)	Apportioned colony percentage	Estimated SPA mortality
Annual total	0	-	-	1 bird
70% displacement and 3% mortality rate				
Breeding (Mar-Sep)	2 adults	70,588	80.6%	1.61 birds
Autumn migration (Oct-Nov)	2 birds	124,306	18.8%	0.38 birds
Spring migration (Dec-Feb)	0 birds	124,306	16.1%	0 birds
Total	4 birds	-	-	2 birds

In the breeding season, apportioning estimated that 80.6% of estimated gannet displacement mortality would involve breeding gannets from the Skelligs SPA. Based on a 70% displacement rate and a 1% mortality rate, this equates to 0.81 birds from the SPA per breeding season (1x0.806). Based on a 70% displacement rate and a 3% mortality rate, this equates to 1.61 birds from the SPA per breeding season (2x0.806) (Table 4-49).

In the autumn migration period of the non-breeding season, apportioning estimated that 18.8% of estimated gannet displacement mortality would involve gannets from the Skelligs SPA. Based on a 70% displacement rate and a 1% mortality rate, this equates to 0.19 birds from the SPA, in the autumn migration period (1x0.188). Based on a 70% displacement rate and a 3% mortality rate, this equates to 0.38 birds from the SPA, in the spring migration period (2x0.188) (Table 4-49).

In the spring migration period of the non-breeding season, apportioning estimated that 16.1% of estimated gannet displacement mortality would involve gannets from the Skelligs SPA. This equates to zero birds from the SPA as zero gannets were predicted to be displaced in the spring migration period. Based on a 70% displacement rate and a 3% mortality rate, this also equates to zero birds from the SPA, as zero gannets were predicted to be displaced in the spring migration period (Table 4-49).

Overall, total annual gannet displacement mortality based on a 70% displacement rate and a 1% mortality rate was predicted to involve one gannet from the Skelligs SPA. Based on a 70% displacement rate and a 3% mortality rate, annual gannet displacement mortality was predicted to involve two gannets from the Skelligs SPA (Table 4-49).

The gannet breeding population at the Skelligs SPA is estimated to be 70,588 adult birds (Appendix 7), however there will also be immature birds reared at this SPA that form a component of the SPA population. Applying an immature to adult ratio of 0.761 (Horswill & Robinson, 2015), the total estimated SPA population (adults plus immatures) is 124,306 birds (Table 4-49). For this assessment the baseline annual mortality was calculated based on an estimated average gannet baseline mortality rate (all ages) of 0.181 (Horswill & Robinson, 2015). Applying this mortality rate, the estimated annual baseline mortality of gannets at the Skelligs SPA is 22,499 birds (124,306 x 0.181).

Based on a 70% displacement rate and a 1% mortality rate, the additional annual predicted mortality of one gannet would increase the baseline mortality rate by 0.004%. Based on a 70% displacement rate and a 3% mortality rate, the additional annual predicted mortality of two gannets would increase the baseline mortality rate by 0.009%.

As highlighted by Natural England guidance, where predicted impacts equate to 1% or below of baseline mortality for a population (e.g. colony population) then this level of impact could be considered non-significant (Parker *et al.,* 2022c). As the predicted increases in annual baseline displacement mortality for gannet were below 1%, PVA was not carried out on the Skelligs SPA gannet population, as agreed in the East Coast Phase 1 Method Statement (GoBe, 2022).

On this basis, there will be no adverse effect on the gannet qualifying feature of the Skelligs SPA, as defined by the COs for the site as a result of displacement effects from the Offshore Site.

Kittiwake

The conservation objectives (COs) for kittiwake at the Skelligs SPA are presented in Table 3-11. Displacement impacts are limited to the Operation and Maintenance phase, as turbines will not be operating in the construction or decommissioning phases. It was considered that there was no other source-pathway-receptor chain for adverse effects for the other phases of development therefore the other phases of development are not considered within this assessment.

The Skelligs SPA population of breeding kittiwakes in 2002 was 1,035 pairs (NPWS, 2024), which equates to 2,070 breeding adults. The breeding population recorded during the Seabirds Count 2015-2021 national census was 966 AON (1,932 breeding adults) (Appendix 7).

Recent guidance for OWF projects in Scottish waters recommended that a displacement rate of 30% should be used for kittiwakes (NatureScot, 2023), and this displacement rate has been applied for this assessment. NatureScot guidance also recommended that mortality rates of 1% and 3% throughout the year should be used for kittiwake in displacement assessments (NatureScot, 2023). These mortality rates have also been applied for this assessment. Further details of the displacement assessment approach and the seasonal displacement matrices are presented in the Displacement Assessment Appendix (Appendix 9).

Due to the low numbers of birds involved, for the purposes of this assessment, it has been assumed that all predicted mortality involved adult breeding kittiwakes, which is considered to be precautionary, as both adult and immature kittiwakes were recorded in the Offshore Ornithology Study Area on baseline surveys throughout the year (Appendix 5).

In the breeding season, the mean seasonal peak of kittiwakes in the OAA plus 2 km buffer was 93 birds. Based on a displacement rate of 30%, this would mean that an estimated 28 kittiwakes would be displaced from the OAA and 2 km buffer in the breeding season. Applying a 1% mortality rate would therefore involve 0.28 kittiwakes. Applying a 3% mortality rate would involve 0.84 kittiwakes (Table 4-50).

In the autumn migration period of the non-breeding season, the mean seasonal peak of kittiwakes in the OAA plus 2 km buffer was 79 birds. Based on a displacement rate of 30%, this would mean that an estimated 24 kittiwakes would be displaced from the OAA and 2 km buffer in the autumn migration period. Applying a 1% mortality rate would therefore involve 0.24 kittiwakes. Applying a 3% mortality rate would involve 0.72 kittiwakes (Table 4-50).

In the spring migration period of the non-breeding season, the mean seasonal peak of kittiwakes in the OAA plus 2 km buffer was 144 birds. Based on a displacement rate of 30%, this would mean that an estimated 43 kittiwakes would be displaced from the OAA and 2 km buffer in the spring migration period. Applying a 1% mortality rate would therefore involve 0.43 kittiwakes. Applying a 3% mortality rate would involve 1.29 kittiwakes (Table 4-50).

Further details and the seasonal displacement matrices are presented in the Displacement Assessment Appendix (Appendix 9).

Table 4-50 Estimated breeding season displacement mortality for kittiwakes from the Skelligs SPA

Season	Estimated mortality	Most recent population (birds)	Apportioned colony percentage	Estimated SPA mortality
30% displacement and 1% mortality rate				
Breeding (Mar-Aug)	0.28 birds	1,932 birds	0.8%	0.002 birds
Autumn migration (Sep-Dec)	0.24 birds	3,667 birds	0.4%	0.001 birds
Spring migration (Jan-Feb)	0.43 birds	3,667 birds	0.5%	0.002 birds
Annual total	0.95 birds	-	-	0.005 birds
30% displacement and 3% mortality rate				
Breeding (Mar-Aug)	0.84 birds	1,932 birds	0.8%	0.007 birds
Autumn migration (Sep-Dec)	0.72 birds	3,667 birds	0.4%	0.003 birds
Spring migration (Jan-Feb)	1.29 birds	3,667 birds	0.5%	0.006 birds
Total	2.85 birds	-	-	0.02 birds

In the breeding season, apportioning estimated that 0.8% of estimated kittiwake displacement mortality would involve breeding kittiwakes from the Skelligs SPA. Based on a 30% displacement rate and a 1% mortality rate, this equates to 0.002 birds from the SPA per breeding season (0.28x0.008). Based on a 30% displacement rate and a 3% mortality rate, this equates to 0.007 birds from the SPA per breeding season (0.84x0.008) (Table 4-50).

In the autumn migration period of the non-breeding season, apportioning estimated that 0.4% of estimated kittiwake displacement mortality would involve kittiwakes from the Skelligs SPA. Based on a 30% displacement rate and a 1% mortality rate, this equates to 0.001 birds from the SPA per breeding season (0.24x0.004). Based on a 30% displacement rate and a 3% mortality rate, this equates to 0.003 birds from the SPA per breeding season (0.72x0.004) (Table 4-50).

In the spring migration period of the non-breeding season, apportioning estimated that 0.5% of estimated kittiwake displacement mortality would involve kittiwakes from the Skelligs SPA. Based on a 30% displacement rate and a 1% mortality rate, this equates to 0.002 birds from the SPA per breeding season (0.43x0.005). Based on a 30% displacement rate and a 3% mortality rate, this equates to 0.006 birds from the SPA per breeding season (1.29x0.005) (Table 4-50).

Overall, total annual kittiwake displacement mortality based on a 30% displacement rate and a 1% mortality rate was predicted to involve 0.005 kittiwakes from the Skelligs SPA. Based on a 30%

displacement rate and a 3% mortality rate, annual kittiwake displacement mortality was predicted to involve 0.02 kittiwakes from the Skelligs SPA (Table 4-50).

The kittiwake breeding population at the Skelligs SPA is estimated to be 1,932 adult birds (Appendix 7), however there will also be immature birds reared at this SPA that form a component of the SPA population. Applying an immature to adult ratio of 0.898 (Horswill & Robinson, 2015), the total estimated SPA population (adults plus immatures) is 3,667 birds (Table 4-50). For this assessment the baseline annual mortality was calculated based on an estimated average kittiwake baseline mortality rate (all ages) of 0.156 (Horswill & Robinson, 2015). Applying this mortality rate, the estimated annual baseline mortality of kittiwakes at the Skelligs SPA is 572 birds (3,667 x 0.156).

Based on a 30% displacement rate and a 1% mortality rate, the additional annual predicted mortality of 0.005 kittiwakes would increase the baseline mortality rate by 0.001%. Based on a 30% displacement rate and a 3% mortality rate, the additional annual predicted mortality of 0.02 kittiwakes would increase the baseline mortality rate by 0.003%.

As highlighted by Natural England guidance, where predicted impacts equate to 1% or below of baseline mortality for a population (e.g. colony population) then this level of impact could be considered non-significant (Parker *et al.,* 2022c). As the predicted increases in annual baseline displacement mortality for kittiwake were below 1%, PVA was not carried out on the Skelligs SPA kittiwake population, as agreed in the East Coast Phase 1 Method Statement (GoBe, 2022).

On this basis, there will be no adverse effect on the kittiwake qualifying feature of the Skelligs SPA, as defined by the COs for the site as a result of displacement effects from the Offshore Site.

Puffin

The conservation objectives (COs) for puffin at the Skelligs SPA are presented in Table 3-11. Displacement impacts are limited to the Operation and Maintenance phase, as turbines will not be operating in the construction or decommissioning phases. It was considered that there was no other source-pathway-receptor chain for adverse effects for the other phases of development therefore the other phases of development are not considered within this assessment.

The Skelligs SPA population of breeding puffins in 2002 was 6,000 (AOB) (NPWS, 2024), which corresponds to 12,000 individuals. The breeding population recorded during the Seabirds Count 2015-2021 national census was 6,808 AOBs, which corresponds to 13,616 individuals (Appendix 7).

Based on the mean seasonal peak of puffins in the OAA and 2 km buffer, and a displacement rate of 50% and a mortality rate of 1%, displacement mortality was predicted to be zero birds in the breeding season. Based on a displacement rate of 60%, and a mortality rate of 3%, displacement mortality was predicted to be one puffin in the breeding season, increasing to two puffins, if a mortality rate of 5% was applied (Table 4-51).

For the non-breeding season in the OAA and 2 km buffer, and a displacement rate of 50% and a mortality rate of 1%, displacement mortality was predicted to be zero birds. Based on a displacement rate of 60%, and mortality rates of 1% and 3%, displacement mortality was also predicted to be zero birds (Table 4-51). Further details and the seasonal displacement matrices are presented in the Displacement Assessment Appendix (Appendix 9).

Table 4-51 Estimated breeding season displacement mortality for puffins from the Skelligs SPA

Season	Estimated mortality	Most recent population (birds)	Apportioned colony percentage	Estimated SPA mortality
50% displacement and 1% mortality rate				

Season	Estimated mortality	Most recent population (birds)	Apportioned colony percentage	Estimated SPA mortality
Breeding (Apr-early Aug)	0	13,616	29.9%	0 birds
Non-breeding (mid-Aug-Mar)	0	25,081	7.3%	0 birds
Annual total	0	-	-	0 birds
60% displacement and 5% mortality rate in breeding season; 3% in non-breeding season				
Breeding (Apr-early Aug)	2	13,616	29.9%	0.6 birds
Non-breeding (mid-Aug-Mar)	0	25,081	7.3%	0 birds
Total	2	-	-	0.6 birds

In the breeding season, apportioning estimated that 29.9% of estimated puffin displacement mortality would involve breeding puffins from the Skelligs SPA. Based on a 50% displacement rate and a 1% mortality rate, this equates to zero birds from the SPA per breeding season, as zero puffins were predicted to be displaced. Based on a 60% displacement rate and a 5% mortality rate, this equates to 0.6 birds from the SPA per breeding season (2x0.299) (Table 4-51).

In the non-breeding season, apportioning estimated that 7.3% of estimated puffin displacement mortality would involve puffins from the Skelligs SPA. Based on a 50% displacement rate and a 1% mortality rate, this equates to zero birds from the SPA, as zero puffins were predicted to be displaced in the non-breeding season. Based on a 60% displacement rate and a 5% mortality rate, this also equates to zero birds from the SPA, as zero puffins were predicted to be displaced in the non-breeding season (Table 4-51).

Overall, total annual puffin displacement mortality based on a 50% displacement rate and a 1% mortality rate was predicted to involve zero puffins from the Skelligs SPA. Based on a 60% displacement rate and a 5% mortality rate in the breeding season and a 3% mortality rate in the non-breeding season, annual puffin displacement mortality was predicted to involve 0.6 puffins from the Skelligs SPA (Table 4-51).

The puffin breeding population at the Skelligs SPA is estimated to be 13,616 adult birds (Appendix 7), however there will also be immature birds reared at this SPA that form a component of the SPA population. Applying an immature to adult ratio of 0.842 (Horswill & Robinson, 2015), the total estimated SPA population (adults plus immatures) is 25,081 birds (Table 4-51). For this assessment the baseline annual mortality was calculated based on an estimated average puffin baseline mortality rate (all ages) of 0.177 (Horswill & Robinson, 2015). Applying this mortality rate, the estimated annual baseline mortality of puffins at the Skelligs SPA is 4,439 birds (25,081 x 0.177).

Based on a 50% displacement rate and a 1% mortality rate, the additional annual predicted displacement mortality of zero puffins would increase the baseline mortality rate by 0%. Based on a 60% displacement rate and a 5% mortality rate in the breeding season and a 3% mortality rate in the non-breeding season, the additional annual predicted displacement mortality of 0.6 puffins would increase the baseline mortality rate by 0.014%.

As highlighted by Natural England guidance, where predicted impacts equate to 1% or below of baseline mortality for a population (e.g. colony population) then this level of impact could be considered non-significant (Parker *et al.,* 2022c). As the predicted increases in annual baseline displacement mortality for puffin were below 1%, PVA was not carried out on the Skelligs SPA puffin population, as agreed in the East Coast Phase 1 Method Statement (GoBe, 2022).

On this basis, there will be no adverse effect on the puffin qualifying feature of the Skelligs SPA, as defined by the COs for the site as a result of displacement effects from the Offshore Site.

In relation to the Skelligs SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.22 Stags of Broadhaven SPA (004072)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of the Stags of Broadhaven SPA which are listed in Table 3-11.

This SPA is of ornithological importance owing to the presence of the only known breeding colony of Leach's petrel in Ireland, as well as a nationally important breeding population of storm petrels (NPWS, 2024).

Leach's petrel has been excluded from further assessment on the basis that this species was not recorded within the OAA on baseline surveys (Appendix 5). Where seabird species were not recorded in the OAA over the duration of site-specific baseline surveys (24 months), it is considered objectively reasonable using expert judgement to exclude them from further assessment. Seabird species that were not recorded in the OAA on baseline surveys were considered extremely unlikely to use the OAA in numbers large enough to warrant further consideration.

Storm petrel has been excluded from further assessment on the basis that this species was only recorded in very low numbers (annual peak count of less than 10 birds) in each year of the site-specific baseline surveys (Appendix 5). These infrequently occurring species were considered using expert judgement to be extremely unlikely to use the OAA in numbers large enough to warrant further consideration.

On this basis, there is no adverse effect on these breeding QI species at this SPA.

In relation to the Stags of Broadhaven SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.23 Eirk Bog SPA (004108)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of the Eirk Bog SPA which are listed in Table 3-11.

This SPA is used as a feeding site by Greenland white-fronted geese from the Killarney Valley flock. This small flock (<20) is the most southerly in Ireland and is one of the few flocks that continue to utilise peatland habitats (NPWS, 2024).

This SPA was screened in in the migratory CRM assessment (Appendix 6) as at least 10% of modelled migration flightlines between this SPA and Iceland and Greenland were predicted to pass through the OAA. Designated migratory QI species for each SPA were screened in based on where at least 1% of the Irish population of each species was expected to pass through the OAA each year. This was the case for Greenland white-fronted goose.

Based on the above, a source-pathway-receptor chain for adverse effects on one QI species of this SPA (Greenland white-fronted goose) has been identified, as a result of potential collision impacts during the Operation and Maintenance phase. These potential impacts are assessed in the following sections.

4.2.4.23.1 Collision Risk

Greenland white-fronted goose

The conservation objectives (COs) for the Eirk Bog SPA are presented in Table 3-11. Collision impacts are limited to the Operation and Maintenance phase, as turbines will not be operating in the construction or decommissioning phases. It was considered that there was no other source-pathway-receptor chain for adverse effects for the other phases of development therefore the other phases of development are not considered within this assessment.

The population estimate of Greenland white-fronted goose for the Eirk Bog SPA and the estimated proportion of the SPA population at risk of collision passing through the OAA are shown in Table 4-52. The count year is shown in brackets.

Table 4-52 Population estimates of screened-in species from the Eirk Bog SPA passing through the OAA and the proportion of birds at risk of collision for each assessed species.

Species	Population estimate	Proportion at risk of collision
Greenland white-fronted goose	<20 (2014)[a]	0.267

[a]*Lewis et al. (2019)*

The results of the mCRM for screened in species from the Eirk Bog SPA are presented in Table 4-53.

Table 4-53 Seasonal and annual collision estimates from the OAA for the Eirk Bog SPA of screened in migratory non-seabird QI species.

Species	Pre-breeding	Post-breeding	Other	Total
Greenland white-fronted goose	0.000 ± 0.000	0.000 ± 0.000	0.000 ± 0.000	0.000 ± 0.000

The analysis of migration collisions for this qualifying species for the Eirk Bog SPA show that zero collisions are expected annually. The proportion of this species using this SPA as a staging post or wintering area that are at risk of collision with the Project is extremely small.

On this basis, there will be no adverse effect on the Greenland white-fronted goose qualifying feature of the Eirk Bog SPA, as defined by the COs for the site as a result of collision effects from the Offshore Site.

In relation to the Eirk Bog SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.24 The Gearagh SPA (004109)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of The Gearagh SPA which are listed in Table 3-11.

At the time this site was designated as an SPA it was utilised by nationally important populations of four species, wigeon, teal, mallard and coot, and each of these species is regarded as a special conservation interest for this SPA. In addition, the wetlands and associated waterbirds within this site are of special conservation interest for Wetland & Waterbirds (NPWS, 2024).

There will be no adverse effects on the Wetlands and Waterfowl QI for this SPA as the Project avoids activity within this SPA.

This SPA was screened in in the migratory CRM assessment (Appendix 6) as at least 10% of modelled migration flightlines between this SPA and Iceland and Greenland were predicted to pass through the OAA. Designated migratory QI species for each SPA were screened in based on where at least 1% of the Irish population of each species was expected to pass through the OAA each year. This was the case for mallard, teal and wigeon. Less than 1% of the Irish population of coot were considered likely to pass through the OAA each year, therefore this species was screened out of further assessment.

Based on the above, a source-pathway-receptor chain for adverse effects on three QI species of this SPA (mallard, teal and wigeon) has been identified, as a result of potential collision impacts during the Operation and Maintenance phase. These potential impacts are assessed in the following sections.

4.2.4.24.1 *Collision Risk*

Mallard, teal and wigeon

The conservation objectives (COs) for The Gearagh SPA are presented in Table 3-11. Collision impacts are limited to the Operation and Maintenance phase, as turbines will not be operating in the construction or decommissioning phases. It was considered that there was no other source-pathway-receptor chain for adverse effects for the other phases of development therefore the other phases of development are not considered within this assessment.

Population estimates for The Gearagh SPA and the estimated proportion of the SPA population at risk of collision passing through the OAA are shown in Table 4-54. The count year is shown in brackets.

Table 4-54 Population estimates of screened-in species from The Gearagh SPA passing through the OAA and the proportion of birds at risk of collision for each assessed species.

Species	Population estimate	Proportion at risk of collision
Mallard	478 (1996)[a]	0.239
Teal	150 (2005)[b]	0.242
Wigeon	200 (2005)[b]	0.244

[a]*National Parks and Wildlife Service (2012),* [b] *Cronin et al. (2009)*

The results of the mCRM for each screened in species from The Gearagh SPA are presented in Table 4-55.

Table 4-55 Seasonal and annual collision estimates from the OAA for The Gearagh SPA of screened in migratory non-seabird QI species.

Species	Pre-breeding	Post-breeding	Other	Total
Mallard	0.057 ± 0.004	0.057 ± 0.004	0.056 ± 0.004	0.170 ± 0.007
Teal	0.016 ± 0.001	0.016 ± 0.001	0.000 ± 0.000	0.032 ± 0.001
Wigeon	0.022 ± 0.002	0.022 ± 0.002	0.000 ± 0.000	0.044 ± 0.003

The analysis of migration collisions for these qualifying species for The Gearagh SPA show that in all cases, considerably less than a single collision is expected annually. The proportion of these species using this SPA as a staging post or wintering area that are at risk of collision with the Project is extremely small.

On this basis, there will be no adverse effect on the black-tailed godwit, dunlin and shelduck qualifying features of The Gearagh SPA, as defined by the COs for the site as a result of collision effects from the Offshore Site.

In relation to The Gearagh SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.25 Deenish Island and Scariff Island SPA (004175)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of the Deenish Island and Scariff Island SPA which are listed in Table 3-11.

This SPA is of high ornithological importance on account of the internationally important breeding population of storm petrels and nationally important breeding populations of Manx shearwaters, fulmars, lesser black-backed gulls and arctic terns (NPWS, 2024).

Storm petrel has been screened out from further assessment on the basis that this species was only recorded in very low numbers (annual peak count of less than 10 birds) in each year of the site-specific baseline surveys. These infrequently occurring species were considered using expert judgement to be extremely unlikely to use the OAA in numbers large enough to warrant further consideration.

Manx shearwaters have a very large mean maximum foraging range (2,365.5 km) (Woodward *et al.,* 2019) therefore they are not considered to be at risk of displacement or barrier effects (e.g. Bradbury *et al.,* 2014). This species is also not considered to be at risk of collision impacts (e.g. Bradbury *et al.,* 2014) as birds typically fly low to the sea surface. On this basis, there is no adverse effect on this breeding QI species at this SPA.

Similarly, fulmars have a very large mean maximum foraging range of 1,200.2 km (Woodward *et al.,* 2019), therefore fulmars are not considered to be at risk of displacement or barrier effects (e.g. Dierschke *et al.*, 2016). Fulmars are also considered to have a low sensitivity to collisions with OWFs (e.g. Bradbury *et al.,* 2014), as birds typically fly low to the sea surface. On this basis, there is no adverse effect on this breeding QI species at this SPA.

The Offshore Site is outside mean maximum foraging range of breeding Arctic terns from this SPA (Woodward *et al.,* 2019), therefore there is no risk that breeding adults from this SPA will be present in the OAA during the breeding season. It is considered unlikely that individual Arctic terns from this SPA would pass through the OAA on migration, due to the distance between this SPA and the OAA (190.1 km), and that the OAA is to the north of this SPA, with birds migrating to and from their southern wintering grounds. On this basis, there is no adverse effect on this breeding species at this SPA.

As per Table 3-4, a source-pathway-receptor chain for adverse effects on one QI species of this SPA (lesser black-backed gull) has been identified, as a result of potential collision impacts during the Operation and Maintenance phase. These potential impacts are assessed in the following sections.

4.2.4.25.1 Collision Risk

Lesser black-backed gull

The conservation objectives (COs) for lesser black-backed gull at the Deenish Island and Scariff Island SPA are presented in Table 3-11. Collision impacts are limited to the Operation and Maintenance phase, as turbines will not be operating in the construction or decommissioning phases. It was considered that there was no other source-pathway-receptor chain for adverse effects for the other phases of development therefore the other phases of development are not considered within this assessment.

The Deenish Island and Scariff Island SPA population of breeding lesser black-backed gulls in 2000 was 97 pairs (NPWS, 2024), which equates to 194 breeding adults. The breeding population recorded during the Seabirds Count 2015-2021 national census was 168 AON (336 breeding adults) (Appendix 7).

In the breeding season (April to August) the CRM assessment predicted that the mean number of lesser black-backed gull collisions per breeding season would involve 2.8 birds (Appendix 6). However, this includes non-breeding adults and immature birds, as well as breeding adults. As all aged lesser black-backed gulls recorded on baseline surveys in the breeding season were adults, (Appendix 5), it was assumed that 100% of the population present are adult birds, therefore breeding season lesser black-backed gull collision mortality was considered to involve 2.8 adult birds.

A proportion of adult birds present at colonies in the breeding season will opt not to breed in a particular breeding season. It has been estimated that 35% of adult lesser black-backed gulls may be “sabbatical” birds in any particular breeding season (RPS, 2022), and this has been applied for this assessment. On this basis, 0.97 adult lesser black-backed gulls predicted to collide were considered not to be breeding, therefore lesser black-backed gull collision mortality in the breeding season was considered to be 1.83 adult breeding birds (Table 4-56).

In the autumn migration period and winter period of the non-breeding season, zero lesser black-backed collisions were predicted. In the spring migration period of the non-breeding season, the CRM assessment predicted that the mean number of lesser black-backed gull collisions per breeding season would involve 0.4 birds (Appendix 6) (Table 4-56).

Table 4-56 Estimated breeding season collision mortality for lesser black-backed gull from the Deenish Island and Scariff Island SPA

Season	Estimated mortality	Most recent population (birds)	Apportioned colony percentage	Estimated SPA mortality
Breeding (Mar-Aug)	1.83 breeding adults	336	0.1%	0.002 birds
Autumn migration (Sep-Oct)	0 birds	631	0.4%	0 birds

Season	Estimated mortality	Most recent population (birds)	Apportioned colony percentage	Estimated SPA mortality
Winter period (Nov-Feb)	0 birds	631	1.2%	0 birds
Spring migration (Mar)	0.4 birds	631	0.4%	0.002 birds
Total	2.23 birds	-	-	0.004 birds

In the breeding season, apportioning estimated that 0.1% of estimated lesser black-backed gull collision mortality (1.83 breeding adults) would involve breeding lesser black-backed gulls from the Deenish Island and Scariff Island SPA. This equates to 0.002 birds from the SPA per breeding season (1.83x0.001) (Table 4-56).

In the autumn migration period of the non-breeding season, apportioning estimated that 0.4% of estimated lesser black-backed gull collision mortality (zero birds) would involve lesser black-backed gulls from the Deenish Island and Scariff Island SPA. Therefore, estimated SPA mortality was zero birds in the autumn migration period, as no birds were predicted to collide in the autumn migration period (Table 4-56).

In the winter period of the non-breeding season, apportioning estimated that 1.2% of estimated lesser black-backed gull collision mortality (zero birds) would involve lesser black-backed gulls from the Deenish Island and Scariff Island SPA. Therefore, estimated SPA mortality was zero birds in winter period, as no birds were predicted to collide in the winter period (Table 4-56).

In the spring migration period of the non-breeding season, apportioning estimated that 0.4% of estimated lesser black-backed gull collision mortality (0.4 birds) would involve lesser black-backed gulls from the Deenish Island and Scariff Island SPA. This equates to 0.002 birds from the SPA per breeding season (0.4x0.004) (Table 4-56).

Overall, total annual lesser black-backed gull collision mortality (2.23 birds) was predicted to involve 0.004 lesser black-backed gulls from the Deenish Island and Scariff Island SPA (Table 4-56).

The lesser black-backed gull breeding population at the Deenish Island and Scariff Island SPA is estimated to be 336 adult birds (Appendix 7), however there will also be immature birds reared at this SPA that form a component of the SPA population. Applying an immature to adult ratio of 0.876 (Horswill & Robinson, 2015), the total estimated SPA population (adults plus immatures) is 631 birds (Table 4-56). For this assessment the baseline annual mortality was calculated based on an estimated average lesser black-backed gull baseline mortality rate (all ages) of 0.123 (Horswill & Robinson, 2015). Applying this mortality rate, the estimated annual baseline mortality of lesser black-backed gulls at the Deenish Island and Scariff Island SPA is 78 birds (631 x 0.123). The additional annual predicted mortality of 0.004 lesser black-backed gulls would increase the baseline mortality rate by 0.005%.

As highlighted by Natural England guidance, where predicted impacts equate to 1% or below of baseline mortality for a population (e.g. colony population) then this level of impact could be considered non-significant (Parker *et al.,* 2022c). As the predicted increase in annual baseline mortality for lesser black-backed gull was below 1%, PVA was not carried out on the Deenish Island and Scariff Island SPA lesser black-backed gull population, as agreed in the East Coast Phase 1 Method Statement (GoBe, 2022).

On this basis, there will be no adverse effect on the lesser black-backed gull qualifying feature of the Deenish Island and Scariff Island SPA, as defined by the COs for the site as a result of collision effects from the Offshore Site.

In relation to the Deenish Island and Scariff Island SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.26 Clonakilty Bay SPA (004081)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of the Clonakilty Bay SPA which are listed in Table 3-11.

This SPA holds an internationally important population of black-tailed godwits in the non-breeding season, as well as nationally important numbers of shelduck, dunlin and curlew in the non-breeding season. In addition, the wetlands and associated waterbirds within this site are of special conservation interest for Wetland & Waterbirds (NPWS, 2024).

There will be no adverse effects on the Wetlands and Waterfowl QI for this SPA as the Project avoids activity within this SPA.

This SPA was screened in in the migratory CRM assessment (Appendix 10) as at least 10% of modelled migration flightlines between this SPA and Iceland and Greenland were predicted to pass through the OAA. Designated migratory QI species for each SPA were screened in based on where at least 1% of the Irish population of each species was expected to pass through the OAA each year. This was the case for black-tailed godwit, dunlin and shelduck. Less than 1% of the Irish population of curlew were considered likely to pass through the OAA each year, therefore this species was screened out of further assessment.

Based on the above, a source-pathway-receptor chain for adverse effects on three QI species of this SPA (black-tailed godwit, shelduck and dunlin) has been identified, as a result of potential collision impacts during the Operation and Maintenance phase. These potential impacts are assessed in the following sections.

4.2.4.26.1 *Collision Risk*

Black-tailed godwit, shelduck and dunlin

The conservation objectives (COs) for the Clonakilty Bay SPA are presented in Table 3-11. Collision impacts are limited to the Operation and Maintenance phase, as turbines will not be operating in the construction or decommissioning phases. It was considered that there was no other source-pathway-receptor chain for adverse effects for the other phases of development therefore the other phases of development are not considered within this assessment.

Population estimates for the Clonakilty Bay SPA and the estimated proportion of the SPA population at risk of collision passing through the OAA are shown in Table 4-67. The count year is shown in brackets.

Table 4-57 Population estimates of screened-in species from the Clonakilty Bay SPA passing through the OAA and the proportion of birds at risk of collision for each assessed species.

Species	Population estimate	Proportion at risk of collision
Black-tailed Godwit	1,080 (2016)[a]	0.202

Species	Population estimate	Proportion at risk of collision
Dunlin	651 (2016)[a]	0.204
Shelduck	163 (1997)[b]	0.216

[a]Lewis et al. (2019), [b]Crowe (2005)

The results of the mCRM for each screened in species from the Clonakilty Bay SPA are presented in Table 4-58.

Table 4-58 Seasonal and annual collision estimates from the OAA for the Clonakilty Bay SPA of screened in migratory non-seabird QI species.

Species	Pre-breeding	Post-breeding	Other	Total
Black-tailed Godwit	0.007 ± 0.001	0.007 ± 0.001	0.000 ± 0.000	0.014 ± 0.001
Dunlin	0.004 ± 0.000	0.004 ± 0.000	0.000 ± 0.000	0.008 ± 0.000
Shelduck	0.009 ± 0.001	0.009 ± 0.001	0.009 ± 0.001	0.027 ± 0.002

The analysis of migration collisions for these qualifying species for the Clonakilty Bay SPA show that in all cases, considerably less than a single collision is expected annually. The proportion of these species using this SPA as a staging post or wintering area that are at risk of collision with the Project is extremely small.

On this basis, there will be no adverse effect on the black-tailed godwit, dunlin and shelduck qualifying features of the Clonakilty Bay SPA, as defined by the COs for the site as a result of collision effects from the Offshore Site.

In relation to the Clonakilty Bay SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.27 Illanmaster SPA (004074)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of the Illanmaster SPA which are listed in Table 3-11.

This SPA is of ornithological importance because it supports an internationally important breeding population of storm petrels (NPWS, 2024).

Storm petrel has been excluded from further assessment on the basis that this species was only recorded in very low numbers (annual peak count of less than 10 birds) in each year of the site-specific baseline surveys (Appendix 5). These infrequently occurring species were considered using expert judgement to be extremely unlikely to use the OAA in numbers large enough to warrant further consideration.

On this basis, there is no adverse effect on this breeding QI species at this SPA.

In relation to the Illanmaster SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.28 The Bull and The Cow Rocks SPA (004066)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of The Bull and The Cow Rocks SPA which are listed in Table 3-11.

This SPA supports important breeding populations of storm petrels, gannets and puffins (NPWS, 2024).

Storm petrel has been screened out from further assessment on the basis that this species was only recorded in very low numbers (annual peak count of less than 10 birds) in each year of the site-specific baseline surveys. These infrequently occurring species were considered using expert judgement to be extremely unlikely to use the OAA in numbers large enough to warrant further consideration.

As per Table 3-4, a source-pathway-receptor chain for adverse effects on two QI species of this SPA (gannet and puffin) have been identified, as a result of potential collision and displacement impacts during the Operation and Maintenance phase. These potential impacts are assessed in the following sections.

4.2.4.28.1 *Collision Risk*

Gannet

The conservation objectives (COs) for gannet at The Bull and The Cow Rocks SPA are presented in Table 3-11. Collision impacts are limited to the Operation and Maintenance phase, as turbines will not be operating in the construction or decommissioning phases. It was considered that there was no other source-pathway-receptor chain for adverse effects for the other phases of development therefore the other phases of development are not considered within this assessment.

The Bull and The Cow Rocks SPA population of breeding gannets in 2004 was 3,694 pairs (NPWS, 2024), which equates to 7,388 breeding adults. The breeding population recorded in the 2014 national census was 6,388 Apparently Occupied Sites (AOS) (12,776 breeding adults) (Appendix 7).

In the breeding season (March to September), the total mean estimated number of gannet collisions was 0.7 bird (Appendix 6). As this number is very small, it was considered that there was no requirement to take account of non-breeding adults and immature birds, therefore, breeding season gannet collision mortality was considered to involve 0.7 breeding adult birds.

For the autumn and spring migration periods, estimated seasonal gannet mortality from collision was zero birds. Overall, predicted annual gannet mortality due to collision effects involved 0.7 gannets (Appendix 6) (Table 4-60).

Table 4-59 Estimated breeding season collision mortality for gannets from The Bull and The Cow Rocks SPA

Season	Estimated mortality	Most recent population (birds)	Apportioned colony percentage	Estimated SPA mortality
Breeding (Mar-Sep)	0.7	12,776	12.3%	0.09 birds
Autumn migration (Oct-Nov)	0	22,499	3.4%	0 birds

Season	Estimated mortality	Most recent population (birds)	Apportioned colony percentage	Estimated SPA mortality
Spring migration (Dec-Feb)	0	22,499	2.9%	0 birds
Total	0.7	-	-	0.09 birds

In the breeding season, apportioning estimated that 12.3% of estimated gannet collision mortality (0.7 birds) would involve breeding gannets from The Bull and The Cow Rocks SPA. This equates to 0.09 birds from the SPA per breeding season (0.7x0.123) (Table 4-60).

In the autumn migration period of the non-breeding season, apportioning estimated that 3.4% of estimated gannet collision mortality (zero birds) would involve gannets from The Bull and The Cow Rocks SPA. Therefore, estimated SPA mortality was zero birds in the autumn migration period as no gannets were predicted to collide with turbines (Table 4-60).

In the spring migration period of the non-breeding season, apportioning estimated that 2.9% of estimated gannet collision mortality (zero birds) would involve gannets from The Bull and The Cow Rocks SPA. Therefore, estimated SPA mortality was zero birds in the spring migration period as no gannets were predicted to collide with turbines (Table 4-60).

Overall, total annual gannet collision mortality (0.7 birds) was predicted to involve 0.09 gannets from The Bull and The Cow Rocks SPA (Table 4-60).

The gannet breeding population at The Bull and The Cow Rocks SPA is estimated to be 12,776 adult birds (Appendix 7), however there will also be immature birds reared at this SPA that form a component of the SPA population. Applying an immature to adult ratio of 0.761 (Horswill & Robinson, 2015), the total estimated SPA population (adults plus immatures) is 22,499 birds (Table 4-60). For this assessment the baseline annual mortality was calculated based on an estimated average gannet baseline mortality rate (all ages) of 0.181 (Horswill & Robinson, 2015). Applying this mortality rate, the estimated annual baseline mortality of gannets at The Bull and The Cow Rocks SPA is 4,072 birds (22,499 x 0.181). The additional annual predicted mortality of 0.09 gannets would increase the baseline mortality rate by 0.002%.

As highlighted by Natural England guidance, where predicted impacts equate to 1% or below of baseline mortality for a population (e.g. colony population) then this level of impact could be considered non-significant (Parker *et al.,* 2022c). As the predicted increase in annual baseline mortality for gannet was below 1%, PVA was not carried out on The Bull and The Cow Rocks SPA gannet population, as agreed in the East Coast Phase 1 Method Statement (GoBe, 2022).

On this basis, there will be no adverse effect on the gannet qualifying feature of The Bull and The Cow Rocks SPA, as defined by the COs for the site as a result of collision effects from the Offshore Site.

4.2.4.28.2 Displacement

Gannet

The conservation objectives (COs) for gannet at The Bull and The Cow Rocks SPA are presented in Table 3-11. Displacement impacts are limited to the Operation and Maintenance phase, as turbines will not be operating in the construction or decommissioning phases. It was considered that there was no other source-pathway-receptor chain for adverse effects for the other phases of development therefore the other phases of development are not considered within this assessment.

The Bull and The Cow Rocks SPA population of breeding gannets in 2004 was 3,694 pairs (NPWS, 2024), which equates to 7,388 breeding adults. The breeding population recorded in the 2014 national census was 6,388 Apparently Occupied Sites (AOS) (12,776 breeding adults) (Appendix 7).

In the breeding season, based on a displacement rate of 70%, 51 gannets were predicted to be displaced from the OAA and 2 km buffer. However, this includes non-breeding adults and immature birds, as well as breeding adults. In the breeding season (March to September) age was recorded for 85 gannets on baseline surveys, with 34% of birds aged as adults and 66% of birds aged as immature (Appendix 5). Based on this breakdown, it has been assumed that an estimated displacement of 51 gannets would involve 17 adult birds and 34 immature birds.

Due to the low numbers of birds involved, for the purposes of this assessment, it has been assumed that all predicted mortality involved adult breeding gannets, which is considered to be precautionary. Therefore, it was assumed that based on a displacement mortality rate of 1%, displacement mortality was predicted to involve one adult gannet in the breeding season. Based on a mortality rate of 3%, displacement mortality was predicted to involve two adult gannets in the breeding season (Table 4-60).

In the autumn migration period of the non-breeding season, based on a displacement rate of 70%, 50 gannets (all ages) were predicted to be displaced. Applying a mortality rate of 1% would result in a predicted mortality of one gannet. Applying a mortality rate of 3% would result in a predicted mortality of two gannets.

In the spring migration period of the non-breeding season, based on a displacement rate of 70%, four gannets (all ages) were predicted to be displaced. Applying a mortality rate of 1%, the predicted additional mortality due to displacement effects was zero gannets in the spring migration period. Similarly, applying a mortality rate of 3%, the predicted additional mortality due to displacement effects was zero gannets (Table 4-60). Further details and the seasonal displacement matrices are presented in the Displacement Assessment Appendix (Appendix 9).

Table 4-60 Estimated breeding season displacement mortality for gannets from The Bull and The Cow Rocks SPA

Season	Estimated mortality	Most recent population (birds)	Apportioned colony percentage	Estimated SPA mortality
70% displacement and 1% mortality rate				
Breeding (Mar-Sep)	1 adult	12,776	12.3%	0.12 birds
Autumn migration (Oct-Nov)	1 bird	22,499	3.4%	0.03 birds
Spring migration (Dec-Feb)	0 birds	22,499	2.9%	0 birds
Annual total	0	-	-	0.15 birds
70% displacement and 3% mortality rate				
Breeding (Mar-Sep)	2 adults	12,776	12.3%	0.25 birds

Season	Estimated mortality	Most recent population (birds)	Apportioned colony percentage	Estimated SPA mortality
Autumn migration (Oct-Nov)	2 birds	22,499	3.4%	0.07 birds
Spring migration (Dec-Feb)	0 birds	22,499	2.9%	0 birds
Total	4 birds	-	-	0.32

In the breeding season, apportioning estimated that 12.3% of estimated gannet displacement mortality would involve breeding gannets from The Bull and The Cow Rocks SPA. Based on a 70% displacement rate and a 1% mortality rate, this equates to 0.12 birds from the SPA per breeding season (1x0.123). Based on a 70% displacement rate and a 3% mortality rate, this equates to 0.25 birds from the SPA per breeding season (2x0.123) (Table 4-60).

In the autumn migration period of the non-breeding season, apportioning estimated that 3.4% of estimated gannet displacement mortality would involve gannets from The Bull and The Cow Rocks SPA. Based on a 70% displacement rate and a 1% mortality rate, this equates to 0.03 birds from the SPA, in the autumn migration period (1x0.034). Based on a 70% displacement rate and a 3% mortality rate, this equates to 0.07 birds from the SPA, in the spring migration period (2x0.034) (Table 4-60).

In the spring migration period of the non-breeding season, apportioning estimated that 2.9% of estimated gannet displacement mortality would involve gannets from The Bull and The Cow Rocks SPA. This equates to zero birds from the SPA as zero gannets were predicted to be displaced in the spring migration period. Based on a 70% displacement rate and a 3% mortality rate, this also equates to zero birds from the SPA, as zero gannets were predicted to be displaced in the spring migration period (Table 4-60).

Overall, total annual gannet displacement mortality based on a 70% displacement rate and a 1% mortality rate was predicted to involve 0.15 gannets from The Bull and The Cow Rocks SPA. Based on a 70% displacement rate and a 3% mortality rate, annual gannet displacement mortality was predicted to involve 0.32 gannets from The Bull and The Cow Rocks SPA (Table 4-60).

The gannet breeding population at The Bull and The Cow Rocks SPA is estimated to be 12,776 adult birds (Appendix 7), however there will also be immature birds reared at this SPA that form a component of the SPA population. Applying an immature to adult ratio of 0.761 (Horswill & Robinson, 2015), the total estimated SPA population (adults plus immatures) is 22,499 birds (Table 4-60). For this assessment the baseline annual mortality was calculated based on an estimated average gannet baseline mortality rate (all ages) of 0.181 (Horswill & Robinson, 2015). Applying this mortality rate, the estimated annual baseline mortality of gannets at the Skelligs SPA is 4,072 birds (22,499 x 0.181).

Based on a 70% displacement rate and a 1% mortality rate, the additional annual predicted mortality of 0.15 gannets would increase the baseline mortality rate by 0.004%. Based on a 70% displacement rate and a 3% mortality rate, the additional annual predicted mortality of 0.32 gannets would increase the baseline mortality rate by 0.008%.

As highlighted by Natural England guidance, where predicted impacts equate to 1% or below of baseline mortality for a population (e.g. colony population) then this level of impact could be considered non-significant (Parker *et al.,* 2022c). As the predicted increases in annual baseline displacement mortality for gannet were below 1%, PVA was not carried out on The Bull and The Cow Rocks SPA gannet population, as agreed in the East Coast Phase 1 Method Statement (GoBe, 2022).

On this basis, there will be no adverse effect on the gannet qualifying feature of The Bull and The Cow Rocks SPA, as defined by the COs for the site as a result of displacement effects from the Offshore Site.

Puffin

The conservation objectives (COs) for puffin at The Bull and The Cow Rocks SPA are presented in Table 3-11. Displacement impacts are limited to the Operation and Maintenance phase, as turbines will not be operating in the construction or decommissioning phases. It was considered that there was no other source-pathway-receptor chain for adverse effects for the other phases of development therefore the other phases of development are not considered within this assessment.

The Bull and The Cow Rocks SPA population of breeding puffins at the time of designation was 200 AOB (NPWS, 2024), which corresponds to 400 individuals. There was no more recent breeding population data available as there was no count of this site published for the Seabirds Count 2015-2021 national census (Burnell *et al.,*2023), or in Cummins *et al.,* (2019).

As there was no recent population estimate for The Bull and The Cow Rocks SPA at the time of preparation of the Apportioning report (Appendix 7), this SPA was not included in the apportioning assessment for puffin. However, for this assessment, the apportioning weighting for Illanmaster SPA was used as the distances from the colony to the OAA is similar (165.1 km for Illanmaster SPA compared to 192.4 km for The Bull and The Cow Rocks SPA). The population estimates are also similar, with 500 puffins at Illanmaster and 400 puffins at The Bull and The Cow Rocks SPA (NPWS, 2024). Therefore, for this assessment, the population and apportioning weighting for Illanmaster SPA (Appendix 7) was used as a proxy for The Bull and The Cow Rocks SPA.

Based on the mean seasonal peak of puffins in the OAA and 2 km buffer, and a displacement rate of 50% and a mortality rate of 1%, displacement mortality was predicted to be zero birds in the breeding season. Based on a displacement rate of 60%, and a mortality rate of 3%, displacement mortality was predicted to be one puffin in the breeding season, increasing to two puffins, if a mortality rate of 5% was applied (Table 4-61).

For the non-breeding season in the OAA and 2 km buffer, and a displacement rate of 50% and a mortality rate of 1%, displacement mortality was predicted to be zero birds. Based on a displacement rate of 60%, and mortality rates of 1% and 3%, displacement mortality was also predicted to be zero birds (Table 4-61). Further details and the seasonal displacement matrices are presented in the Displacement Assessment Appendix (Appendix 9).

Table 4-61 Estimated breeding season displacement mortality for puffins from The Bull and The Cow Rocks SPA

Season	Estimated mortality	Most recent population (birds) (Illanmaster populations used as a proxy)	Apportioned colony percentage	Estimated SPA mortality
50% displacement and 1% mortality rate				
Breeding (Apr-early Aug)	0	500	1.5%	0 birds
Non-breeding (mid-Aug-Mar)	0	921	0.3%	0 birds

Season	Estimated mortality	Most recent population (birds) (Illanmaster populations used as a proxy)	Apportioned colony percentage	Estimated SPA mortality
Annual total	0	-	-	0 birds
60% displacement and 5% mortality rate in breeding season; 3% in non-breeding season				
Breeding (Apr-early Aug)	2	500	1.5%	0.03 birds
Non-breeding (mid-Aug-Mar)	0	921	0.3%	0 birds
Total	2	-	-	0.03 birds

In the breeding season, apportioning estimated that 1.5% of estimated puffin displacement mortality would involve breeding puffins from The Bull and The Cow Rocks SPA. Based on a 50% displacement rate and a 1% mortality rate, this equates to zero birds from the SPA per breeding season, as zero puffins were predicted to be displaced. Based on a 60% displacement rate and a 5% mortality rate, this equates to 0.03 birds from the SPA per breeding season (2x0.015) (Table 4-61).

In the non-breeding season, apportioning estimated that 0.3% of estimated puffin displacement mortality would involve puffins from The Bull and The Cow Rocks SPA. Based on a 50% displacement rate and a 1% mortality rate, this equates to zero birds from the SPA, as zero puffins were predicted to be displaced in the non-breeding season. Based on a 60% displacement rate and a 5% mortality rate, this also equates to zero birds from the SPA, as zero puffins were predicted to be displaced in the non-breeding season (Table 4-61).

Overall, total annual puffin displacement mortality based on a 50% displacement rate and a 1% mortality rate was predicted to involve zero puffins from The Bull and The Cow Rocks SPA. Based on a 60% displacement rate and a 5% mortality rate in the breeding season and a 3% mortality rate in the non-breeding season, annual puffin displacement mortality was predicted to involve 0.03 puffins from The Bull and The Cow Rocks SPA (Table 4-61).

The puffin breeding population at The Bull and The Cow Rocks SPA is estimated to be 500 adult birds (based on Illanmaster SPA as a proxy - Appendix 7), however there will also be immature birds reared at this SPA that form a component of the SPA population. Applying an immature to adult ratio of 0.842 (Horswill & Robinson, 2015), the total estimated SPA population (adults plus immatures) is 921 birds (Table 4-61). For this assessment the baseline annual mortality was calculated based on an estimated average puffin baseline mortality rate (all ages) of 0.177 (Horswill & Robinson, 2015). Applying this mortality rate, the estimated annual baseline mortality of puffins at The Bull and The Cow Rocks SPA is 163 birds (921 x 0.177).

Based on a 50% displacement rate and a 1% mortality rate, the additional annual predicted displacement mortality of zero puffins would increase the baseline mortality rate by 0%. Based on a 60% displacement rate and a 5% mortality rate in the breeding season and a 3% mortality rate in the non-breeding season, the additional annual predicted displacement mortality of 0.03 puffins would increase the baseline mortality rate by 0.02%.

As highlighted by Natural England guidance, where predicted impacts equate to 1% or below of baseline mortality for a population (e.g. colony population) then this level of impact could be considered non-significant (Parker *et al.,* 2022c). As the predicted increases in annual baseline displacement mortality for puffin were below 1%, PVA was not carried out on The Bull and The Cow Rocks SPA puffin population, as agreed in the East Coast Phase 1 Method Statement (GoBe, 2022).

On this basis, there will be no adverse effect on the puffin qualifying feature of The Bull and The Cow Rocks SPA, as defined by the COs for the site as a result of displacement effects from the Offshore Site.

In relation to The Bull and The Cow Rocks SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.29 Beara Peninsula SPA (004155)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of the Beara Peninsula SPA which are listed in Table 3-11.

This SPA supports an internationally important population of chough, as well as nationally important populations of fulmars and peregrines (NPWS, 2024).

Chough and peregrine are terrestrial species and there is no pathway for these species to be at risk of adverse effects from the Offshore Site, so they are not considered further here.

Fulmars have a mean maximum foraging range of 1,200.2 km (Woodward *et al.,* 2019), therefore there is potential for connectivity for this species between this SPA and the OAA. However, fulmars are not considered to be at risk of displacement or barrier effects (e.g. Dierschke *et al.*, 2016). The species is also considered to have a low sensitivity to collisions with OWFs (e.g. Bradbury *et al.,* 2014), as birds typically fly low to the sea surface. On this basis, there is no adverse effect on this breeding QI species at this SPA.

In relation to the Beara Peninsula SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.30 Aughris Head SPA (004133)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of the Aughris Head SPA which are listed in Table 3-11.

This SPA supports a nationally important breeding population of kittiwakes (NPWS, 2024).

As per Table 3-4, a source-pathway-receptor chain for adverse effects on one QI species of this SPA (kittiwake) has been identified, as a result of potential collision and displacement impacts during the Operation and Maintenance phase. These potential impacts are assessed in the following sections.

4.2.4.30.1 *Collision Risk*

Kittiwake

The conservation objectives (COs) for kittiwake at the Aughris Head SPA are presented in Table 3-11. Collision impacts are limited to the Operation and Maintenance phase, as turbines will not be operating in the construction or decommissioning phases. It was considered that there was no other source-pathway-receptor chain for adverse effects for the other phases of development therefore the other phases of development are not considered within this assessment.

The Aughris Head SPA population of breeding kittiwakes in 1997 was 742 pairs (NPWS, 2024), which equates to 1,484 breeding adults. The breeding population recorded during the Seabirds Count 2015-2021 national census was 527 AON (1,054 breeding adults) (Appendix 7).

In the breeding season (March to August) the CRM assessment predicted that the mean number of kittiwake collisions per breeding season would involve 4.4 birds (Appendix 6). However, this includes non-breeding adults and immature birds, as well as breeding adults. Based on the proportion of immature kittiwakes recorded on baseline surveys in the breeding season (Appendix 5), it was assumed that 91.95% of the population present are adult birds. This would mean that an estimated 4.0 kittiwakes predicted to collide during the breeding season would be adult birds.

Similarly, a proportion of adult birds present at colonies in the breeding season will opt not to breed in a particular breeding season. It has been estimated that 10% of adult kittiwakes may be "sabbatical" birds in any particular breeding season (Xodus, 2023), and this has been applied for this assessment. On this basis, 0.4 adult kittiwakes predicted to collide was considered not to be breeding. Therefore, adult kittiwake mortality in the breeding season was considered to involve 3.6 adult breeding birds and 0.4 non-breeding adults (Table 4-62).

In the autumn migration period of the non-breeding season, the CRM assessment predicted that the mean number of kittiwake collisions would involve 2.8 birds. In the spring migration period of the non-breeding season, the CRM assessment predicted that the mean number of kittiwake collisions would involve 1.0 birds (Table 4-62).

Table 4-62 Estimated breeding season collision mortality for kittiwakes from the Aughris Head SPA

Season	Estimated mortality	Most recent population (birds)	Apportioned colony percentage	Estimated SPA mortality
Breeding (Mar-Aug)	3.6 breeding adults	1,054	0.3%	0.01 birds
Autumn migration	2.8 birds	2,001	0.2%	0.006 birds
Spring migration	1.0 birds	2,001	0.3%	0.003 birds
Total	8.2	-	-	0.02 birds

In the breeding season, apportioning estimated that 0.3% of estimated kittiwake collision mortality (3.6 breeding adults) would involve breeding kittiwakes from the Aughris Head SPA. This equates to 0.01 birds from the SPA per breeding season (3.6x0.003) (Table 4-62).

In the autumn migration period of the non-breeding season, apportioning estimated that 0.2% of estimated kittiwake collision mortality (2.8 birds) would involve kittiwakes from the Aughris Head SPA. Therefore, estimated SPA mortality was 0.006 birds in the autumn migration period (2.8x0.002) (Table 4-62).

In the spring migration period of the non-breeding season, apportioning estimated that 0.3% of estimated kittiwake collision mortality (1.0 birds) would involve kittiwakes from the Aughris Head SPA. This equates to 0.003 birds from the SPA per breeding season (1.0x0.003) (Table 4-62).

Overall, total annual kittiwake collision mortality (8.2 birds) was predicted to involve 0.02 kittiwakes from the Aughris Head SPA (Table 4-62).

The kittiwake breeding population at the Aughris Head SPA is estimated to be 1,054 adult birds (Appendix 7), however there will also be immature birds reared at this SPA that form a component of the SPA population. Applying an immature to adult ratio of 0.898 (Horswill & Robinson, 2015), the total estimated SPA population (adults plus immatures) is 2,001 birds (Table 4-62). For this assessment the baseline annual mortality was calculated based on an estimated average kittiwake baseline mortality rate (all ages) of 0.156 (Horswill & Robinson, 2015). Applying this mortality rate, the estimated annual baseline mortality of kittiwakes at the Aughris Head SPA is 312 birds (2,001 x 0.156). The additional annual predicted mortality of 0.02 kittiwakes would increase the baseline mortality rate by 0.006%.

As highlighted by Natural England guidance, where predicted impacts equate to 1% or below of baseline mortality for a population (e.g. colony population) then this level of impact could be considered non-significant (Parker *et al.,* 2022c). As the predicted increase in annual baseline mortality for kittiwake was below 1%, PVA was not carried out on the Aughris Head SPA kittiwake population, as agreed in the East Coast Phase 1 Method Statement (GoBe, 2022).

On this basis, there will be no adverse effect on the kittiwake qualifying feature of the Aughris Head SPA, as defined by the COs for the site as a result of collision effects from the Offshore Site.

4.2.4.30.2 Displacement

Kittiwake

The conservation objectives (COs) for kittiwake at the Aughris Head SPA are presented in Table 3-11. Displacement impacts are limited to the Operation and Maintenance phase, as turbines will not be operating in the construction or decommissioning phases. It was considered that there was no other source-pathway-receptor chain for adverse effects for the other phases of development therefore the other phases of development are not considered within this assessment.

The Aughris Head SPA population of breeding kittiwakes in 1997 was 742 pairs (NPWS, 2024), which equates to 1,484 breeding adults. The breeding population recorded during the Seabirds Count 2015-2021 national census was 527 AON (1,054 breeding adults) (Appendix 7).

Recent guidance for OWF projects in Scottish waters recommended that a displacement rate of 30% should be used for kittiwakes (NatureScot, 2023), and this displacement rate has been applied for this assessment. NatureScot guidance also recommended that mortality rates of 1% and 3% throughout the year should be used for kittiwake in displacement assessments (NatureScot, 2023). These mortality rates have also been applied for this assessment. Further details of the displacement assessment approach and the seasonal displacement matrices are presented in the Displacement Assessment Appendix (Appendix 9).

Due to the low numbers of birds involved, for the purposes of this assessment, it has been assumed that all predicted mortality involved adult breeding kittiwakes, which is considered to be precautionary, as both adult and immature kittiwakes were recorded in the Offshore Ornithology Study Area on baseline surveys throughout the year (Appendix 5).

In the breeding season, the mean seasonal peak of kittiwakes in the OAA plus 2 km buffer was 93 birds. Based on a displacement rate of 30%, this would mean that an estimated 28 kittiwakes would be displaced from the OAA and 2 km buffer in the breeding season. Applying a 1% mortality rate would therefore involve 0.28 kittiwakes. Applying a 3% mortality rate would involve 0.84 kittiwakes (Table 4-63).

In the autumn migration period of the non-breeding season, the mean seasonal peak of kittiwakes in the OAA plus 2 km buffer was 79 birds. Based on a displacement rate of 30%, this would mean that an estimated 24 kittiwakes would be displaced from the OAA and 2 km buffer in the autumn migration period. Applying a 1% mortality rate would therefore involve 0.24 kittiwakes. Applying a 3% mortality rate would involve 0.72 kittiwakes (Table 4-63).

In the spring migration period of the non-breeding season, the mean seasonal peak of kittiwakes in the OAA plus 2 km buffer was 144 birds. Based on a displacement rate of 30%, this would mean that an estimated 43 kittiwakes would be displaced from the OAA and 2 km buffer in the spring migration period. Applying a 1% mortality rate would therefore involve 0.43 kittiwakes. Applying a 3% mortality rate would involve 1.29 kittiwakes (Table 4-63).

Further details and the seasonal displacement matrices are presented in the Displacement Assessment Appendix (Appendix 9).

Table 4-63 Estimated breeding season displacement mortality for kittiwakes from the Aughris Head SPA

Season	Estimated mortality	Most recent population (birds)	Apportioned colony percentage	Estimated SPA mortality
30% displacement and 1% mortality rate				
Breeding (Mar-Aug)	0.28 birds	1,054	0.3%	0.001 birds
Autumn migration (Sep-Dec)	0.24 birds	2,001	0.2%	0.0005 birds
Spring migration (Jan-Feb)	0.43 birds	2,001	0.3%	0.002 birds
Annual total	0.95 birds	-	-	0.004 birds
30% displacement and 3% mortality rate				
Breeding (Mar-Aug)	0.84 birds	1,054	0.3%	0.003 birds
Autumn migration (Sep-Dec)	0.72 birds	2,001	0.2%	0.001 birds
Spring migration (Jan-Feb)	1.29 birds	2,001	0.3%	0.004 birds
Total	2.85 birds	-	-	0.01 birds

In the breeding season, apportioning estimated that 0.3% of estimated kittiwake displacement mortality would involve breeding kittiwakes from the Aughris Head SPA. Based on a 30% displacement rate and a 1% mortality rate, this equates to 0.001 birds from the SPA per breeding season (0.28x0.003). Based on a 30% displacement rate and a 3% mortality rate, this equates to 0.003 birds from the SPA per breeding season (0.84x0.003) (Table 4-63).

In the autumn migration period of the non-breeding season, apportioning estimated that 0.2% of estimated kittiwake displacement mortality would involve kittiwakes from the Aughris Head SPA.

Based on a 30% displacement rate and a 1% mortality rate, this equates to 0.0005 birds from the SPA per breeding season (0.24x0.002). Based on a 30% displacement rate and a 3% mortality rate, this equates to 0.001 birds from the SPA per breeding season (0.72x0.002) (Table 4-63).

In the spring migration period of the non-breeding season, apportioning estimated that 0.3% of estimated kittiwake displacement mortality would involve kittiwakes from the Aughris Head SPA. Based on a 30% displacement rate and a 1% mortality rate, this equates to 0.002 birds from the SPA per breeding season (0.43x0.003). Based on a 30% displacement rate and a 3% mortality rate, this equates to 0.004 birds from the SPA per breeding season (1.29x0.003) (Table 4-63).

Overall, total annual kittiwake displacement mortality based on a 30% displacement rate and a 1% mortality rate was predicted to involve 0.004 kittiwakes from the Aughris Head SPA. Based on a 30% displacement rate and a 3% mortality rate, annual kittiwake displacement mortality was predicted to involve 0.01 kittiwakes from the Aughris Head SPA (Table 4-63).

The kittiwake breeding population at the Aughris Head SPA is estimated to be 1,054 adult birds (Appendix 7), however there will also be immature birds reared at this SPA that form a component of the SPA population. Applying an immature to adult ratio of 0.898 (Horswill & Robinson, 2015), the total estimated SPA population (adults plus immatures) is 2,001 birds (Table 4-63). For this assessment the baseline annual mortality was calculated based on an estimated average kittiwake baseline mortality rate (all ages) of 0.156 (Horswill & Robinson, 2015). Applying this mortality rate, the estimated annual baseline mortality of kittiwakes at the Aughris Head SPA is 312 birds (2,001 x 0.156).

Based on a 30% displacement rate and a 1% mortality rate, the additional annual predicted mortality of 0.004 kittiwakes would increase the baseline mortality rate by 0.001%. Based on a 30% displacement rate and a 3% mortality rate, the additional annual predicted mortality of 0.01 kittiwakes would increase the baseline mortality rate by 0.003%.

As highlighted by Natural England guidance, where predicted impacts equate to 1% or below of baseline mortality for a population (e.g. colony population) then this level of impact could be considered non-significant (Parker *et al.,* 2022c). As the predicted increases in annual baseline displacement mortality for kittiwake were below 1%, PVA was not carried out on the Aughris Head SPA kittiwake population, as agreed in the East Coast Phase 1 Method Statement (GoBe, 2022).

On this basis, there will be no adverse effect on the kittiwake qualifying feature of the Aughris Head SPA, as defined by the COs for the site as a result of displacement effects from the Offshore Site.

In relation to the Aughris Head SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.31 West Donegal Coast SPA (004150)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of the West Donegal Coast SPA which are listed in Table 3-11.

This SPA supports nationally important breeding populations of fulmars, cormorants, shags, herring gulls, kittiwakes and razorbills, as well as breeding chough and peregrines (NPWS, 2024).

Chough and peregrine are terrestrial species and there is no pathway for these species to be at risk of adverse effects from the Offshore Site, so they are not considered further here.

Fulmars have a very large mean maximum foraging range of 1,200.2 km (Woodward *et al.,* 2019), they are not considered to be at risk of displacement or barrier effects (e.g. Dierschke *et al.*, 2016). Fulmars are also considered to have a low sensitivity to collisions with OWFs (e.g. Bradbury *et al.,* 2014), as birds typically fly low to the sea surface. On this basis, there is no adverse effect on this breeding QI species at this SPA.

The Offshore Site is outside mean maximum foraging range of cormorants, shags, herring gulls and razorbills from this SPA (Woodward *et al.,* 2019), therefore there is no risk that breeding adults of these species from this SPA will be present in the OAA during the breeding season. On this basis, there is no adverse effect on these breeding species at this SPA.

As per Table 3-4, a source-pathway-receptor chain for adverse effects on one QI species of this SPA (kittiwake) has been identified, as a result of potential collision and displacement impacts during the Operation and Maintenance phase. These potential impacts are assessed in the following sections.

4.2.4.31.1 Collision Risk

Kittiwake

The conservation objectives (COs) for kittiwake at the West Donegal Coast SPA are presented in Table 3-11. Collision impacts are limited to the Operation and Maintenance phase, as turbines will not be operating in the construction or decommissioning phases. It was considered that there was no other source-pathway-receptor chain for adverse effects for the other phases of development therefore the other phases of development are not considered within this assessment.

The West Donegal Coast SPA population of breeding kittiwakes in 1999 was 1,037 pairs (NPWS, 2024), which equates to 2,074 breeding adults. The breeding population recorded during the Seabirds Count 2015-2021 national census was 500 AON (1,000 breeding adults) (Appendix 7).

In the breeding season (March to August) the CRM assessment predicted that the mean number of kittiwake collisions per breeding season would involve 4.4 birds (Appendix 6). However, this includes non-breeding adults and immature birds, as well as breeding adults. Based on the proportion of immature kittiwakes recorded on baseline surveys in the breeding season (Appendix 5), it was assumed that 91.95% of the population present are adult birds. This would mean that an estimated 4.0 kittiwakes predicted to collide during the breeding season would be adult birds.

Similarly, a proportion of adult birds present at colonies in the breeding season will opt not to breed in a particular breeding season. It has been estimated that 10% of adult kittiwakes may be “sabbatical” birds in any particular breeding season (Xodus, 2023), and this has been applied for this assessment. On this basis, 0.4 adult kittiwakes predicted to collide was considered not to be breeding. Therefore, adult kittiwake mortality in the breeding season was considered to involve 3.6 adult breeding birds and 0.4 non-breeding adults (Table 4-64).

In the autumn migration period of the non-breeding season, the CRM assessment predicted that the mean number of kittiwake collisions would involve 2.8 birds. In the spring migration period of the non-breeding season, the CRM assessment predicted that the mean number of kittiwake collisions would involve 1.0 birds (Table 4-64).

Table 4-64 Estimated breeding season collision mortality for kittiwakes from the West Donegal Coast SPA

Season	Estimated mortality	Most recent population (birds)	Apportioned colony percentage	Estimated SPA mortality
Breeding (Mar-Aug)	3.6 breeding adults	1,000	0.3%	0.01 birds
Autumn migration	2.8 birds	1,898	0.2%	0.006 birds

Season	Estimated mortality	Most recent population (birds)	Apportioned colony percentage	Estimated SPA mortality
Spring migration	1.0 birds	1,898	0.3%	0.003 birds
Total	8.2	-	-	0.02 birds

In the breeding season, apportioning estimated that 0.3% of estimated kittiwake collision mortality (3.6 breeding adults) would involve breeding kittiwakes from the West Donegal Coast SPA. This equates to 0.01 birds from the SPA per breeding season (3.6x0.003) (Table 4-64).

In the autumn migration period of the non-breeding season, apportioning estimated that 0.2% of estimated kittiwake collision mortality (2.8 birds) would involve kittiwakes from the West Donegal Coast SPA. Therefore, estimated SPA mortality was 0.006 birds in the autumn migration period (2.8x0.002) (Table 4-64).

In the spring migration period of the non-breeding season, apportioning estimated that 0.3% of estimated kittiwake collision mortality (1.0 birds) would involve kittiwakes from the West Donegal Coast SPA. This equates to 0.003 birds from the SPA per breeding season (1.0x0.003) (Table 4-64).

Overall, total annual kittiwake collision mortality (8.2 birds) was predicted to involve 0.02 kittiwakes from the West Donegal Coast SPA (Table 4-64).

The kittiwake breeding population at the West Donegal Coast SPA is estimated to be 1,000 adult birds (Appendix 7), however there will also be immature birds reared at this SPA that form a component of the SPA population. Applying an immature to adult ratio of 0.898 (Horswill & Robinson, 2015), the total estimated SPA population (adults plus immatures) is 1,898 birds (Table 4-64). For this assessment the baseline annual mortality was calculated based on an estimated average kittiwake baseline mortality rate (all ages) of 0.156 (Horswill & Robinson, 2015). Applying this mortality rate, the estimated annual baseline mortality of kittiwakes at the West Donegal Coast SPA is 296 birds (1,898 x 0.156). The additional annual predicted mortality of 0.02 kittiwakes would increase the baseline mortality rate by 0.007%.

As highlighted by Natural England guidance, where predicted impacts equate to 1% or below of baseline mortality for a population (e.g. colony population) then this level of impact could be considered non-significant (Parker *et al.,* 2022c). As the predicted increase in annual baseline mortality for kittiwake was below 1%, PVA was not carried out on the West Donegal Coast SPA kittiwake population, as agreed in the East Coast Phase 1 Method Statement (GoBe, 2022).

On this basis, there will be no adverse effect on the kittiwake qualifying feature of the West Donegal Coast SPA, as defined by the COs for the site as a result of collision effects from the Offshore Site

4.2.4.31.2 Displacement

Kittiwake

The conservation objectives (COs) for kittiwake at the West Donegal Coast SPA are presented in Table 3-11. Displacement impacts are limited to the Operation and Maintenance phase, as turbines will not be operating in the construction or decommissioning phases. It was considered that there was no other source-pathway-receptor chain for adverse effects for the other phases of development therefore the other phases of development are not considered within this assessment.

The West Donegal Coast SPA population of breeding kittiwakes in 1999 was 1,037 pairs (NPWS, 2024), which equates to 2,074 breeding adults. The breeding population recorded during the Seabirds Count 2015-2021 national census was 500 AON (1,000 breeding adults) (Appendix 7).

Recent guidance for OWF projects in Scottish waters recommended that a displacement rate of 30% should be used for kittiwakes (NatureScot, 2023), and this displacement rate has been applied for this assessment. NatureScot guidance also recommended that mortality rates of 1% and 3% throughout the year should be used for kittiwake in displacement assessments (NatureScot, 2023). These mortality rates have also been applied for this assessment. Further details of the displacement assessment approach and the seasonal displacement matrices are presented in the Displacement Assessment Appendix (Appendix 9).

Due to the low numbers of birds involved, for the purposes of this assessment, it has been assumed that all predicted mortality involved adult breeding kittiwakes, which is considered to be precautionary, as both adult and immature kittiwakes were recorded in the Offshore Ornithology Study Area on baseline surveys throughout the year (Appendix 5).

In the breeding season, the mean seasonal peak of kittiwakes in the OAA plus 2 km buffer was 93 birds. Based on a displacement rate of 30%, this would mean that an estimated 28 kittiwakes would be displaced from the OAA and 2 km buffer in the breeding season. Applying a 1% mortality rate would therefore involve 0.28 kittiwakes. Applying a 3% mortality rate would involve 0.84 kittiwakes (Table 4-65).

In the autumn migration period of the non-breeding season, the mean seasonal peak of kittiwakes in the OAA plus 2 km buffer was 79 birds. Based on a displacement rate of 30%, this would mean that an estimated 24 kittiwakes would be displaced from the OAA and 2 km buffer in the autumn migration period. Applying a 1% mortality rate would therefore involve 0.24 kittiwakes. Applying a 3% mortality rate would involve 0.72 kittiwakes (Table 4-65).

In the spring migration period of the non-breeding season, the mean seasonal peak of kittiwakes in the OAA plus 2 km buffer was 144 birds. Based on a displacement rate of 30%, this would mean that an estimated 43 kittiwakes would be displaced from the OAA and 2 km buffer in the spring migration period. Applying a 1% mortality rate would therefore involve 0.43 kittiwakes. Applying a 3% mortality rate would involve 1.29 kittiwakes (Table 4-65).

Further details and the seasonal displacement matrices are presented in the Displacement Assessment Appendix (Appendix 9).

Table 4-65 Estimated breeding season displacement mortality for kittiwakes from the West Donegal Coast SPA

Season	Estimated mortality	Most recent population (birds)	Apportioned colony percentage	Estimated SPA mortality
30% displacement and 1% mortality rate				
Breeding (Mar-Aug)	0.28 birds	1,000	0.3%	0.001 birds
Autumn migration (Sep-Dec)	0.24 birds	1,898	0.2%	0.0005 birds
Spring migration (Jan-Feb)	0.43 birds	1,898	0.3%	0.002 birds

Season	Estimated mortality	Most recent population (birds)	Apportioned colony percentage	Estimated SPA mortality
Annual total	0.95 birds	-	-	0.004 birds
30% displacement and 3% mortality rate				
Breeding (Mar-Aug)	0.84 birds	1,000	0.3%	0.003 birds
Autumn migration (Sep-Dec)	0.72 birds	1,898	0.2%	0.001 birds
Spring migration (Jan-Feb)	1.29 birds	1,898	0.3%	0.004 birds
Total	2.85 birds	-	-	0.01 birds

In the breeding season, apportioning estimated that 0.3% of estimated kittiwake displacement mortality would involve breeding kittiwakes from the West Donegal Coast SPA. Based on a 30% displacement rate and a 1% mortality rate, this equates to 0.001 birds from the SPA per breeding season (0.28x0.003). Based on a 30% displacement rate and a 3% mortality rate, this equates to 0.003 birds from the SPA per breeding season (0.84x0.003) (Table 4-65).

In the autumn migration period of the non-breeding season, apportioning estimated that 0.2% of estimated kittiwake displacement mortality would involve kittiwakes from the West Donegal Coast SPA. Based on a 30% displacement rate and a 1% mortality rate, this equates to 0.0005 birds from the SPA per breeding season (0.24x0.002). Based on a 30% displacement rate and a 3% mortality rate, this equates to 0.001 birds from the SPA per breeding season (0.72x0.002) (Table 4-65).

In the spring migration period of the non-breeding season, apportioning estimated that 0.3% of estimated kittiwake displacement mortality would involve kittiwakes from the West Donegal Coast SPA. Based on a 30% displacement rate and a 1% mortality rate, this equates to 0.002 birds from the SPA per breeding season (0.43x0.003). Based on a 30% displacement rate and a 3% mortality rate, this equates to 0.004 birds from the SPA per breeding season (1.29x0.003) (Table 4-65).

Overall, total annual kittiwake displacement mortality based on a 30% displacement rate and a 1% mortality rate was predicted to involve 0.004 kittiwakes from the West Donegal Coast SPA. Based on a 30% displacement rate and a 3% mortality rate, annual kittiwake displacement mortality was predicted to involve 0.01 kittiwakes from the West Donegal Coast SPA (Table 4-65).

The kittiwake breeding population at the West Donegal Coast SPA is estimated to be 1,000 adult birds (Appendix 7), however there will also be immature birds reared at this SPA that form a component of the SPA population. Applying an immature to adult ratio of 0.898 (Horswill & Robinson, 2015), the total estimated SPA population (adults plus immatures) is 1,898 birds (Table 4-65). For this assessment the baseline annual mortality was calculated based on an estimated average kittiwake baseline mortality rate (all ages) of 0.156 (Horswill & Robinson, 2015). Applying this mortality rate, the estimated annual baseline mortality of kittiwakes at the West Donegal Coast SPA is 296 birds (1,898 x 0.156).

Based on a 30% displacement rate and a 1% mortality rate, the additional annual predicted mortality of 0.004 kittiwakes would increase the baseline mortality rate by 0.001%. Based on a 30% displacement rate and a 3% mortality rate, the additional annual predicted mortality of 0.01 kittiwakes would increase the baseline mortality rate by 0.003%.

As highlighted by Natural England guidance, where predicted impacts equate to 1% or below of baseline mortality for a population (e.g. colony population) then this level of impact could be considered non-significant (Parker *et al.,* 2022c). As the predicted increases in annual baseline displacement mortality for kittiwake were below 1%, PVA was not carried out on the West Donegal Coast SPA kittiwake population, as agreed in the East Coast Phase 1 Method Statement (GoBe, 2022).

On this basis, there will be no adverse effect on the kittiwake qualifying feature of the West Donegal Coast SPA, as defined by the COs for the site as a result of displacement effects from the Offshore Site.

In relation to the West Donegal Coast SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.32 Tory Island SPA (004073)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of the Tory Island SPA which are listed in Table 3-11.

This SPA supports nationally important breeding numbers of fulmars, razorbills and puffins, as well as nationally important numbers of breeding corncrakes (NPWS, 2024).

Corncrakes are terrestrial species and there is no pathway for these species to be at risk of adverse effects from the Offshore Site, so they are not considered further here.

The Offshore Site is outside mean maximum foraging range of breeding razorbills and puffins from this SPA (Woodward *et al.,* 2019), therefore there is no risk that breeding adults of these species from this SPA will be present in the OAA during the breeding season. On this basis, there is no adverse effect on these breeding species at this SPA.

Fulmars have a mean maximum foraging range of 1,200.2 km (Woodward *et al.,* 2019), therefore there is potential for connectivity for this species between this SPA and the OAA. However, fulmars are not considered to be at risk of displacement or barrier effects (e.g. Dierschke *et al.*, 2016). The species is also considered to have a low sensitivity to collisions with OWFs (e.g. Bradbury *et al.,* 2014), as birds typically fly low to the sea surface. On this basis, there is no adverse effect on this breeding QI species at this SPA.

In relation to the Tory Island SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.33 Horn Head to Fanad Head SPA (004194)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of the Horn Head to Fanad Head SPA which are listed in Table 3-11.

This SPA supports an internationally important assemblage of breeding seabirds, including nationally important populations of fulmars, cormorants, shags, kittiwakes, guillemots and razorbills. In addition, the SPA supports nationally important wintering numbers of Greenland white-fronted goose and barnacle goose populations are also of national importance. Chough and peregrine also breed within the SPA (NPWS, 2024).

Chough and peregrine are terrestrial species and there is no pathway for these species to be at risk of adverse effects from the Offshore Site, so they are not considered further here.

The Offshore Site is outside mean maximum foraging range of breeding cormorants, shags, kittiwakes, guillemots and razorbills from this SPA (Woodward *et al.,* 2019), therefore there is no risk that breeding adults of these species from this SPA will be present in the OAA during the breeding season. On this basis, there is no adverse effect on these breeding species at this SPA.

Fulmars have a mean maximum foraging range of 1,200.2 km (Woodward *et al.,* 2019), therefore there is potential for connectivity for this species between this SPA and the OAA. However, fulmars are not considered to be at risk of displacement or barrier effects (e.g. Dierschke *et al.*, 2016). The species is also considered to have a low sensitivity to collisions with OWFs (e.g. Bradbury *et al.,* 2014), as birds typically fly low to the sea surface. On this basis, there is no adverse effect on this breeding QI species at this SPA.

Barnacle goose and Greenland white-fronted goose were screened in in Table 3-1 as being at potential risk of collision if individuals pass through the OAA on spring and autumn migration or during the winter months, when they may be present within this SPA. However, the results from the mCRM concluded that there was no connecting migratory pathway for these species between the SPA and the OAA, as the SPA lies between the OAA and their breeding grounds. These species were therefore considered very unlikely to pass through the OAA on spring and autumn migration, and so any potential collision risk for these species would be negligible (Appendix 10). On this basis, there is no adverse effect on these non-breeding season QI species at this SPA.

In relation to the Horn Head to Fanad Head SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.34 Saltee Islands SPA (004002)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of the Saltee Islands SPA which are listed in Table 3-11.

This SPA supports an internationally important assemblage of over 20,000 breeding seabirds, with nationally important breeding numbers of fulmars, gannets, cormorants, shags, lesser black-backed gulls, herring gulls, kittiwakes, guillemots, razorbills and puffins (NPWS, 2024).

Fulmars have a very large mean maximum foraging range of 1,200.2 km (Woodward *et al.,* 2019), therefore they are not considered to be at risk of displacement or barrier effects (e.g. Dierschke *et al.*, 2016). Fulmars are also considered to have a low sensitivity to collisions with OWFs (e.g. Bradbury *et al.,* 2014), as birds typically fly low to the sea surface. On this basis, there is no adverse effect on this breeding QI species at this SPA.

The Offshore Site is outside mean maximum foraging range of breeding cormorants, shags, lesser black-backed gulls, herring gulls, kittiwakes, guillemots, razorbills and puffins from this SPA (Woodward *et al.,* 2019), therefore there is no risk that breeding adults of these species from this SPA will be present in the OAA during the breeding season. On this basis, there is no adverse effect on these breeding species at this SPA.

As per Table 3-4, a source-pathway-receptor chain for adverse effects on one QI species of this SPA (gannet) has been identified, as a result of potential collision and displacement impacts during the Operation and Maintenance phase. These potential impacts are assessed in the following sections.

4.2.4.34.1 Collision Risk

Gannet

The conservation objectives (COs) for gannet at the Saltee Islands SPA are presented in Table 3-11. Collision impacts are limited to the Operation and Maintenance phase, as turbines will not be operating in the construction or decommissioning phases. It was considered that there was no other source-pathway-receptor chain for adverse effects for the other phases of development therefore the other phases of development are not considered within this assessment.

The Saltee Islands SPA population of breeding gannets in 2004 was 2,446 pairs (NPWS, 2024), which equates to 4,892 breeding adults. The breeding population recorded in the 2014 national census was 4,722 Apparently Occupied Sites (AOS) (9,444 breeding adults) (Appendix 7).

In the breeding season (March to September), the total mean estimated number of gannet collisions was 0.7 bird (Appendix 6). As this number is very small, it was considered that there was no requirement to take account of non-breeding adults and immature birds, therefore, breeding season gannet collision mortality was considered to involve 0.7 breeding adult birds.

For the autumn and spring migration periods, estimated seasonal gannet mortality from collision was zero birds. Overall, predicted annual gannet mortality due to collision effects involved 0.7 gannets (Appendix 6) (Table 4-66).

Table 4-66 Estimated breeding season collision mortality for gannets from the Saltee Islands SPA

Season	Estimated mortality	Most recent population (birds)	Apportioned colony percentage	Estimated SPA mortality
Breeding (Mar-Sep)	0.7	9,444	1.8%	0.01 birds
Autumn migration (Oct-Nov)	0	16,631	2.5%	0 birds
Spring migration (Dec-Feb)	0	16,631	2.2%	0 birds
Total	0.7	-	-	0.01 birds

In the breeding season, apportioning estimated that 1.8% of estimated gannet collision mortality (0.7 birds) would involve breeding gannets from the Saltee Islands SPA. This equates to 0.01 birds from the SPA per breeding season (0.7x0.018) (Table 4-66).

In the autumn migration period of the non-breeding season, apportioning estimated that 2.5% of estimated gannet collision mortality (zero birds) would involve gannets from the Saltee Islands SPA. Therefore, estimated SPA mortality was zero birds in the autumn migration period as no gannets were predicted to collide with turbines (Table 4-66).

In the spring migration period of the non-breeding season, apportioning estimated that 2.2% of estimated gannet collision mortality (zero birds) would involve gannets from the Saltee Islands SPA. Therefore, estimated SPA mortality was zero birds in the spring migration period as no gannets were predicted to collide with turbines (Table 4-66).

Overall, total annual gannet collision mortality (0.7 birds) was predicted to involve 0.01 gannets from the Saltee Islands SPA (Table 4-66).

The gannet breeding population at the Saltee Islands SPA is estimated to be 9,444 adult birds (Appendix 7), however there will also be immature birds reared at this SPA that form a component of the SPA population. Applying an immature to adult ratio of 0.761 (Horswill & Robinson, 2015), the total estimated SPA population (adults plus immatures) is 16,631 birds (Table 4-66). For this assessment the baseline annual mortality was calculated based on an estimated average gannet baseline mortality rate (all ages) of 0.181 (Horswill & Robinson, 2015). Applying this mortality rate, the estimated annual baseline mortality of gannets at the Saltee Islands SPA is 3,010 birds (16,631 x 0.181). The additional annual predicted mortality of 0.01 gannets would increase the baseline mortality rate by 0.0003%.

As highlighted by Natural England guidance, where predicted impacts equate to 1% or below of baseline mortality for a population (e.g. colony population) then this level of impact could be considered non-significant (Parker *et al.,* 2022c). As the predicted increase in annual baseline mortality for gannet was below 1%, PVA was not carried out on the Saltee Islands SPA gannet population, as agreed in the East Coast Phase 1 Method Statement (GoBe, 2022).

On this basis, there will be no adverse effect on the gannet qualifying feature of the Saltee Islands SPA, as defined by the COs for the site as a result of collision effects from the Offshore Site.

4.2.4.34.2 Displacement

Gannet

The conservation objectives (COs) for gannet at the Saltee Islands SPA are presented in Table 3-11. Displacement impacts are limited to the Operation and Maintenance phase, as turbines will not be operating in the construction or decommissioning phases. It was considered that there was no other source-pathway-receptor chain for adverse effects for the other phases of development therefore the other phases of development are not considered within this assessment.

The Saltee Islands SPA population of breeding gannets in 2004 was 2,446 pairs (NPWS, 2024), which equates to 4,892 breeding adults. The breeding population recorded in the 2014 national census was 4,722 Apparently Occupied Sites (AOS) (9,444 breeding adults) (Appendix 7).

In the breeding season, based on a displacement rate of 70%, 51 gannets were predicted to be displaced from the OAA and 2 km buffer. However, this includes non-breeding adults and immature birds, as well as breeding adults. In the breeding season (March to September) age was recorded for 85 gannets on baseline surveys, with 34% of birds aged as adults and 66% of birds aged as immature (Appendix 5). Based on this breakdown, it has been assumed that an estimated displacement of 51 gannets would involve 17 adult birds and 34 immature birds.

Due to the low numbers of birds involved, for the purposes of this assessment, it has been assumed that all predicted mortality involved adult breeding gannets, which is considered to be precautionary. Therefore, it was assumed that based on a displacement mortality rate of 1%, displacement mortality was predicted to involve one adult gannet in the breeding season. Based on a mortality rate of 3%, displacement mortality was predicted to involve two adult gannets in the breeding season (Table 4-67).

In the autumn migration period of the non-breeding season, based on a displacement rate of 70%, 50 gannets (all ages) were predicted to be displaced. Applying a mortality rate of 1% would result in a predicted mortality of one gannet. Applying a mortality rate of 3% would result in a predicted mortality of two gannets.

In the spring migration period of the non-breeding season, based on a displacement rate of 70%, four gannets (all ages) were predicted to be displaced. Applying a mortality rate of 1%, the predicted additional mortality due to displacement effects was zero gannets in the spring migration period.

Similarly, applying a mortality rate of 3%, the predicted additional mortality due to displacement effects was zero gannets (Table 4-67). Further details and the seasonal displacement matrices are presented in the Displacement Assessment Appendix (Appendix 9).

Table 4-67 Estimated breeding season displacement mortality for gannets from the Saltee Islands SPA

Season	Estimated mortality	Most recent population (birds)	Apportioned colony percentage	Estimated SPA mortality
70% displacement and 1% mortality rate				
Breeding (Mar-Sep)	1 adult	9,444	1.8%	0.02 birds
Autumn migration (Oct-Nov)	1 bird	16,631	2.5%	0.025 birds
Spring migration (Dec-Feb)	0 birds	16,631	2.2%	0 birds
Annual total	0	-	-	0.05 birds
70% displacement and 3% mortality rate				
Breeding (Mar-Sep)	2 adults	9,444	1.8%	0.04 birds
Autumn migration (Oct-Nov)	2 birds	16,631	2.5%	0.05 birds
Spring migration (Dec-Feb)	0 birds	16,631	2.2%	0 birds
Total	4 birds	-	-	0.09 birds

In the breeding season, apportioning estimated that 1.8% of estimated gannet displacement mortality would involve breeding gannets from the Saltee Islands SPA. Based on a 70% displacement rate and a 1% mortality rate, this equates to 0.02 birds from the SPA per breeding season (1x0.018). Based on a 70% displacement rate and a 3% mortality rate, this equates to 0.04 birds from the SPA per breeding season (2x0.018) (Table 4-67).

In the autumn migration period of the non-breeding season, apportioning estimated that 2.5% of estimated gannet displacement mortality would involve gannets from the Saltee Islands SPA. Based on a 70% displacement rate and a 1% mortality rate, this equates to 0.03 birds from the SPA, in the autumn migration period (1x0.025). Based on a 70% displacement rate and a 3% mortality rate, this equates to 0.05 birds from the SPA, in the spring migration period (2x0.025) (Table 4-67).

In the spring migration period of the non-breeding season, apportioning estimated that 2.2% of estimated gannet displacement mortality would involve gannets from the Saltee Islands SPA. This equates to zero birds from the SPA as zero gannets were predicted to be displaced in the spring migration period. Based on a 70% displacement rate and a 3% mortality rate, this also equates to zero birds from the SPA, as zero gannets were predicted to be displaced in the spring migration period (Table 4-67).

Overall, total annual gannet displacement mortality based on a 70% displacement rate and a 1% mortality rate was predicted to involve 0.05 gannets from the Saltee Islands SPA. Based on a 70% displacement rate and a 3% mortality rate, annual gannet displacement mortality was predicted to involve 0.09 gannets from the Saltee Islands SPA (Table 4-67).

The gannet breeding population at the Saltee Islands SPA is estimated to be 9,444 adult birds (Appendix 7), however there will also be immature birds reared at this SPA that form a component of the SPA population. Applying an immature to adult ratio of 0.761 (Horswill & Robinson, 2015), the total estimated SPA population (adults plus immatures) is 16,631 birds (Table 4-67). For this assessment the baseline annual mortality was calculated based on an estimated average gannet baseline mortality rate (all ages) of 0.181 (Horswill & Robinson, 2015). Applying this mortality rate, the estimated annual baseline mortality of gannets at the Saltee Islands SPA is 3,010 birds (16,631 x 0.181).

Based on a 70% displacement rate and a 1% mortality rate, the additional annual predicted mortality of 0.05 gannets would increase the baseline mortality rate by 0.002%. Based on a 70% displacement rate and a 3% mortality rate, the additional annual predicted mortality of 0.09 gannets would increase the baseline mortality rate by 0.003%.

As highlighted by Natural England guidance, where predicted impacts equate to 1% or below of baseline mortality for a population (e.g. colony population) then this level of impact could be considered non-significant (Parker *et al.,* 2022c). As the predicted increases in annual baseline displacement mortality for gannet were below 1%, PVA was not carried out on the Saltee Islands SPA gannet population, as agreed in the East Coast Phase 1 Method Statement (GoBe, 2022).

On this basis, there will be no adverse effect on the gannet qualifying feature of the Saltee Islands SPA, as defined by the COs for the site as a result of displacement effects from the Offshore Site.

In relation to the Saltee Islands SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.35 Mingulay and Berneray SPA (UK9001121)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of the Mingulay and Berneray SPA which are listed in Table 3-11.

This SPA supports breeding numbers of fulmars, guillemot, kittiwake and puffin, as well as an internationally important assemblage of over 20,000 breeding seabirds (JNCC, 2024).

The Offshore Site lies outside the mean maximum foraging range of breeding kittiwakes, guillemots, and puffins from this SPA (Woodward *et al.,* 2019), therefore there is no risk that breeding adults of these species from this SPA will be present in the OAA during the breeding season. On this basis, there is no adverse effect on these breeding species at this SPA.

Fulmars have a mean maximum foraging range of 1,200.2 km (Woodward *et al.,* 2019), therefore there is potential for connectivity for this species between this SPA and the OAA. However, fulmars are not considered to be at risk of displacement or barrier effects (e.g. Dierschke *et al.*, 2016). The species is also considered to have a low sensitivity to collisions with OWFs (e.g. Bradbury *et al.,* 2014), as birds typically fly low to the sea surface. On this basis, there is no adverse effect on this breeding QI species at this SPA.

In relation to the Mingulay and Berneray SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.36 Skomer, Skokholm and the Seas off Pembrokeshire / Sgomer, Sgogwm a Moroedd Penfro SPA (UK9014051)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of the Skomer, Skokholm and the Seas off Pembrokeshire / Sgomer, Sgogwm a Moroedd Penfro SPA which are listed in Table 3-11.

This SPA is classified for the protection of breeding storm petrels, Manx shearwaters, lesser black-backed gulls and puffins, as well as an internationally important assemblage of over 20,000 breeding seabirds. In addition, chough and short-eared owl also are QIs for this SPA (JNCC, 2024).

Chough and short-eared owl are terrestrial species and there is no pathway for these species from this SPA to be at risk of adverse effects from the Offshore Site, so they are not considered further here.

Storm petrel has been excluded from further assessment on the basis that this species was only recorded in very low numbers (annual peak count of less than 10 birds) in each year of the site-specific baseline surveys (Appendix 5). These infrequently occurring species were considered using expert judgement to be extremely unlikely to use the OAA in numbers large enough to warrant further consideration.

The Offshore Site is outside mean maximum foraging range of breeding lesser black-backed gulls and puffins from this SPA (Woodward *et al.,* 2019), therefore there is no risk that breeding adults of these species from this SPA will be present in the OAA during the breeding season. On this basis, there is no adverse effect on these breeding species at this SPA.

Manx shearwaters have a very large mean maximum foraging range (2,365.5 km) (Woodward *et al.,* 2019) and are therefore not considered to be at risk of displacement or barrier effects (e.g. Bradbury *et al.,* 2014). This species is also not considered to be at risk of collision impacts (e.g. Bradbury *et al.,* 2014) as birds typically fly low to the sea surface. On this basis, there is no adverse effect on this breeding QI species at this SPA.

In relation to the Skomer, Skokholm and the Seas off Pembrokeshire / Sgomer, Sgogwm a Moroedd Penfro SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.37 Rum SPA (UK9001341)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of the Rum SPA which are listed in Table 3-11.

This SPA is classified for the protection of breeding guillemots, kittiwakes and Manx shearwaters, as well as an internationally important assemblage of over 20,000 breeding seabirds. In addition, breeding golden eagles are listed as a QI for this SPA (JNCC, 2024).

Golden eagle is a terrestrial species and there is no pathway for this species from this SPA to be at risk of adverse effects from the Offshore Site, so it is not considered further here.

The Offshore Site is outside mean maximum foraging range of breeding guillemots and kittiwakes from this SPA (Woodward *et al.,* 2019), therefore there is no risk that breeding adults of these species from this SPA will be present in the OAA during the breeding season. On this basis, there is no adverse effect on these breeding species at this SPA.

Manx shearwaters have a very large mean maximum foraging range (2,365.5 km) (Woodward *et al.,* 2019) and are therefore not considered to be at risk of displacement or barrier effects (e.g. Bradbury *et al.,* 2014). This species is also not considered to be at risk of collision impacts (e.g. Bradbury *et al.,* 2014) as birds typically fly low to the sea surface. On this basis, there is no adverse effect on this breeding QI species at this SPA.

In relation to the Rum SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.38 Seas off St Kilda SPA (UK9020332)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of the Seas off St Kilda SPA which are listed in Table 3-11.

This SPA is classified for the protection of breeding fulmars, gannets, great skuas and guillemots (JNCC, 2024).

Great skua has been screened out from further assessment on the basis that this species was not recorded in the OAA during the site-specific baseline surveys. Where seabird species were not recorded in the OAA over the duration of site-specific baseline surveys (24 months), it is considered objectively reasonable using expert judgement to exclude them from further assessment. Seabird species that were not recorded in the OAA on baseline surveys were considered extremely unlikely to use the OAA in numbers large enough to warrant further consideration.

The Offshore Site is outside mean maximum foraging range of breeding gannets, guillemots from this SPA (Woodward *et al.,* 2019), therefore there is no risk that breeding adults of these species from this SPA will be present in the OAA during the breeding season. On this basis, there is no adverse effect on these breeding species at this SPA.

Fulmars have a mean maximum foraging range of 1,200.2 km (Woodward *et al.,* 2019), therefore there is potential for connectivity for this species between this SPA and the OAA. However, fulmars are not considered to be at risk of displacement or barrier effects (e.g. Dierschke *et al.*, 2016). The species is also considered to have a low sensitivity to collisions with OWFs (e.g. Bradbury *et al.,* 2014), as birds typically fly low to the sea surface. On this basis, there is no adverse effect on this breeding QI species at this SPA.

In relation to the Seas off St Kilda SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.39 St Kilda SPA (UK9001031)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of the St Kilda SPA which are listed in Table 3-11.

This SPA is classified for the protection of breeding fulmars, gannets, storm petrels, Leach's petrels, Manx shearwaters, kittiwakes, great skuas, guillemots, razorbills and puffins, as well as an internationally important assemblage of over 20,000 breeding seabirds (JNCC, 2024).

Leach's petrel and great skua have been excluded from further assessment on the basis that this species was not recorded within the OAA on baseline surveys (Appendix 5). Where seabird species were not recorded in the OAA over the duration of site-specific baseline surveys (24 months), it is considered objectively reasonable using expert judgement to exclude them from further assessment. Seabird species that were not recorded in the OAA on baseline surveys were considered extremely unlikely to use the OAA in numbers large enough to warrant further consideration.

Storm petrel has been excluded from further assessment on the basis that this species was only recorded in very low numbers (annual peak count of less than 10 birds) in each year of the site-specific baseline surveys (Appendix 5). These infrequently occurring species were considered using expert judgement to be extremely unlikely to use the OAA in numbers large enough to warrant further consideration.

On this basis, there is no adverse effect on these breeding QI species at this SPA.

The Offshore Site is outside mean maximum foraging range of breeding kittiwakes, guillemots, razorbills and puffins from this SPA (Woodward *et al.,* 2019), therefore there is no risk that breeding adults of these species from this SPA will be present in the OAA during the breeding season. On this basis, there is no adverse effect on these breeding species at this SPA.

Fulmars have a mean maximum foraging range of 1,200.2 km (Woodward *et al.,* 2019), therefore there is potential for connectivity for this species between this SPA and the OAA. However, fulmars are not considered to be at risk of displacement or barrier effects (e.g. Dierschke *et al.*, 2016). The species is also considered to have a low sensitivity to collisions with OWFs (e.g. Bradbury *et al.,* 2014), as birds typically fly low to the sea surface. On this basis, there is no adverse effect on this breeding QI species at this SPA.

Manx shearwaters have a very large mean maximum foraging range (2,366 km) (Woodward *et al.,* 2019) and are therefore not considered to be at risk of displacement or barrier effects (e.g. Bradbury *et al.,* 2014). This species is also not considered to be at risk of collision impacts (e.g. Bradbury *et al.,* 2014) as birds typically fly low to the sea surface. On this basis, there is no adverse effect on this breeding QI species at this SPA.

In relation to the St Kilda SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.40 Copeland Islands SPA (UK9020291)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of the Copeland Islands SPA which are listed in Table 3-11.

This SPA is classified for the protection of breeding Manx shearwaters and Arctic terns (JNCC, 2024).

The Offshore Site is outside mean maximum foraging range of breeding Arctic terns from this SPA (Woodward *et al.,* 2019), therefore there is no risk that breeding adults from this SPA will be present in the OAA during the breeding season. On this basis, there is no adverse effect on this breeding species at this SPA.

Manx shearwaters have a very large mean maximum foraging range (2,366 km) (Woodward *et al.,* 2019) and are therefore not considered to be at risk of displacement or barrier effects (e.g. Bradbury *et al.,* 2014). This species is also not considered to be at risk of collision impacts (e.g. Bradbury *et al.,* 2014) as birds typically fly low to the sea surface. On this basis, there is no adverse effect on this breeding QI species at this SPA.

In relation to the Copeland Islands SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.41 Glannau Aberdaron ac Ynys Enlli/ Aberdaron Coast and Bardsey Island SPA (UK9013121)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of the Glannau Aberdaron ac Ynys Enlli/ Aberdaron Coast and Bardsey Island SPA which are listed in Table 3-11.

This SPA is classified for the protection of breeding Manx shearwaters and chough (JNCC, 2024).

Chough is a terrestrial species and there is no pathway for this species from this SPA to be at risk of adverse effects from the Offshore Site, so it is not considered further here.

Manx shearwaters have a very large mean maximum foraging range (2,366 km) (Woodward *et al.,* 2019) and are therefore not considered to be at risk of displacement or barrier effects (e.g. Bradbury *et al.,* 2014). This species is also not considered to be at risk of collision impacts (e.g. Bradbury *et al.,* 2014) as birds typically fly low to the sea surface. On this basis, there is no adverse effect on this breeding QI species at this SPA.

In relation to the Glannau Aberdaron ac Ynys Enlli/ Aberdaron Coast and Bardsey Island SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.42 Shiant Isles SPA (UK9001041)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of the Shiant Islands SPA which are listed in Table 3-11.

This SPA is classified for the protection of breeding fulmars, shags, kittiwakes, guillemots, razorbills and puffins, as well as an internationally important assemblage of over 20,000 breeding seabirds. In addition, wintering barnacle geese are also a QI species for this SPA (JNCC, 2024).

The Offshore Site is outside mean maximum foraging range of breeding shags, kittiwakes, guillemots, razorbills and puffins from this SPA (Woodward *et al.,* 2019), therefore there is no risk that breeding adults of these species from this SPA will be present in the OAA during the breeding season. On this basis, there is no adverse effect on these breeding species at this SPA.

Wintering barnacle geese at this SPA are not considered likely to pass through the OAA on migration based on the distance from the OAA and the location of this SPA, therefore there is no adverse effect on this species at this SPA.

Fulmars have a mean maximum foraging range of 1,200.2 km (Woodward *et al.,* 2019), therefore there is potential for connectivity for this species between this SPA and the OAA. However, fulmars are not considered to be at risk of displacement or barrier effects (e.g. Dierschke *et al.*, 2016). The species is also considered to have a low sensitivity to collisions with OWFs (e.g. Bradbury *et al.,* 2014), as birds typically fly low to the sea surface. On this basis, there is no adverse effect on this breeding QI species at this SPA.

In relation to the Shiant Islands SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.43 Flannan Isles SPA (UK9001021)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of the Flannan Isles SPA which are listed in Table 3-11.

This SPA is classified for the protection of breeding fulmars, Leach's petrels, kittiwakes, guillemots, razorbills and puffins, as well as an internationally important assemblage of over 20,000 breeding seabirds (JNCC, 2024).

Leach's petrel has been excluded from further assessment on the basis that this species was not recorded within the OAA on baseline surveys (Appendix 5). Where seabird species were not recorded in the OAA over the duration of site-specific baseline surveys (24 months), it is considered objectively reasonable using expert judgement to exclude them from further assessment. Seabird species that were not recorded in the OAA on baseline surveys were considered extremely unlikely to use the OAA in numbers large enough to warrant further consideration.

The Offshore Site is outside mean maximum foraging range of breeding kittiwakes, guillemots, razorbills and puffins from this SPA (Woodward *et al.,* 2019), therefore there is no risk that breeding adults of these species from this SPA will be present in the OAA during the breeding season. On this basis, there is no adverse effect on these breeding species at this SPA.

Fulmars have a mean maximum foraging range of 1,200.2 km (Woodward *et al.,* 2019), therefore there is potential for connectivity for this species between this SPA and the OAA. However, fulmars are not considered to be at risk of displacement or barrier effects (e.g. Dierschke *et al.*, 2016). The species is also considered to have a low sensitivity to collisions with OWFs (e.g. Bradbury *et al.,* 2014), as birds typically fly low to the sea surface. On this basis, there is no adverse effect on this breeding QI species at this SPA.

In relation to the Flannan Isles SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.44 Lambay Island SPA (004069)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of the Lambay Island SPA which are listed in Table 3-11.

This SPA supports nine breeding seabird species (fulmar, cormorant, shag, lesser black-backed gull, herring gull, kittiwake, guillemot, razorbill and puffin). In addition, this SPA also supports a nationally important wintering population of greylag goose (NPWS, 2024).

The Offshore Site is outside mean maximum foraging range of breeding cormorants, shags, lesser black-backed gulls, herring gulls, kittiwakes, guillemots, razorbills and puffins from this SPA (Woodward *et al.,* 2019), therefore there is no risk that breeding adults of these species from this SPA will be present in the OAA during the breeding season. On this basis, there is no adverse effect on these breeding species at this SPA.

Wintering greylag geese at this SPA are not considered likely to pass through the OAA on migration based on the location of this SPA in relation to the OAA, therefore there is no adverse effect on this species at this SPA.

Fulmars have a mean maximum foraging range of 1,200.2 km (Woodward *et al.,* 2019), therefore there is potential for connectivity for this species between this SPA and the OAA. However, fulmars are not considered to be at risk of displacement or barrier effects (e.g. Dierschke *et al.*, 2016). The species is also considered to have a low sensitivity to collisions with OWFs (e.g. Bradbury *et al.,* 2014), as birds typically fly low to the sea surface. On this basis, there is no adverse effect on this breeding QI species at this SPA.

In relation to the Lambay Island SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.45 Ouessant-Molène SPA (France)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of the Ouessant-Molène SPA which are listed in Table 3-11.

This SPA supports breeding populations of fulmars and Manx shearwaters. In addition, a number of other seabirds breed at this SPA however these species are beyond mean maximum foraging range of the Offshore Site, therefore there is no adverse effect on these species at this SPA.

Fulmars have a mean maximum foraging range of 1,200.2 km (Woodward *et al.,* 2019), therefore there is potential for connectivity for this species between this SPA and the OAA. However, fulmars are not considered to be at risk of displacement or barrier effects (e.g. Dierschke *et al.*, 2016). The species is also considered to have a low sensitivity to collisions with OWFs (e.g. Bradbury *et al.,* 2014), as birds typically fly low to the sea surface. On this basis, there is no adverse effect on this breeding QI species at this SPA.

Manx shearwaters have a very large mean maximum foraging range (2,366 km) (Woodward *et al.,* 2019) and are therefore not considered to be at risk of displacement or barrier effects (e.g. Bradbury *et al.,* 2014). This species is also not considered to be at risk of collision impacts (e.g. Bradbury *et al.,* 2014) as birds typically fly low to the sea surface. On this basis, there is no adverse effect on this breeding QI species at this SPA.

In relation to the Ouessant-Molène SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.46 Handa SPA (UK9001241)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of the Handa SPA which are listed in Table 3-11.

This SPA is classified for the protection of breeding fulmars, great skuas, kittiwakes, guillemots and razorbills, as well as an internationally important assemblage of over 20,000 breeding seabirds (JNCC, 2024).

Great skua has been screened out from further assessment on the basis that this species was not recorded in the OAA during the site-specific baseline surveys. Where seabird species were not recorded in the OAA over the duration of site-specific baseline surveys (24 months), it is considered objectively reasonable using expert judgement to exclude them from further assessment. Seabird species that were not recorded in the OAA on baseline surveys were considered extremely unlikely to use the OAA in numbers large enough to warrant further consideration.

The Offshore Site is outside mean maximum foraging range of breeding kittiwakes, guillemots and razorbills from this SPA (Woodward *et al.,* 2019), therefore there is no risk that breeding adults of these species from this SPA will be present in the OAA during the breeding season. On this basis, there is no adverse effect on these breeding species at this SPA.

Fulmars have a mean maximum foraging range of 1,200.2 km (Woodward *et al.,* 2019), therefore there is potential for connectivity for this species between this SPA and the OAA. However, fulmars are not considered to be at risk of displacement or barrier effects (e.g. Dierschke *et al*., 2016). The species is also considered to have a low sensitivity to collisions with OWFs (e.g. Bradbury *et al.,* 2014), as birds typically fly low to the sea surface. On this basis, there is no adverse effect on this breeding QI species at this SPA.

In relation to the Handa SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.47 Cape Wrath SPA (UK9001231)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of the Cape Wrath SPA which are listed in Table 3-11.

This SPA is classified for the protection of breeding fulmars, kittiwakes, guillemots, razorbills and puffins, as well as an internationally important assemblage of over 20,000 breeding seabirds (JNCC, 2024).

The Offshore Site is outside mean maximum foraging range of breeding kittiwakes, guillemots, razorbills and puffins from this SPA (Woodward *et al.,* 2019), therefore there is no risk that breeding adults of these species from this SPA will be present in the OAA during the breeding season. On this basis, there is no adverse effect on these breeding species at this SPA.

Fulmars have a mean maximum foraging range of 1,200 km (Woodward *et al.,* 2019), therefore there is potential for connectivity for this species between this SPA and the OAA. However, fulmars are not considered to be at risk of displacement or barrier effects (e.g. Dierschke *et al*., 2016). The species is also considered to have a low sensitivity to collisions with OWFs (e.g. Bradbury *et al.,* 2014), as birds typically fly low to the sea surface. On this basis, there is no adverse effect on this breeding QI species at this SPA.

In relation to the Cape Wrath SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.48 Cote de Granit Rose-Sept Iles SPA (France)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of the Cote de Granit Rose-Sept Iles SPA which are listed in Table 3-11.

This SPA supports breeding populations of fulmars and Manx shearwaters. In addition, a number of other seabirds breed at this SPA however these species are beyond mean maximum foraging range of the Offshore Site, therefore there is no adverse effect on these species at this SPA.

Fulmars have a mean maximum foraging range of 1,200.2 km (Woodward *et al.,* 2019), therefore there is potential for connectivity for this species between this SPA and the OAA. However, fulmars are not considered to be at risk of displacement or barrier effects (e.g. Dierschke *et al.*, 2016). The species is also considered to have a low sensitivity to collisions with OWFs (e.g. Bradbury *et al.,* 2014), as birds typically fly low to the sea surface. On this basis, there is no adverse effect on this breeding QI species at this SPA.

Manx shearwaters have a very large mean maximum foraging range (2,366 km) (Woodward *et al.,* 2019) and are therefore not considered to be at risk of displacement or barrier effects (e.g. Bradbury *et al.,* 2014). This species is also not considered to be at risk of collision impacts (e.g. Bradbury *et al.,* 2014) as birds typically fly low to the sea surface. On this basis, there is no adverse effect on this breeding QI species at this SPA.

In relation to the Cote de Granit Rose-Sept Iles SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.49 Camaret SPA (France)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of the Camaret SPA which are listed in Table 3-11.

This SPA supports breeding populations of fulmars. In addition, a number of other seabirds breed at this SPA however these species are beyond mean maximum foraging range of the Offshore Site, therefore there is no adverse effect on these species at this SPA.

Fulmars have a mean maximum foraging range of 1,200.2 km (Woodward *et al.,* 2019), therefore there is potential for connectivity for this species between this SPA and the OAA. However, fulmars are not considered to be at risk of displacement or barrier effects (e.g. Dierschke *et al.*, 2016). The species is also considered to have a low sensitivity to collisions with OWFs (e.g. Bradbury *et al.,* 2014), as birds typically fly low to the sea surface. On this basis, there is no adverse effect on this breeding QI species at this SPA.

In relation to the Camaret SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.50 North Rona and Sula Sgeir SPA (UK9001011)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of the North Rona and Sula Sgeir SPA which are listed in Table 3-11.

This SPA is classified for the protection of breeding fulmars, storm petrels, Leach's petrels, gannets, great black-backed gulls, kittiwakes, guillemots, razorbills and puffins, as well as an internationally important assemblage of over 20,000 breeding seabirds (JNCC, 2024).

Leach's petrel has been excluded from further assessment on the basis that this species was not recorded within the OAA on baseline surveys (Appendix 5). Where seabird species were not recorded in the OAA over the duration of site-specific baseline surveys (24 months), it is considered objectively reasonable using expert judgement to exclude them from further assessment. Seabird species that were not recorded in the OAA on baseline surveys were considered extremely unlikely to use the OAA in numbers large enough to warrant further consideration.

Storm petrel has been excluded from further assessment on the basis that this species was only recorded in very low numbers (annual peak count of less than 10 birds) in each year of the site-specific baseline surveys (Appendix 5). These infrequently occurring species were considered using expert judgement to be extremely unlikely to use the OAA in numbers large enough to warrant further consideration.

On this basis, there is no adverse effect on these breeding QI species at this SPA.

The Offshore Site is outside mean maximum foraging range of gannets, great black-backed gulls, kittiwakes, guillemots, razorbills and puffins from this SPA (Woodward *et al.,* 2019), therefore there is no risk that breeding adults of these species from this SPA will be present in the OAA during the breeding season. On this basis, there is no adverse effect on these breeding species at this SPA.

Fulmars have a mean maximum foraging range of 1,200.2 km (Woodward *et al.,* 2019), therefore there is potential for connectivity for this species between this SPA and the OAA. However, fulmars are not considered to be at risk of displacement or barrier effects (e.g. Dierschke *et al.*, 2016). The species is also considered to have a low sensitivity to collisions with OWFs (e.g. Bradbury *et al.,* 2014), as birds typically fly low to the sea surface. On this basis, there is no adverse effect on this breeding QI species at this SPA.

In relation to the North Rona and Sula Sgeir SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.51 North Caithness Cliffs SPA (UK9001181)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of the North Caithness Cliffs SPA which are listed in Table 3-11.

This SPA is classified for the protection of breeding fulmars, kittiwakes, guillemots, razorbills and puffins, as well as an internationally important assemblage of over 20,000 breeding seabirds. In addition, peregrine is also listed as a QI for this SPA (JNCC, 2024).

Peregrine is a terrestrial species and there is no pathway for this species from this SPA to be at risk of adverse effects from the Offshore Site, so it is not considered further here.

The Offshore Site is outside mean maximum foraging range of breeding kittiwakes, guillemots, razorbills and puffins from this SPA (Woodward *et al.,* 2019), therefore there is no risk that breeding adults of these species from this SPA will be present in the OAA during the breeding season. On this basis, there is no adverse effect on these breeding species at this SPA.

Fulmars have a mean maximum foraging range of 1,200.2 km (Woodward *et al.,* 2019), therefore there is potential for connectivity for this species between this SPA and the OAA. However, fulmars are not considered to be at risk of displacement or barrier effects (e.g. Dierschke *et al.*, 2016). The species is also considered to have a low sensitivity to collisions with OWFs (e.g. Bradbury *et al.,* 2014), as birds typically fly low to the sea surface. On this basis, there is no adverse effect on this breeding QI species at this SPA .

In relation to the North Caithness Cliffs SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.52 Hoy SPA (UK9002141)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of the Hoy SPA which are listed in Table 3-11.

This SPA is classified for the protection of breeding red-throated divers, fulmars, great skuas, great black-backed gulls, Arctic skuas, kittiwakes, guillemots and puffins, as well as an internationally important assemblage of over 20,000 breeding seabirds. In addition, peregrine is also listed as a QI for this SPA (JNCC, 2024).

Peregrine is a terrestrial species and there is no pathway for this species from this SPA to be at risk of adverse effects from the Offshore Site, so it is not considered further here.

Red-throated diver, great skua and Arctic skua have been excluded from further assessment on the basis that these species were not recorded within the OAA on baseline surveys (Appendix 5). Where seabird species were not recorded in the OAA over the duration of site-specific baseline surveys (24 months), it is considered objectively reasonable using expert judgement to exclude them from further assessment. Seabird species that were not recorded in the OAA on baseline surveys were considered extremely unlikely to use the OAA in numbers large enough to warrant further consideration.

The Offshore Site is outside mean maximum foraging range of breeding great black-backed gulls, kittiwakes, guillemots, razorbills and puffins from this SPA (Woodward *et al.,* 2019), therefore there is no risk that breeding adults of these species from this SPA will be present in the OAA during the breeding season. On this basis, there is no adverse effect on these breeding species at this SPA.

Fulmars have a mean maximum foraging range of 1,200.2 km (Woodward *et al.,* 2019), therefore there is potential for connectivity for this species between this SPA and the OAA. However, fulmars are not considered to be at risk of displacement or barrier effects (e.g. Dierschke *et al.*, 2016). The species is also considered to have a low sensitivity to collisions with OWFs (e.g. Bradbury *et al.,* 2014), as birds typically fly low to the sea surface. On this basis, there is no adverse effect on this breeding QI species at this SPA.

In relation to the Hoy SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.53 Cap d'Erquy-Cap Fréhel SPA (France)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of the Cap d'Erquy-Cap Fréhel SPA which are listed in Table 3-11.

This SPA supports breeding populations of fulmars. In addition, a number of other seabirds breed at this SPA however these species are beyond mean maximum foraging range of the Offshore Site, therefore there is no adverse effect on these species at this SPA.

Fulmars have a mean maximum foraging range of 1,200.2 km (Woodward *et al.,* 2019), therefore there is potential for connectivity for this species between this SPA and the OAA. However, fulmars are not considered to be at risk of displacement or barrier effects (e.g. Dierschke *et al.*, 2016). The species is also considered to have a low sensitivity to collisions with OWFs (e.g. Bradbury *et al.,* 2014), as birds typically fly low to the sea surface. On this basis, there is no adverse effect on this breeding QI species at this SPA.

In relation to the Cap d'Erquy-Cap Fréhel SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.54 Rousay SPA (UK9002371)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of the Rousay SPA which are listed in Table 3-11.

This SPA is classified for the protection of breeding fulmars, Arctic skuas, kittiwakes, Arctic terns and guillemots, as well as an internationally important assemblage of over 20,000 breeding seabirds (JNCC, 2024). Arctic skua has been excluded from further assessment on the basis that this species was not recorded within the OAA on baseline surveys (Table 3-2). Where seabird species were not recorded in the OAA over the duration of site-specific baseline surveys (24 months), it is considered objectively reasonable using expert judgement to exclude them from further assessment. Seabird species that were not recorded in the OAA on baseline surveys were considered extremely unlikely to use the OAA in numbers large enough to warrant further consideration.

The Offshore Site is outside mean maximum foraging range of breeding kittiwakes, Arctic terns and guillemots from this SPA (Woodward *et al.,* 2019), therefore there is no risk that breeding adults of these species from this SPA will be present in the OAA during the breeding season. On this basis, there is no adverse effect on these breeding species at this SPA.

Fulmars have a mean maximum foraging range of 1,200.2 km (Woodward *et al.,* 2019), therefore there is potential for connectivity for this species between this SPA and the OAA. However, fulmars are not considered to be at risk of displacement or barrier effects (e.g. Dierschke *et al*., 2016). The species is also considered to have a low sensitivity to collisions with OWFs (e.g. Bradbury *et al.,* 2014), as birds typically fly low to the sea surface. On this basis, there is no adverse effect on this breeding QI species at this SPA.

In relation to the Rousay SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.55 West Westray SPA (UK9002101)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of the West Westray SPA which are listed in Table 3-11.

This SPA is classified for the protection of breeding fulmars, Arctic skuas, kittiwakes, Arctic terns, guillemots and razorbills, as well as an internationally important assemblage of over 20,000 breeding seabirds (JNCC, 2024).

Arctic skua has been excluded from further assessment on the basis that this species was not recorded within the OAA on baseline surveys (Appendix 5). Where seabird species were not recorded in the OAA over the duration of site-specific baseline surveys (24 months), it is considered objectively reasonable using expert judgement to exclude them from further assessment. Seabird species that were not recorded in the OAA on baseline surveys were considered extremely unlikely to use the OAA in numbers large enough to warrant further consideration.

The Offshore Site is outside mean maximum foraging range of breeding kittiwakes, Arctic terns, guillemots and razorbills from this SPA (Woodward *et al.,* 2019), therefore there is no risk that breeding adults of these species from this SPA will be present in the OAA during the breeding season. On this basis, there is no adverse effect on these breeding species at this SPA.

Fulmars have a mean maximum foraging range of 1,200.2 km (Woodward *et al.,* 2019), therefore there is potential for connectivity for this species between this SPA and the OAA. However, fulmars are not considered to be at risk of displacement or barrier effects (e.g. Dierschke *et al.*, 2016). The species is also considered to have a low sensitivity to collisions with OWFs (e.g. Bradbury *et al.,* 2014), as birds typically fly low to the sea surface. On this basis, there is no adverse effect on this breeding QI species at this SPA.

In relation to the West Westray SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.56 Copinsay SPA (UK9002151)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of the Copinsay SPA which are listed in Table 3-11.

This SPA is classified for the protection of breeding fulmars, great black-backed gulls, kittiwakes and guillemots, as well as an internationally important assemblage of over 20,000 breeding seabirds (JNCC, 2024).

The Offshore Site lies outside the mean maximum foraging range of breeding great black-backed gulls, kittiwakes and guillemots from this SPA (Woodward *et al.,* 2019), therefore there is no risk that breeding adults of these species from this SPA will be present in the OAA during the breeding season. On this basis, there is no adverse effect on these breeding species at this SPA .

Fulmars have a mean maximum foraging range of 1,200.2 km (Woodward *et al.,* 2019), therefore there is potential for connectivity for this species between this SPA and the OAA. However, fulmars are not considered to be at risk of displacement or barrier effects (e.g. Dierschke *et al.*, 2016). The species is also considered to have a low sensitivity to collisions with OWFs (e.g. Bradbury *et al.,* 2014), as birds typically fly low to the sea surface. On this basis, there is no adverse effect on this breeding QI species at this SPA.

In relation to the Copinsay SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.57 East Caithness Cliffs SPA (UK9001182)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of the East Caithness Cliffs SPA which are listed in Table 3-11.

This SPA is classified for the protection of breeding fulmars, cormorants, shags, herring gulls, great black-backed gulls, kittiwakes, guillemots and razorbills, as well as an internationally important assemblage of over 20,000 breeding seabirds. In addition, peregrine is also listed as a QI for this SPA (JNCC, 2024).

Peregrine is a terrestrial species and there is no pathway for this species from this SPA to be at risk of adverse effects from the Offshore Site, so it is not considered further here.

The Offshore Site is outside mean maximum foraging range of breeding cormorants, shags, herring gulls, great black-backed gulls, kittiwakes, guillemots and razorbills from this SPA (Woodward *et al.,* 2019), therefore there is no risk that breeding adults of these species from this SPA will be present in the OAA during the breeding season. On this basis, there is no adverse effect on these breeding species at this SPA.

Fulmars have a mean maximum foraging range of 1,200.2 km (Woodward *et al.,* 2019), therefore there is potential for connectivity for this species between this SPA and the OAA. However, fulmars are not considered to be at risk of displacement or barrier effects (e.g. Dierschke *et al.*, 2016). The species is also considered to have a low sensitivity to collisions with OWFs (e.g. Bradbury *et al.,* 2014), as birds typically fly low to the sea surface. On this basis, there is no adverse effect on this breeding QI species at this SPA.

In relation to the East Caithness Cliffs SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.58 Calf of Eday SPA UK9002431)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of the Calf of Eday SPA which are listed in Table 3-11.

This SPA is classified for the protection of breeding fulmars, cormorants, great black-backed gulls, kittiwakes and guillemots (JNCC, 2024).

The Offshore Site is outside mean maximum foraging range of breeding cormorants, great black-backed gulls, kittiwakes and guillemots from this SPA (Woodward *et al.,* 2019), therefore there is no risk that breeding adults of these species from this SPA will be present in the OAA during the breeding season. On this basis, there is no adverse effect on these breeding species at this SPA.

Fulmars have a mean maximum foraging range of 1,200.2 km (Woodward *et al.,* 2019), therefore there is potential for connectivity for this species between this SPA and the OAA. However, fulmars are not considered to be at risk of displacement or barrier effects (e.g. Dierschke *et al.*, 2016). The species is also considered to have a low sensitivity to collisions with OWFs (e.g. Bradbury *et al.,* 2014), as birds typically fly low to the sea surface. On this basis, there is no adverse effect on this breeding QI species at this SPA.

In relation to the Calf of Eday SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.59 Iles Houat-Hoedic SPA (France)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of the Iles Houat-Hoedic SPA which are listed in Table 3-11.

This SPA supports breeding populations of Manx shearwaters. In addition, a number of other seabirds breed at this SPA however these species are beyond mean maximum foraging range of the Offshore Site, therefore there is no adverse effect on these species at this SPA.

Manx shearwaters have a very large mean maximum foraging range (2,366 km) (Woodward *et al.,* 2019) and are therefore not considered to be at risk of displacement or barrier effects (e.g. Bradbury *et al.,* 2014). This species is also not considered to be at risk of collision impacts (e.g. Bradbury *et al.,*

2014) as birds typically fly low to the sea surface. On this basis, there is no adverse effect on this breeding QI species at this SPA.

In relation to the Iles Houat-Hoedic SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.60 Falaise du Bessin Occidental SPA (France)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of the Falaise du Bessin Occidental SPA which are listed in Table 3-11.

This SPA supports breeding populations of fulmars. In addition, a number of other seabirds breed at this SPA however these species are beyond mean maximum foraging range of the Offshore Site, therefore there is no adverse effect on these species at this SPA.

Fulmars have a mean maximum foraging range of 1,200.2 km (Woodward *et al.,* 2019), therefore there is potential for connectivity for this species between this SPA and the OAA. However, fulmars are not considered to be at risk of displacement or barrier effects (e.g. Dierschke *et al.*, 2016). The species is also considered to have a low sensitivity to collisions with OWFs (e.g. Bradbury *et al.,* 2014), as birds typically fly low to the sea surface. On this basis, there is no adverse effect on this breeding QI species at this SPA.

In relation to the Falaise du Bessin Occidental SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.61 Seas off Foula SPA (UK9020331)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of the Seas off Foula SPA which are listed in Table 3-11.

This SPA is classified for the protection of breeding fulmars, great skuas, Arctic skuas, guillemots and puffins (JNCC, 2024).

Great skua and Arctic skua have been excluded from further assessment on the basis that these species were not recorded within the OAA on baseline surveys (Appendix 5). Where seabird species were not recorded in the OAA over the duration of site-specific baseline surveys (24 months), it is considered objectively reasonable using expert judgement to exclude them from further assessment. Seabird species that were not recorded in the OAA on baseline surveys were considered extremely unlikely to use the OAA in numbers large enough to warrant further consideration.

The Offshore Site is outside mean maximum foraging range of breeding guillemots and puffins from this SPA (Woodward *et al.,* 2019), therefore there is no risk that breeding adults of these species from this SPA will be present in the OAA during the breeding season. On this basis, there is no adverse effect on these breeding species at this SPA.

Fulmars have a mean maximum foraging range of 1,200.2 km (Woodward *et al.,* 2019), therefore there is potential for connectivity for this species between this SPA and the OAA. However, fulmars are not considered to be at risk of displacement or barrier effects (e.g. Dierschke *et al.*, 2016). The species is also considered to have a low sensitivity to collisions with OWFs (e.g. Bradbury *et al.,* 2014), as birds typically fly low to the sea surface. On this basis, there is no adverse effect on this breeding QI species at this SPA.

In relation to the Seas off Foula SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.62 Fair Isle SPA (UK9002091)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of the Fair Isle SPA which are listed in Table 3-11.

This SPA is classified for the protection of breeding fulmars, shags, gannets, great skuas, Arctic skuas, kittiwakes, Arctic terns, guillemots, razorbills and puffins, as well as an internationally important assemblage of over 20,000 breeding seabirds (JNCC, 2024).

Great skua and Arctic skua have been excluded from further assessment on the basis that these species were not recorded within the OAA on baseline surveys (Appendix 5). Where seabird species were not recorded in the OAA over the duration of site-specific baseline surveys (24 months), it is considered objectively reasonable using expert judgement to exclude them from further assessment. Seabird species that were not recorded in the OAA on baseline surveys were considered extremely unlikely to use the OAA in numbers large enough to warrant further consideration.

The Offshore Site is outside mean maximum foraging range of breeding shags, gannets, kittiwakes, Arctic terns, guillemots, razorbills and puffins from this SPA (Woodward *et al.,* 2019), therefore there is no risk that breeding adults of these species from this SPA will be present in the OAA during the breeding season. On this basis, there is no adverse effect on these breeding species at this SPA.

Fulmars have a mean maximum foraging range of 1,200.2 km (Woodward *et al.,* 2019), therefore there is potential for connectivity for this species between this SPA and the OAA. However, fulmars are not considered to be at risk of displacement or barrier effects (e.g. Dierschke *et al.*, 2016). The species is also considered to have a low sensitivity to collisions with OWFs (e.g. Bradbury *et al.,* 2014), as birds typically fly low to the sea surface. On this basis, there is no adverse effect on this breeding QI species at this SPA.

In relation to the Fair Isle SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.63 Littoral seino-marin SPA (France)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of the Littoral seino-marin SPA which are listed in Table 3-11.

This SPA supports breeding populations of fulmars. In addition, a number of other seabirds breed at this SPA however these species are beyond mean maximum foraging range of the Offshore Site, therefore there is no adverse effect on these species at this SPA.

Fulmars have a mean maximum foraging range of 1,200.2 km (Woodward *et al.,* 2019), therefore there is potential for connectivity for this species between this SPA and the OAA. However, fulmars are not considered to be at risk of displacement or barrier effects (e.g. Dierschke *et al.*, 2016). The species is also considered to have a low sensitivity to collisions with OWFs (e.g. Bradbury *et al.,* 2014), as birds typically fly low to the sea surface. On this basis, there is no adverse effect on this breeding QI species at this SPA.

In relation to the Littoral seino-marin SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.64 Troup, Pennan and Lion's Heads SPA (UK9002471)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of the Troup, Pennan and Lion's Heads SPA which are listed in Table 3-11.

This SPA is classified for the protection of breeding fulmars, herring gulls, kittiwakes, guillemots and razorbills, as well as an internationally important assemblage of over 20,000 breeding seabirds (JNCC, 2024).

The Offshore Site is outside mean maximum foraging range of breeding herring gulls, kittiwakes, guillemots and razorbills from this SPA (Woodward *et al.,* 2019), therefore there is no risk that breeding adults of these species from this SPA will be present in the OAA during the breeding season. On this basis, there is no adverse effect on these breeding species at this SPA.

Fulmars have a mean maximum foraging range of 1,200.2 km (Woodward *et al.,* 2019), therefore there is potential for connectivity for this species between this SPA and the OAA. However, fulmars are not considered to be at risk of displacement or barrier effects (e.g. Dierschke *et al.*, 2016). The species is also considered to have a low sensitivity to collisions with OWFs (e.g. Bradbury *et al.,* 2014), as birds typically fly low to the sea surface. On this basis, there is no adverse effect on this breeding QI species at this SPA.

In relation to the Troup, Pennan and Lion's Heads SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.65 Foula SPA (UK9002061)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of the Foula SPA which are listed in Table 3-11.

This SPA is classified for the protection of breeding red-throated divers, fulmars, Leach's petrels, shags, great skuas, Arctic skuas, kittiwakes, Arctic terns, guillemots and razorbills, as well as an internationally important assemblage of over 20,000 breeding seabirds (JNCC, 2024).

Red-throated diver, Leach's petrel, great skua and Arctic skua have been excluded from further assessment on the basis that these species were not recorded within the OAA on baseline surveys (Appendix 5). Where seabird species were not recorded in the OAA over the duration of site-specific baseline surveys (24 months), it is considered objectively reasonable using expert judgement to exclude them from further assessment. Seabird species that were not recorded in the OAA on baseline surveys were considered extremely unlikely to use the OAA in numbers large enough to warrant further consideration.

The Offshore Site is outside mean maximum foraging range of breeding shags, kittiwakes, Arctic terns, guillemots and razorbills from this SPA (Woodward *et al.,* 2019), therefore there is no risk that breeding adults of these species from this SPA will be present in the OAA during the breeding season. On this basis, there is no adverse effect on these breeding species at this SPA.

Fulmars have a mean maximum foraging range of 1,200.2 km (Woodward *et al.,* 2019), therefore there is potential for connectivity for this species between this SPA and the OAA. However, fulmars are not considered to be at risk of displacement or barrier effects (e.g. Dierschke *et al*., 2016). The species is also considered to have a low sensitivity to collisions with OWFs (e.g. Bradbury *et al.,* 2014), as birds typically fly low to the sea surface. On this basis, there is no adverse effect on this breeding QI species at this SPA.

In relation to the Foula SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.66 Sumburgh Head SPA (UK9002511)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of the Sumburgh Head SPA which are listed in Table 3-11.

This SPA is classified for the protection of breeding fulmars, kittiwakes, Arctic terns and guillemots, as well as an internationally important assemblage of over 20,000 breeding seabirds (JNCC, 2024).

The Offshore Site is outside mean maximum foraging range of breeding kittiwakes, Arctic terns and guillemots from this SPA (Woodward *et al.,* 2019), therefore there is no risk that breeding adults of these species from this SPA will be present in the OAA during the breeding season. On this basis, there is no adverse effect on these breeding species at this SPA.

Fulmars have a mean maximum foraging range of 1,200.2 km (Woodward *et al.,* 2019), therefore there is potential for connectivity for this species between this SPA and the OAA. However, fulmars are not considered to be at risk of displacement or barrier effects (e.g. Dierschke *et al*., 2016). The species is also considered to have a low sensitivity to collisions with OWFs (e.g. Bradbury *et al.,* 2014), as birds typically fly low to the sea surface. On this basis, there is no adverse effect on this breeding QI species at this SPA.

In relation to the Sumburgh Head SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.67 Buchan Ness to Collieston Coast SPA (UK9002491)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of the Buchan Ness to Collieston Coast SPA which are listed in Table 3-11.

This SPA is classified for the protection of breeding fulmars, shags, herring gulls, kittiwakes and guillemots, as well as an internationally important assemblage of over 20,000 breeding seabirds (JNCC, 2024).

The Offshore Site is outside mean maximum foraging range of breeding kittiwakes, Arctic terns and guillemots from this SPA (Woodward *et al.,* 2019), therefore there is no risk that breeding adults of these species from this SPA will be present in the OAA during the breeding season. On this basis, there is no adverse effect on these breeding species at this SPA.

Fulmars have a mean maximum foraging range of 1,200.2 km (Woodward *et al.,* 2019), therefore there is potential for connectivity for this species between this SPA and the OAA. However, fulmars are not considered to be at risk of displacement or barrier effects (e.g. Dierschke *et al*., 2016). The species is also considered to have a low sensitivity to collisions with OWFs (e.g. Bradbury *et al.,* 2014), as birds typically fly low to the sea surface. On this basis, there is no adverse effect on this breeding QI species at this SPA.

In relation to the Buchan Ness to Collieston Coast SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.68 Noss SPA (UK9002081)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of the Noss SPA which are listed in Table 3-11.

This SPA is classified for the protection of breeding fulmars, gannets, great skuas, kittiwakes, guillemots and puffins, as well as an internationally important assemblage of over 20,000 breeding seabirds (JNCC, 2024).

Great skua has been excluded from further assessment on the basis that this species was not recorded within the OAA on baseline surveys (Appendix 5). Where seabird species were not recorded in the OAA over the duration of site-specific baseline surveys (24 months), it is considered objectively reasonable using expert judgement to exclude them from further assessment. Seabird species that were not recorded in the OAA on baseline surveys were considered extremely unlikely to use the OAA in numbers large enough to warrant further consideration.

The Offshore Site is outside mean maximum foraging range of breeding gannets, kittiwakes, guillemots and puffins from this SPA (Woodward *et al.,* 2019), therefore there is no risk that breeding adults of these species from this SPA will be present in the OAA during the breeding season. On this basis, there is no adverse effect on these breeding species at this SPA.

Fulmars have a mean maximum foraging range of 1,200.2 km (Woodward *et al.,* 2019), therefore there is potential for connectivity for this species between this SPA and the OAA. However, fulmars are not considered to be at risk of displacement or barrier effects (e.g. Dierschke *et al.*, 2016). The species is also considered to have a low sensitivity to collisions with OWFs (e.g. Bradbury *et al.,* 2014), as birds typically fly low to the sea surface. On this basis, there is no adverse effect on this breeding QI species at this SPA.

In relation to the Noss SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.69 Hermaness, Saxa Vord and Valla Field SPA (UK9002011)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of the Hermaness, Saxa Vord and Valla Field SPA which are listed in Table 3-11.

This SPA is classified for the protection of breeding red-throated divers, fulmars, gannets, shags, great skuas, kittiwakes, guillemots and puffins, as well as an internationally important assemblage of over 20,000 breeding seabirds (JNCC, 2024).

Red-throated diver and great skua have been excluded from further assessment on the basis that these species were not recorded within the OAA on baseline surveys (Appendix 5). Where seabird species were not recorded in the OAA over the duration of site-specific baseline surveys (24 months), it is considered objectively reasonable using expert judgement to exclude them from further assessment. Seabird species that were not recorded in the OAA on baseline surveys were considered extremely unlikely to use the OAA in numbers large enough to warrant further consideration.

The Offshore Site is outside mean maximum foraging range of breeding gannets, shags, kittiwakes, guillemots and puffins from this SPA (Woodward *et al.,* 2019), therefore there is no risk that breeding adults of these species from this SPA will be present in the OAA during the breeding season. On this basis, there is no adverse effect on these breeding species at this SPA.

Fulmars have a mean maximum foraging range of 1,200.2 km (Woodward *et al.,* 2019), therefore there is potential for connectivity for this species between this SPA and the OAA. However, fulmars are not considered to be at risk of displacement or barrier effects (e.g. Dierschke *et al.*, 2016). The species is also considered to have a low sensitivity to collisions with OWFs (e.g. Bradbury *et al.,* 2014), as birds typically fly low to the sea surface. On this basis, there is no adverse effect on this breeding QI species at this SPA.

In relation to the Hermaness, Saxa Vord and Valla Field SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.70 Fetlar SPA (UK9002031)

This section assesses whether the Offshore Site alone, in light of best available scientific information, would adversely affect the integrity of Conservation Objectives of the Fetlar SPA which are listed in Table 3-11.

This SPA is classified for the protection of breeding fulmars, great skuas, Arctic skuas, and Arctic terns, as well as an internationally important assemblage of over 20,000 breeding seabirds. In addition, breeding dunlin, whimbrel, and red-necked phalarope are also QIs for this SPA (JNCC, 2024).

Great skua, Arctic skua and red-necked phalarope have been excluded from further assessment on the basis that these species were not recorded within the OAA on baseline surveys (Appendix 5). Where seabird species were not recorded in the OAA over the duration of site-specific baseline surveys (24 months), it is considered objectively reasonable using expert judgement to exclude them from further assessment. Seabird species that were not recorded in the OAA on baseline surveys were considered extremely unlikely to use the OAA in numbers large enough to warrant further consideration.

Breeding dunlin and whimbrel at this SPA are not considered likely to pass through the OAA on migration based on the location of this SPA in relation to the OAA, therefore there is no adverse effect on these species at this SPA.

The Offshore Site is outside mean maximum foraging range of breeding Arctic terns from this SPA (Woodward *et al.,* 2019), therefore there is no risk that breeding adults from this SPA will be present in the OAA during the breeding season. On this basis, there is no adverse effect on this breeding species at this SPA.

Fulmars have a mean maximum foraging range of 1,200.2 km (Woodward *et al.,* 2019), therefore there is potential for connectivity for this species between this SPA and the OAA. However, fulmars are not considered to be at risk of displacement or barrier effects (e.g. Dierschke *et al.*, 2016). The species is also considered to have a low sensitivity to collisions with OWFs (e.g. Bradbury *et al.,* 2014), as birds typically fly low to the sea surface. On this basis, there is no adverse effect on this breeding QI species at this SPA.

In relation to the Fetlar SPA, having considered the information presented above it is concluded that the Offshore Site will not result in any adverse effects on the integrity of the SPA, in light of its conservation objectives and in light of best available scientific information.

4.2.4.71 In combination effects on European Sites with bird QI

This section outlines the in-combination effects assessment on SPAs and takes into account the impacts of the Offshore Site alone, together with other plans and projects The screening process involved determination of appropriate search areas for projects, plans and activities and Zones of Influence (ZoIs) for potential cumulative impacts. These were then screened according to the level of detail publicly available and the potential for interactions with regard to the presence of an impact pathway as well as spatial and temporal overlap.

The projects and plans selected as potentially relevant to the assessment of in-combination effects on the integrity of European Sites with bird QI were based upon an initial screening exercise undertaken on a long list of existing and reasonably foreseeable projects and plans.

As detailed in Section 1.4.4, no plans were identified that could contribute to any in-combination effects with the Offshore Site of the Project. As such, only projects that could potentially lead to in-combination impacts were considered further.

Offshore Projects other than OWF projects e.g. dredging activities or port extensions have been screened out of this assessment on the basis that the potential for any significant in-combination interactions on European Sites with bird QI with the Offshore Site is very unlikely because the contribution from the Offshore Site in terms of temporary habitat loss/disturbance and increased suspended sediment concentrations (SSCs) is predicted to not be a significant effect).

For the breeding season ZoI, only consented or submitted OWF projects within the Offshore Ornithology Regional Study Area (509.4 km) were considered to have the potential to add any direct or indirect in-combination impact to European Sites with bird QI in the breeding season. OWF projects at greater distances were screened out on the basis of the very low likelihood of seabirds from breeding colonies beyond this distance foraging within the OAA in the breeding season (Table 4-68). Future OWF projects that have yet to submit an EIAR were also screened out on the basis of there being insufficient data publicly available to undertake any assessment.

In the non-breeding season, a similar ZoI was considered, based on all operational, consented or submitted OWF projects within Irish waters and west coast of the UK.

Table 4-68 Distances of other OWF projects considered within the In-combination Assessment

Project	Status	Distance from Sceirde Rocks	Screened IN/OUT of CEA
Arklow Bank Phase I	Operational	611.7 km	OUT
Arklow Bank Phase II	Submitted	612.5 km	OUT
Codling Wind Park	Submitted	645.5 km	OUT
Dublin Array	Submission Due	665.9 km	OUT
NISA	Submitted	681.2 km	OUT
Oriel Wind Farm	Submitted	663.0 km	OUT
Gwynt y Mor	Operational	760.73	OUT
Burbo Bank Extension	Operational	782.39	OUT
Burbo Bank	Operational	785.23	OUT

Project	Status	Distance from Sceirde Rocks	Screened IN/OUT of CEA
Walney 2	Operational	711.91	OUT
Walney 1	Operational	719.43	OUT
West of Duddon Sands	Operational	729.74	OUT
Barrow	Operational	734.32	OUT
Ormonde	Operational	725.93	OUT
Rhyl Flats	Operational	766.21	OUT
North Hoyle	Operational	770.13	OUT
TwinHub	Consented	589.41	OUT
Awel y Môr	Consented	753.49	OUT
Erebus	Consented	568.68	OUT
Mona	Submitted	723.93	OUT
Morecambe	Submitted	740.90	OUT
Morgan	Submitted	716.84	OUT
Whitecross	Submitted	600.97	OUT
West of Orkney	Submitted	856.85	OUT

As there are no operational, consented or submitted OWF projects within 509.4 km, it is considered that there will be no in-combination effects on the integrity of European Sites with bird QI arising in the breeding season. Similarly in the non-breeding season, when seabirds are not linked to their breeding colonies, it is considered that the distance between the Offshore Site and other operational, consented or submitted OWF projects will make the potential for any significant in-combination interactions very unlikely.

In addition, the assessment of the SPAs concluded that there would be no project-alone impacts on the integrity of any of the European Sites with bird QI arising from the Offshore Site. Any such impacts were assessed as being below the threshold at which any effects could be distinguished from natural background variations (Parker *et al.,* 2022c).

Therefore, in-combination effects on European Sites with bird QI arising from the Offshore Site and other operational, consented or submitted OWF projects in Irish and west coast UK on are not considered further in this assessment.

5. IN-CUMULATION ASSESSMENT

The potential for residual adverse effects on the integrity of each European Site following the implementation of mitigation, is summarised in this section of the report. It also assesses the potential for adverse effects on the integrity of the European Sites when the Offshore and Onshore sites are considered in cumulation.

5.1 Summary of Residual adverse effects from Offshore Site

Based on the preceding sections, in view of best scientific knowledge, on the basis of objective information, there is no potential for adverse effect on the identified QIs and their associated targets and attributes, and therefore on the integrity of any European Site. Potential pathways for effect have been robustly prevented through measures to avoid impacts and the incorporation of best practice/mitigation measures into the project design.

Taking cognisance of measures to avoid impacts and best practice/mitigation measures incorporated into the project design which are considered in the preceding section, the Offshore Site alone will not have an adverse effect on the integrity of any of the following European Sites:

- Inishmore Island SAC,
- Kilkieran Bay and Islands SAC,
- Lower River Shannon SAC,
- Slyne Head Peninsula SAC,
- Slyne Head Islands SAC,
- West Connacht Coast SAC,
- Galway Bay Complex SAC,
- Blasket Islands SAC,
- Duvillaun Islands SAC,
- Connemara Bog Complex SAC,
- Twelve Bens/Garraun Complex SAC,
- Maumturk Mountains SAC,
- Lough Corrib SAC,
- Mweelrea/Sheeffry/Erriff Complex SAC,
- Inishmaan Island SAC,
- Carrowmore Point to Spanish Point and Islands SAC,
- Carrowmore Dunes SAC,
- Kilkee Reefs SAC,
- Mid-Clare Coast SPA
- Slyne Head to Ardmore Point Islands SPA
- Inishmore SPA
- Cruagh Island SPA
- River Shannon and River Fergus Estuaries SPA
- Cliffs of Moher SPA
- Illaunonearaun SPA
- High Island, Inishark and Duvillaun SPA
- Inner Galway Bay SPA
- Illaunnanoon SPA
- Magharee Islands SPA
- Clare Island SPA
- Loop Head SPA
- Bills Rock SPA
- Dingle Peninsula SPA

- Duvillaun Islands SPA
- Inishglora and InisKeeragh SPA
- Blasket Islands SPA
- Puffin Islands SPA
- Iveragh Peninsula SPA
- Skelligs SPA
- Stages of Broadhaven SPA
- Eirk SPA
- The Gearagh SPA
- Deenish Island and Scariff Island SPA
- Clonakilty SPA
- Illanmaster SPA
- The Bull and The Cow Rocks SPA
- Beara Peninsula SPA
- Aughris Head SPA
- West Donegal Coast SPA
- Tory Island SPA
- Horn Head to Fanad Head SPA
- Saltee Islands SPA
- Mingulay and Berneray SPA
- Skomer, Skokholm and the Seas off Pembrokeshire / Sgomer, Sgogwm a Moroedd Penfro SPA
- Rum SPA
- Seas off St Kilda SPA
- St Kilda SPA
- Copeland Islands SPA
- Glannau Aberdaron ac Ynys Enlli/ Aberdaron Coast and Bardsey Island SPA
- Shiant Isles SPA
- Flannan Isles SPA
- Lambay Island SPA
- Ouessant-Molène SPA (France)
- Handa SPA
- Cape Wrath SPA
- Cote de Granit Rose-Sept Iles SPA
- Camaret SPA
- North Rona and Sula Sgeir SPA
- North Caithness Cliffs SPA
- Hoy SPA
- Cap d'Erquy-Cap Fréhel SPA (France)
- Rousay SPA
- West Westray SPA
- Copinsay SPA
- East Caithness Cliffs SPA
- Calf of Eday SPA
- Iles Houat-Hoedic SPA (France)
- Falaise du Bessin Occidental SPA (France)
- Seas off Foula SPA
- Fair Isle SPA
- Littoral seino-marin SPA
- Troup, Pennan and Lion's Heads SPA
- Foula SPA
- Sumburgh Head SPA
- Buchan Ness to Collieston Coast SPA
- Noss SPA
- Hermaness, Saxa Vord and Valla Field SPA
- Fetlar SPA

The Offshore Site will not prevent the QIs of European Sites from achieving/maintaining favourable conservation status in the future as defined in Article 1 of the EU Habitats Directive. A definition of Favourable Conservation Status is provided below:

'conservation status of a species means the sum of the influences acting on the species concerned that may affect the long-term distribution and abundance of its populations within the territory referred to in Article 2; The conservation status will be taken as 'favourable' when:

- *Population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and*
- *The natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and*
- *There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.'*

Based on the above, it can be concluded in view of best scientific knowledge, on the basis of objective information that the Offshore Site will not adversely affect the Qualifying Interests/Special Conservation Interests associated with any European Site.

5.2 Impacts of the Offshore site in-cumulation with the Onshore site

Whilst this volume of the NIS assesses whether the Offshore Site will have an adverse effect on the integrity of the European Sites, this section considers the potential for adverse effects on the integrity of European Sites as a result of the cumulation of both the Onshore Site and Offshore Site i.e. the Project.

Having regard to this document, as well as the Onshore Site included as **Volume 2** of the Project NIS, the potential for adverse effects on the integrity of the following European Sites have been identified as a result of both the Offshore and Onshore Sites:

- Lower River Shannon SAC (002165),
- Carrowmore Dunes SAC (002250),
- River Shannon and River Fergus Estuaries SPA (004077), and
- Mid-Clare Coast SPA (004182).

The assessment of residual effects from the Offshore Site was considered in cumulation with the assessment of residual effects from the Onshore Site, provided in Section 5.4 in Volume 2 of the Project NIS. When considered in cumulation, the residual effects of the project as a whole do not result in any potential for additional effects on any European Site and do not change the findings of the residual effects assessment for the Offshore Site as provided above. All potential effects have been mitigated to the extent that there is no potential for adverse effects on the integrity of any European Site, as a result of the effects of the Project (both the Onshore and Offshore Sites).

6. IN-COMBINATION ASSESSMENT

This assessment focuses on the potential for in-combination effects arising from the Project and other plans and projects on the European Sites. A search and review in relation to plans and projects that may have the potential to result in in-combination impacts on European Sites was conducted.

Following assessment of impacts of the Offshore Site on European Sites alone (which are summarised in Section 5.1) and the assessment of the in-cumulation impacts from the Offshore and Onshore Sites on European Sites (set out in Section 5.2), the following in combination impacts were assessed:

- In-combination impacts of the Offshore Site with other plans and projects on site specific QIs. This information is detailed in each receptor group section of this report and summarised in Table 4-1, Table 4-5, Table 4-14 and Table 4-60.
- In-combination assessment on site integrity of European Sites from the Offshore Site with other plans and projects, in light of the site's conservation objectives. (Section 6)
- In-combination assessment on site integrity of European Sites from the Project (Onshore and Offshore Sites) together with other plans and projects (Offshore and Onshore (NIS Volume 2 Appendix 4)), in light of the site's conservation objectives (Section 6).

6.1 Review of Other Plans and projects

Assessment material for this in-combination impact assessment was compiled on the relevant plans and projects within the vicinity of the Project (Appendix 14 - Long List of Projects) and NIS Volume 2 - Onshore Appendix 4 Review of Plans and Projects) . The material was gathered through a search of relevant online Planning Registers, reviews of relevant documents, planning application details and planning drawings, and served to identify past and future projects, their activities and their environmental impacts. Applying the methodology detailed in Section 1.4.4, all relevant plans (where applicable) and projects were considered in relation to the potential for in-combination effects. All relevant data was reviewed (e.g. individual AASRs, NISs, layouts, drawings etc.) for all relevant projects where available.

The relevant projects considered are those detailed in Table 4-1, Table 4-5, Table 4-14 and Table 4-60 in conjunction with the plans and projects described in NIS Volume 2 Onshore – Appendix 4. The residual construction, operational and decommissioning impacts of the Offshore Site are considered cumulatively with all other plans and projects. Particular focus has been placed on those projects that are in closest proximity to the Offshore Site and those that could potentially result in impacts on SCI bird species, surface water, groundwater and QI habitats and species. Subsequently the residual construction, operational and decommissioning impacts of the Project are considered in combination with other plans and project.

The potential for the Project to result in adverse effects on integrity of European Sites when assessed alongside these developments was considered. The conclusion of the NIS for these developments is that there will be no residual adverse effect on the integrity of any European Site with the implementation of mitigation measures outlined in their respective reports.

6.2 Conclusion of In-Combination Assessments for the Offshore Site

Following the detailed assessment provided in the preceding sections, it is concluded that, the Offshore Site will not result in any residual adverse effects on the integrity of any European Sites. In the review of the projects that was undertaken, two projects were identified (Kilrush and Kilkee discharge points), that could potentially result in additional or cumulative impacts. It is detailed in Section 4.1.2.12 that the extent of any sediment plumes and sediment dispersion associated with the discharge points will be on a par with, or less than that associated with construction activities. Consequently, there is no opportunity for these plumes to interact in combination. Neither was any potential identified for different (new) effects resulting from the combination of the projects and plans in association with the Onshore Site.

There is, therefore, no potential for the Offshore Site to contribute to any cumulative adverse effects on the integrity of any European Site when considered in-combination with other plans and projects.

Taking into consideration the reported residual effects on the integrity of any European Site from other plans and projects in the area and the predicted effects of the Offshore site, no residual in combination effects have been identified with regard to the integrity of any European Site.

6.3 Conclusion of In-Combination Assessments for the Project (Offshore and Onshore Sites)

Following the detailed assessment provided in Volumes 1 and 2 of the NIS, it is concluded that, the Project will not result in any residual adverse effects on the integrity of any European Sites' conservation objectives when considered on its own. In the review of the projects (Onshore and Offshore) that was undertaken, no connection, that could potentially result in combination effects was identified. Neither was any potential for different (new) effects resulting from the combination of the projects and plans in association with the Project.

There is, therefore, no potential for the Project to contribute to any cumulative adverse effects on any European Site when considered in-combination with other plans and projects.

Taking into consideration the reported residual effects on the integrity of any European Site from other plans and projects in the area and the predicted effects of the Project, no residual in combination effects have been identified with regard to the integrity of any European Site.

6.4 NIS conclusions

This NIS (Volumes 1 and 2) has assessed the impacts of the construction, operations and maintenance and decommissioning of the Project on European Sites and their relevant QI to determine whether the Project will have an adverse effect on the integrity of European Sites, either alone or in combination with other plans or projects and in light of the conservation objectives of the sites. The assessment concluded that there will be no adverse effect on the integrity of the

- Inishmore Island SAC,
- Kilkieran Bay and Islands SAC,
- Lower River Shannon SAC,
- Slyne Head Peninsula SAC,
- Slyne Head Islands SAC,
- West Connacht Coast SAC,
- Galway Bay Complex SAC,
- Blasket Islands SAC,
- Duvillaun Islands SAC,
- Connemara Bog Complex SAC,
- Twelve Bens/Garraun Complex SAC,
- Maumturk Mountains SAC,
- Lough Corrib SAC,
- Mweelrea/Sheeffry/Erriff Complex SAC,
- Inishmaan Island SAC,
- Carrowmore Point to Spanish Point and Islands SAC,
- Carrowmore Dunes SAC,

- Kilkee Reefs SAC,
- Kenmare River SAC*,
- Hook Head SAC*,
- Belgica Mound Province SAC*,
- Roaringwater Bay and Islands SAC*,
- Gweedore Bay and Islands SAC*,
- Bunduff Lough and Machair/Trawalua/Mullaghmore SAC*,
- St John's Point SAC*,
- Carnsore Point SAC*,
- Blackwater Bank SAC*,
- Lough Swilly SAC*,
- Codling Fault Zone SAC*,
- Rockabill to Dalkey SAC*,
- North Channel SAC*,
- West Wales Marine / Gorllewin Cymru Foro SAC*,
- Bristol Channel Approaches / Dynesfeydd Môr Hafren SAC*,
- Mers Celtiques - Talus du golfe de Gascogne SCI*,
- North Anglesey Marine / Gogledd Môn Foro SAC*,
- Lambay Island SAC*,
- Nord Bretagne DH SAC*,
- Ouessant-Molène SAC*,
- Abers -Côte des legends SAC*,
- Chaussée de Sein SAC*,
- Côte de Granit rose-Sept-Iles SAC*,
- Baie de Morlaix SAC*,
- Côtes de Crozon SAC*,
- Récifs et landes de la Hague SAC*,
- Anse de Vauville SAC*,
- Banc et récifs de Surtainville SAC*,
- Baie du Mont Saint-Michel SAC*,
- Estuaire de la Rance SAC*,
- Baie de Lancieux SAC, Baie de l'Arguenon, Archipel de Saint Malo et Dinard SAC*,
- Cap d'Erquy-Cap Fréhel SAC*,
- Baie de Saint-Brieuc SAC*,
- Tregor Goëlo Es SAC*,
- Mid-Clare Coast SPA
- Slyne Head to Ardmore Point Islands SPA
- Inishmore SPA
- Cruagh Island SPA
- River Shannon and River Fergus Estuaries SPA
- Cliffs of Moher SPA
- Illaunonearaun SPA
- High Island, Inishark and Duvillaun SPA
- Inner Galway Bay SPA
- Illaunnanoon SPA
- Magharee Islands SPA
- Clare Island SPA
- Loop Head SPA
- Bills Rock SPA
- Dingle Peninsula SPA
- Duvillaun Islands SPA
- Inishglora and InisKeeragh SPA
- Blasket Islands SPA
- Puffin Islands SPA
- Iveragh Peninsula SPA

- Skelligs SPA
- Stages of Broadhaven SPA
- Eirk SPA
- The Gearagh SPA
- Deenish Island and Scariff Island SPA
- Clonakilty SPA
- Illanmaster SPA
- The Bull and The Cow Rocks SPA
- Beara Peninsula SPA
- Aughris Head SPA
- West Donegal Coast SPA
- Tory Island SPA
- Horn Head to Fanad Head SPA
- Saltee Islands SPA
- Mingulay and Berneray SPA
- Skomer, Skokholm and the Seas off Pembrokeshire / Sgomer, Sgogwm a Moroedd Penfro SPA
- Rum SPA
- Seas off St Kilda SPA
- St Kilda SPA
- Copeland Islands SPA
- Glannau Aberdaron ac Ynys Enlli/ Aberdaron Coast and Bardsey Island SPA
- Shiant Isles SPA
- Flannan Isles SPA
- Lambay Island SPA
- Ouessant-Molène SPA (France)
- Handa SPA
- Cape Wrath SPA
- Cote de Granit Rose-Sept Iles SPA
- Camaret SPA
- North Rona and Sula Sgeir SPA
- North Caithness Cliffs SPA
- Hoy SPA
- Cap d'Erquy-Cap Fréhel SPA (France)
- Rousay SPA
- West Westray SPA
- Copinsay SPA
- East Caithness Cliffs SPA
- Calf of Eday SPA
- Iles Houat-Hoedic SPA (France)
- Falaise du Bessin Occidental SPA (France)
- Seas off Foula SPA
- Fair Isle SPA
- Littoral seino-marin SPA
- Troup, Pennan and Lion's Heads SPA
- Foula SPA
- Sumburgh Head SPA
- Buchan Ness to Collieston Coast SPA
- Noss SPA
- Hermaness, Saxa Vord and Valla Field SPA
- Fetlar SPA
- Tullaher Lough and Bog SAC

either as a result of the Project alone or in combination with other plans or projects, provided that the mitigation listed is adhered to.

Therefore, it can be objectively concluded, following an examination, analysis and evaluation of the relevant information, including in particular the nature of predicted impacts from the Project, that the Project, individually or in combination with other plans or projects, will not adversely affect the integrity of any European Site in light of its conservation objectives and best scientific information, and there is no reasonable scientific doubt in relation to this conclusion.

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