Morecambe Offshore Windfarm: Generation Assets

Examination Documents

Volume 4

Habitats Regulations Assessment Screening Report

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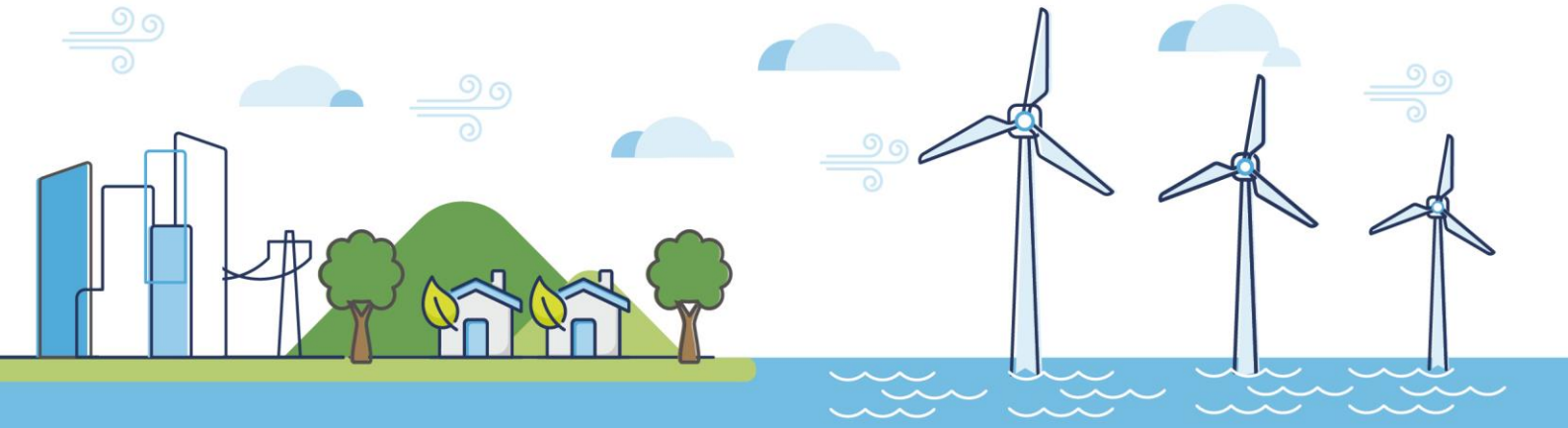
Rev 02



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Glossary of Acronyms

AA	Appropriate Assessment
AC	Alternating Current
AEoI	Adverse Effect on Integrity
AfL	Agreement for Lease
AoS	Area of Search
BAS	Burial Assessment Study
BEIS	Department for Business, Energy and Industrial Strategy[1]
BDMPS	Biologically Defined Minimum Population Scales
CBRA	Cable Burial Risk Assessment
Cefas	Centre for Environment, Fisheries and Aquaculture Science
CI	Confidence Interval
CIS	Celtic and Irish Seas
cSACs	Candidate SACs
CV	Coefficient of Variation
DAERA	Department of Agriculture, Environment and Rural Affairs
DCO	Development Consent Order
DECC	Department of Energy and Climate Change[1]
Defra	Department for Environment, Food & Rural Affairs
DESNZ	Department for Energy Security and Net Zero
DP	Dynamic Positioning
EC	European Commission
EEC	European Economic Community
EIA	Environmental Impact Assessment
EMF	Electromagnetic Field
EPP	Evidence Plan Process
ETG	Expert Topic Groups
EU	European Union
GBS	Gravity Based Structures
GIS	Geographical Information System
HAT	Highest Astronomical Tide

[1] The Department of Energy and Climate Change (DECC) was disbanded and merged with the Department for Business, Innovation and Skills to form the Department for Business, Energy and Industrial Strategy (BEIS) in 2016. As of February 2023, BEIS is known as the Department for Energy Security and Net Zero (DESNZ).

HRA	Habitats Regulations Assessment
IAMMWG	Inter-Agency Marine Mammal Working Group
IFCA	Inshore Fisheries and Conservation Authority
IROPI	Imperative Reasons of Overriding Public Interest
JCP	Joint Cetacean Protocol
JNCC	Joint Nature Conservation Committee
LAT	Lowest Astronomical Tide
LSE	Likely Significant Effect
MCA	Maritime and Coastguard Agency
MCZA	Marine Conservation Zone Assessment
MEAS	Merseyside Environmental Advisory Service
MGN	Marine Guidance Note
MHWS	Mean High Water Springs
MMMP	Marine Mammal Mitigation Protocol
MMO	Marine Management Organisation
MOD	Ministry of Defence
MU	Management Units
NSIP	Nationally Significant Infrastructure Project
NSN	National Site Network
NW	North West
OSP(s)	Offshore substation platform(s)
OWF	Offshore Wind Farm
PDE	Project Design Envelope
PEIR	Preliminary Environmental Information Report
PINS	Planning Inspectorate
PIP	Potential Impact Pathways
pSACs	Possible SACs
pSPA	Potential SPA
PTS	Permanent Threshold Shift
RIAA	Report to Inform Appropriate Assessment
RSPB	Royal Society for the Protection of Birds
SAC	Special Area of Conservation
SCANS	Small Cetaceans in the European Atlantic and North Sea
SCI	Sites of Community Importance
SCOS	Special Committee on Seals
SD	Standard Deviation

SNCBs	Statutory Nature Conservation Bodies
SoCG	Statement of Common Ground
SPA	Special Protection Area
TH	Trinity House
TTS	Temporary Threshold Shift
UK	United Kingdom
UXO	Unexploded Ordnance
WTG(s)	Wind turbine generator(s)
ZoI	Zone of Influence

Glossary of Unit Terms

km	kilometre
kV	kilovolt
m	metre
mm	millimetre
MW	Megawatt

Glossary of Terminology

Agreement for Lease (AfL)	Agreements under which seabed rights are awarded following the completion of The Crown Estate tender process.
Applicant	Morecambe Offshore Windfarm Ltd
Application	This refers to the Applicant's application for a Development Consent Order (DCO). An application consists of a series of documents and plans which are published on the Planning Inspectorate's (PINS) website.
European sites	Designated nature conservation sites which include the National Site Network (NSN) (designated within the UK) and Natura 2000 sites (designated in any European Union (EU) country). This includes candidate Special Areas of Conservation (cSAC), Sites of Community Importance (SCI), Special Areas of Conservation (SAC) and Special Protection Areas (SPAs).
Evidence Plan Process (EPP)	A voluntary consultation process with specialist stakeholders to agree the approach, and information to support, the Environmental Impact Assessment (EIA) and Habitats Regulations Assessment (HRA) for certain topics. The EPP provides a mechanism to agree the information required to be submitted to the PINS as part of the DCO Application. This function of the EPP helps Applicants to provide sufficient information in their application, so that the Examining Authority can recommend to the Secretary of State whether or not to accept the application for examination and whether an appropriate assessment is required.
Expert Topic Group (ETG)	A forum for targeted engagement with regulators and interested stakeholders through the EPP.
Generation Assets (the Project)	Generation assets associated with the Morecambe Offshore Windfarm. This is infrastructure in connection with electricity production, namely the fixed foundation wind turbine generators (WTGs), inter-array cables, offshore substation platform(s) (OSP(s)) and possible platform link cables to connect OSP(s).
In-row	The distance separating WTGs in the main rows.
Inter-array cables	Cables which link the WTGs to each other and the OSP(s).
Inter-row	The distance between the main rows.
Landfall	Where the offshore export cables would come ashore.

Morgan and Morecambe Offshore Wind Farms: Transmission Assets	The transmission assets for the Morgan Offshore Wind Project and the Morecambe Offshore Windfarm. This includes the OSP(s)[2], interconnector cables, Morgan offshore booster station, offshore export cables, landfall site, onshore export cables, onshore substations, 400kV cables and associated grid connection infrastructure such as circuit breaker infrastructure. Also referred to in this document as the Transmission Assets, for ease of reading.
Offshore export cables	The cables which would bring electricity from the OSP(s) to the landfall.
Offshore substation platform(s) (OSP(s))	A fixed structure located within the windfarm site, containing electrical equipment to aggregate the power from the WTGs and convert it into a more suitable form for export to shore.
Onshore export cables	The cables which bring electricity from landfall to the onshore project substation and from the onshore project substation to a National Grid substation.
Onshore project substation	Part of an electrical transmission and distribution system. Substations transform voltage from high to low, or the reverse by means of electrical transformers.
Platform link cable	An electrical cable which links one or more OSP(s).
Safety zones	An area around a structure or vessel which should be avoided, as set out in Section 95 of the Energy Act 2004 and the Electricity (Offshore Generating Stations) (Safety Zones) (Application Procedures and Control of Access) Regulations 2007.
Scour protection	Protective materials to avoid sediment being eroded away from the base of the foundations due to the flow of water.
Steering Group	The Applicant and key stakeholders responsible for overseeing EPP.
Technical stakeholders	Technical consultees are considered to be organisations with detailed knowledge or experience of the area within which the Project is located and/or receptors which are considered in the EIA and HRA. Examples of technical stakeholders include Marine Management Organisation (MMO), local authorities, Natural England and Royal Society for the Protection of Birds (RSPB).
Wind turbine generator (WTG)	A fixed structure located within the windfarm site that converts the kinetic energy of wind into electrical energy.

[2]At the time of writing the Environmental Statement (ES), a decision had been taken that the offshore substation platforms (OSP(s)) would remain solely within the Generation Assets application and would not be included within the DCO application for the Transmission Assets. This decision post-dated the Preliminary Environmental Information Report (PEIR) that was prepared for the Transmission Assets. The OSP(s) are still included in the description of the Transmission Assets for the purposes of this document as the in-combination effects assessment carried out in respect of the Generation/Transmission Assets is based on the information available from the Transmission Assets PEIR and associated Habitat Regulations documentation.

Windfarm site	The area within which the WTGs, inter-array cables, OSP(s) and platform link cables would be present.
Zone of Influence (ZoI)	The maximum anticipated spatial extent of a given potential impact.

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1 Introduction

1.1 The Project

1. Morecambe Offshore Windfarm: Generation Assets (hereafter referred to as the “Project”) is a proposed Offshore Windfarm (OWF) located in the Eastern Irish Sea, with an expected nominal capacity of 480 megawatts (MW). The Project is located approximately 30km off the Lancashire coast, as illustrated in **Figure 1.1**. It is being developed by Morecambe Offshore Windfarm Ltd (the Applicant).

2. As the Project windfarm is an offshore generating station of over 100MW, it is defined under the Planning Act 2008 as a Nationally Significant Infrastructure Project (NSIP) and as such it requires a Development Consent Order (DCO), which would include the grant of Deemed Marine Licence(s) (DML).

3. A Government-initiated review of OWF transmission connections has concluded that the Morecambe Offshore Windfarm would share a grid connection location at Penwortham in Lancashire with the Round 4 Morgan Offshore Wind Project, also located in the Eastern Irish Sea, as shown in **Figure 1.2**. Given this, the Applicant intends to deliver a coordinated grid connection with the Morgan Offshore Wind Project and submit a separate DCO Application for the Morgan and Morecambe Offshore Wind Farms: Transmission Assets (referred to as the “Transmission Assets”). For the purposes of this document the “Project” refers only to the Generation Assets of the Morecambe Offshore Windfarm.

4. The Project includes the Generation Assets to be located within the windfarm site (wind turbine generators (WTGs), inter-array cables, offshore substation platform(s) (OSP(s)) and possible platform link cables to connect OSP(s)). The Environmental Impact Assessment (EIA) of the Transmission Assets, including offshore export cables to landfall and onshore infrastructure, is part of a separate DCO Application as outlined in **Chapter 1 Introduction** of the Environmental Statement (ES) (Document Reference 5.1.1)

5. **Plate 1.1** provides an overview of the Project infrastructure, as well as the Transmission Assets for context.

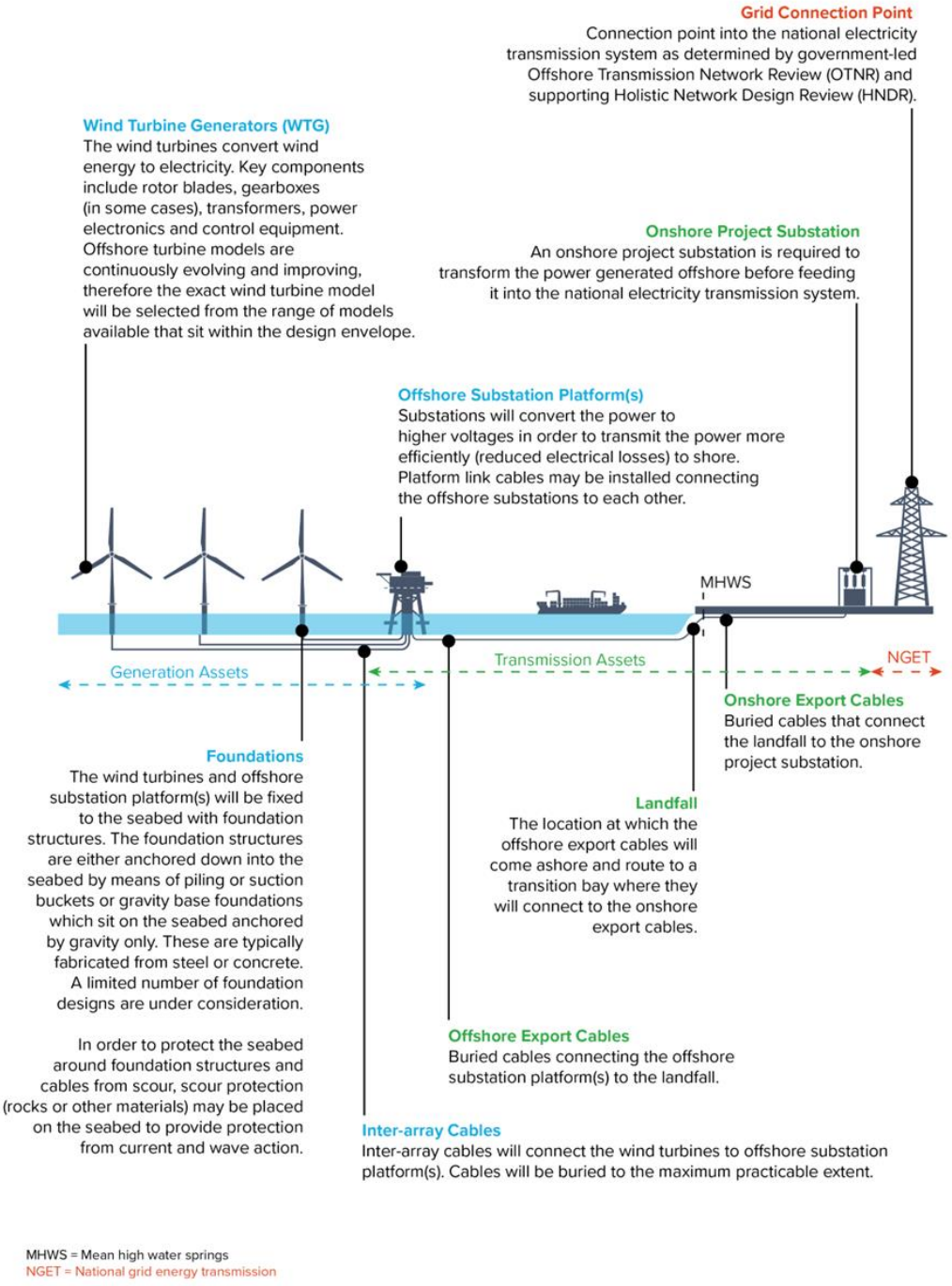
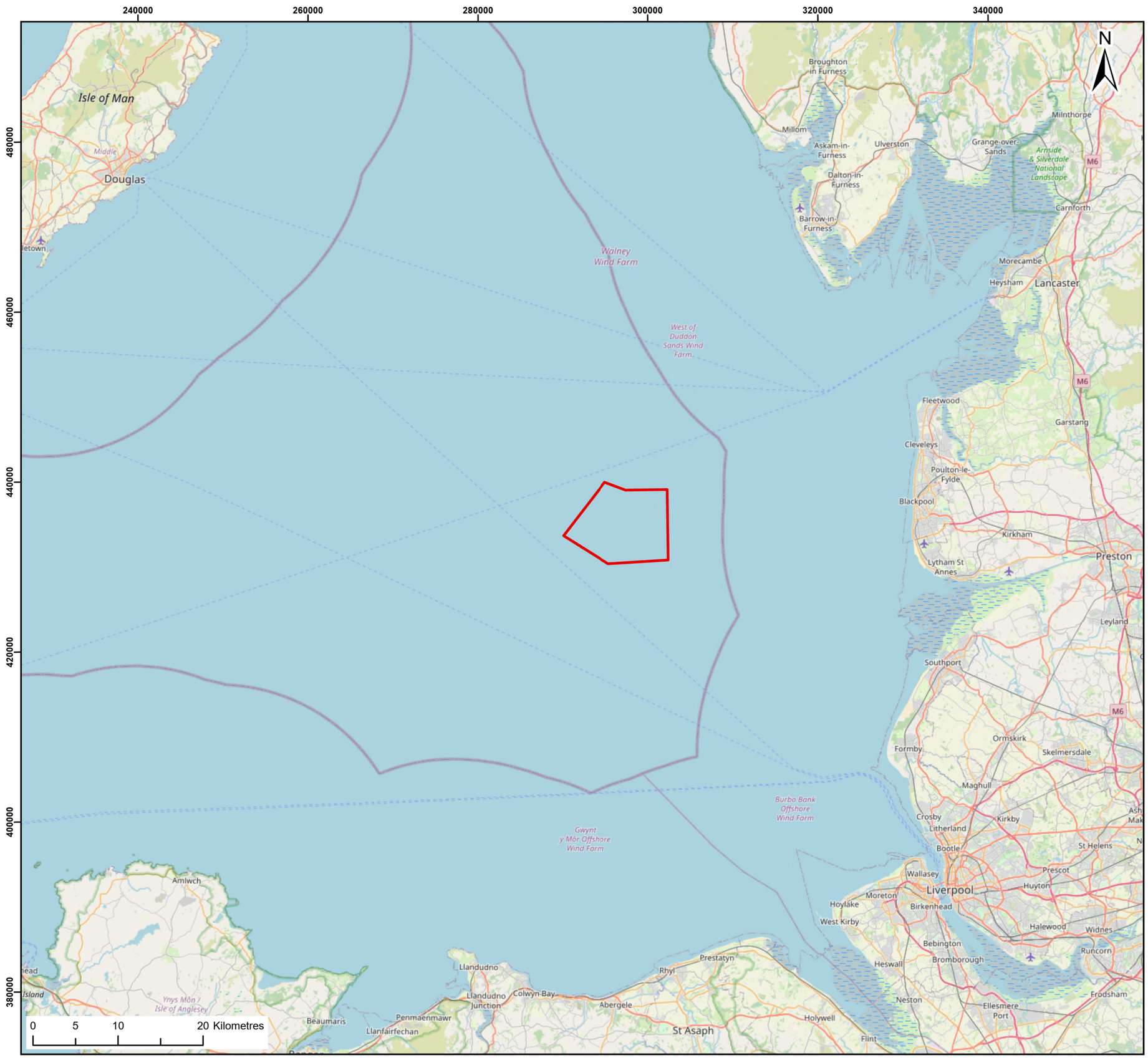


Plate 1.1 Components of Morecambe Offshore Windfarm (note the components in blue are Generation Assets and those in green are anticipated Transmission Assets)



Legend:

Morecambe Offshore Windfarm Site

Report: Morecambe Offshore Windfarm: Generation Assets HRA Screening

Title:

Morecambe Offshore Windfarm Location

Figure: 1.1

Drawing No: PC1165-RHD-ZZ-OF-DR-Z-0099

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
P01	20/05/2022	JT	SB	A3	1:450,000
P02	19/04/2024	JH	SB	A3	1:450,000

Co-ordinate system: WGS 1984 UTM Zone 30N

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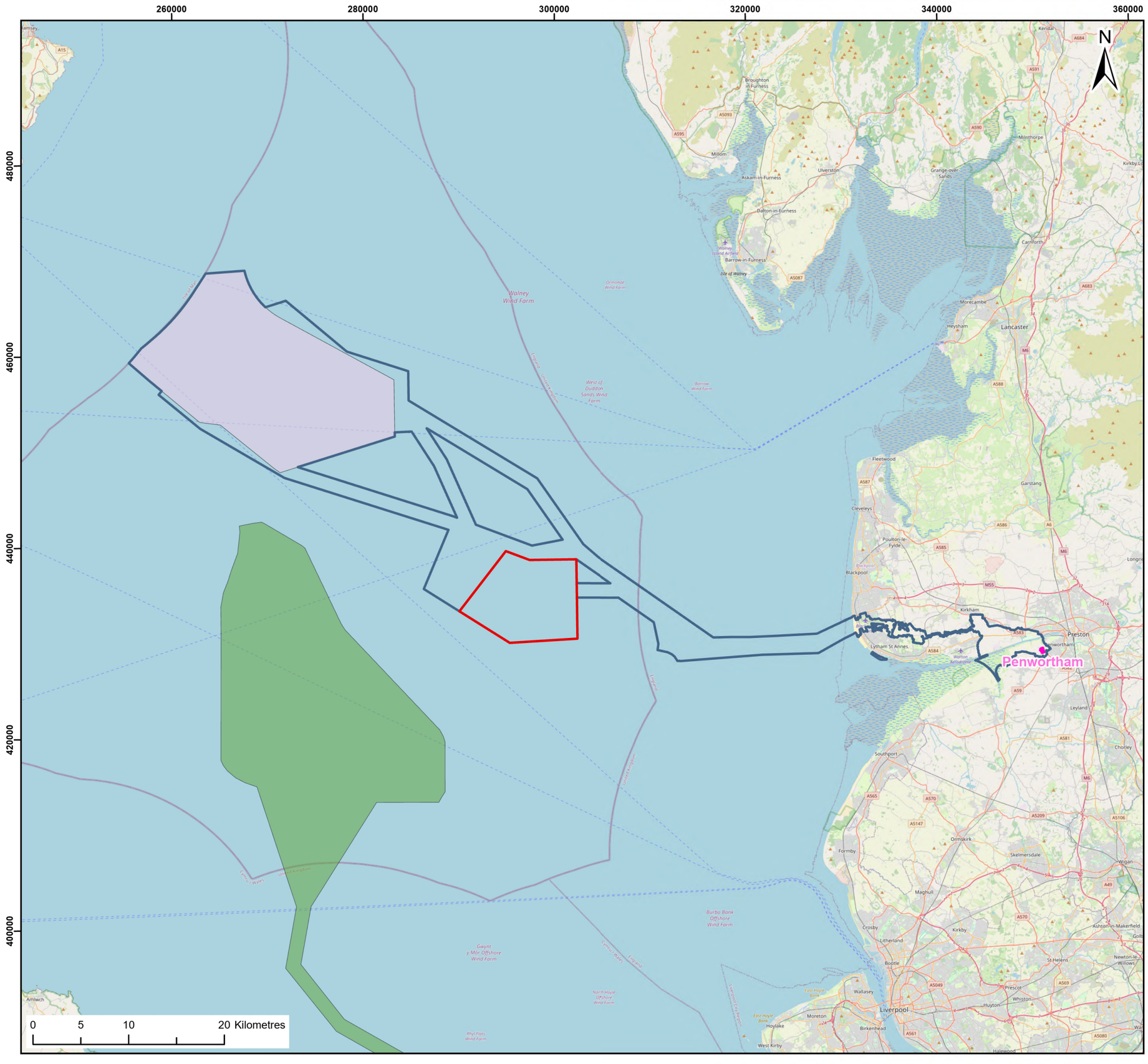

Legend:

- Morecambe Offshore Windfarm Site
- Morgan and Morecambe Offshore Wind Farms: Transmission Assets
- Morgan Offshore Wind Project Generation Assets
- Mona Offshore Wind Project
- National Grid Onshore Substation

Report: Morecambe Offshore Windfarm: Generation Assets HRA Screening

Title: Morecambe Offshore Windfarm Location With Other Round 4 Projects

Figure: 1.2

Drawing No: PC1165-RHD-ZZ-OF-DR-Z-0100

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P01	20/05/2022	JT	GC	A3	1:400,000
P02	22/04/2024	JH	SB	A3	1:400,000

Co-ordinate system: WGS 1984 UTM Zone 30N

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1.2 Purpose of this document

6. This document has been produced to inform the Habitats Regulations Assessment (HRA) process for the Project. It provides information to enable the screening of the Project with respect to its potential to have a Likely Significant Effect (LSE) on designated nature conservation sites (hereafter 'European sites'). European sites include the National Site Network (NSN) (designated within the United Kingdom (UK)) and Natura 2000 sites (designated in any European Union (EU) country) and, as described in **Section 4.1.1**, the regulations applying to these sites remain unchanged following the UK's exit from the EU.

7. The Habitats Regulations require that an HRA must be carried out on all plans and projects that are likely to have significant effects on European sites, which include Special Areas of Conservation (SACs), Candidate SACs (cSACs), Sites of Community Importance (SCI), Special Protection Areas (SPAs) and, as a matter of policy, Possible SACs (pSACs), Potential SPAs (pSPAs) and Ramsar Sites (listed under the Ramsar Convention on Wetlands of International Importance – where they are also designated as a European site).

8. European sites are proposed to be "screened out" where no LSE from the Project is predicted, alone or in-combination with other plans and projects. Where LSE cannot be ruled out at this stage, the designated site(s) have been "screened in" and assessed further. The assessment provided in this document is based on the understanding of the baseline environment (as defined for each receptor) and the scope and nature of the proposed Project activities (set out below).

9. A draft Report to Inform Appropriate Assessment (RIAA) was provided alongside the Preliminary Environmental Information Report (PEIR) for the Project during statutory consultation for the Project in 2023. Following PEIR and subsequent consultation, the draft RIAA has been revised, updated and finalised for submission, as part of the Project DCO Application.

10. This HRA Screening Report was provided to the relevant Expert Topic Groups (ETGs) (comprising technical consultees) of the Project Evidence Plan Process (EPP), to seek agreement on the designated sites which should be considered further.

11. This report forms Stage 1 of the HRA Process (discussed further in **Section 4**). In addition, a Marine Conservation Zone Assessment (MCZA) screening has been undertaken separately and in parallel to the HRA process.

1.3 Structure of this document

12. This HRA Screening Report is set out in the following stages:

- Summary of the relevant consultation undertaken to date (**Section 2**)
- Brief summary of the main components of the Project (**Section 3**)
- Brief summary of the HRA process (**Section 4**)
- HRA screening exercise, by the relevant receptors (**Section 5 – Section 8**)
- Summary of the HRA screening exercise (**Section 9**)
- References (**Section 10**)

2 Consultation

2.1 Approach to consultation

13. Consultation is an important element of the HRA process and discussion with technical consultees is crucial to the development of the assessments. This consultation has included discussions on the detailed methodologies for data collection and undertaking the impact assessments, as well as any key points raised in the responses to this HRA Screening Report.

14. The Applicant has undertaken consultation with technical regulators and stakeholders and facilitated an EPP with key stakeholders. The EPP is an integral tool for the structure and delivery of the MCZA, Environmental Impact Assessment (EIA) and HRA during the DCO pre-application phase, as well as setting the basis of Statements of Common Ground (SoCG) with relevant stakeholders.

15. As part of the Project EPP, ETGs have been established where it is relevant for multiple agencies to collectively engage in topic-specific technical discussions, including those related to the Project HRA process. From experience on other NSIPs, the EPP is very beneficial, enabling early engagement and discussion over evidence needs between applicants and relevant stakeholders. The EPP helped to identify and address evidence gaps and issues faced by projects in the DCO pre-application stage.

2.2 Consultation

16. The Applicant has proactively initiated engagement with several stakeholders from an early stage in the Project. **Table 2.1** provides an overview of stakeholder consultation undertaken relevant to the HRA process.

Table 2.1 Consultation relevant to HRA

Dates	Topic	Organisation consulted
October 2021 – June 2022	Introductory meetings	Blackpool Airport, Cumbria Local Enterprise Partnership, Environment Agency, Isle of Man Government, Isle of Man Steam Packet Company, Historic England (HE), Isle of Man Harbours and Coastguard, Lancaster City Council, Lancashire County Council, Marine Management Organisation (MMO), Maritime and Coastguard Agency (MCA), Natural England, Ministry of Defence (MOD), The National Federation of Fishermen's Organisations, North West (NW) Inshore Fisheries and Conservation Authority (IFCA), NW Wildlife Trusts (Cumbria, Lancashire & Cheshire), Peel Ports, Associated British Ports, Port of Barrow, Royal Society for the Protection of Birds (RSPB), Royal Yachting Association, Sea Truck Ferries, Stena Line Ferries, Trinity House (TH), The Planning Inspectorate (PINS), UK Chamber of Shipping, the Welsh Government, Wyre Council.
March 2022	EPP Steering Group Meeting 1	Natural England, MMO, Environment Agency, HE, PINS.
May 2022	Marine Mammal ETG 1	Natural England, MMO, Cumbria Wildlife Trust, Centre for Environment, Fisheries and Aquaculture Science (Cefas)
May 2022	Offshore Ornithology ETG 1	Natural England, MMO.
June 2022	Marine Ecology ETG 1	Natural England, MMO, Wildlife Trusts, NW IFCA, Environment Agency, Cefas.
August/September 2022	Marine Mammal ETG 2	Natural England, MMO, Cumbria Wildlife Trust, Cefas.
September 2022	EPP Steering Group Meeting 2	Natural England, MMO, Environment Agency, HE, PINS.
September 2022	Offshore Ornithology ETG 2	Natural England, MMO, RSPB.
September 2022	Marine Ecology ETG 2	Natural England, MMO, NW Wildlife Trust, Environment Agency, Cefas.
September 2022	EPP Steering Group Meeting 2	Natural England, MMO, HE, PINS.

Dates	Topic	Organisation consulted
November 2022	Marine Mammal ETG 3	Natural England, Wildlife Trusts, MMO, Isle of Man Government.
November 2022	Offshore Ornithology ETG 3	Natural England, MMO, RSPB, Isle of Man Government.
November 2022	Marine Ecology ETG 3	Natural England, MMO, Wildlife Trusts, NW IFCA, Environment Agency, Isle of Man Government
June 2023	EPP Steering Group Meeting 3	MMO, Environment Agency, HE, PINS.
June 2023	Marine Mammal ETG 4	MMO, NW Wildlife Trust, Isle of Man Government.
June 2023	Offshore Ornithology ETG 4	MMO, NE, RSPB, Isle of Man Government.
June 2023	Marine Ecology ETG 4	MMO, Cefas, NW Wildlife Trust, Isle of Man Government and NW IFCA.
October 2023	Offshore Ornithology ETG 5	MMO, NE, RSPB, Isle of Man Government and Merseyside Environmental Advisory Service (MEAS).
October 2023	Marine Ecology ETG 5	MMO, NE, Cefas Isle of Man Government, NW IFCA and MEAS.
November 2023	Marine Mammal ETG 5	NE, MMO, Cefas, Isle of Man Government and MEAS.
January 2024	Marine Mammal ETG 6	NE, MMO, Cefas, NW Wildlife Trust.
January 2024	Offshore Ornithology ETG 6	NE, MMO, RSPB, Isle of Man Government, MacArthur Green.
January 2024	Marine Ecology ETG 6	NE, MMO, Cefas, NW Wildlife Trust, Isle of Man Government.
February 2024	EPP Steering Group Meeting 4	PINS, NE, HE, MMO.
February – March 2024	E-mail correspondence	National Parks and Wildlife Service (Ireland) Department of Agriculture, Environment and Rural Affairs (DAERA) (Northern Ireland) Marine Scotland, Nature Scot (Scotland) National Resources Wales (Wales)

3 Description of the Project

17. This section provides an overview of the main components of the Project, which, for the purposes of this HRA Screening Report covers the Generation Assets (WTGs, inter-array cables, offshore substation platform(s) (OSP(s)) and possible platform link cables to connect OSP(s)). It also summarises the main activities that would occur during construction, operation and maintenance and decommissioning.

18. As described in **Paragraph 3**, following the Government-initiated review of OWF transmission connections, the transmission infrastructure to connect the Project to the National Grid are being developed and consented separately and jointly with the Round 4 Morgan Offshore Wind Project Generation Assets. Consequently, effects from the transmission infrastructure of the Morecambe Offshore Windfarm are being screened and assessed separately as part of a joint Transmission Assets EIA, HRA and subsequent DCO Application, to be submitted by Morgan Offshore Wind Limited and Morecambe Offshore Windfarm Ltd.

19. A separate HRA screening has been undertaken for the Transmission Assets and as such this associated infrastructure is not described in detail, although it is considered in the in-combination screening. The separation has not impacted the conclusions drawn in this Generation Assets screening report. Where the Transmission Assets and onshore elements of the Project are relevant, these have been referenced, for example where there may be in-combination effects.

3.1 Design envelope approach

20. The Project Design Envelope (PDE) has been developed in parallel with the EIA with the Project design outlined in **Chapter 5 Project Description** (Document Reference 5.1.5) of the ES.

21. The PDE provides maximum and minimum parameters, where appropriate, to ensure the worst-case scenario can be quantified and assessed, whilst maintaining design flexibility. Therefore, the description of the Project provided here is indicative at this stage and intended to provide context for the wider document and the basis of the assessment.

3.2 Project infrastructure overview

3.2.1 Windfarm site

22. The windfarm site would contain all generation infrastructure. The key characteristics of the windfarm site are summarised in **Table 3.1.**

Table 3.1 Morecambe offshore windfarm site overview

Area	Parameters	Values
Windfarm site	Area	87km^2
	Closest distance to shore	30km (approximate)
	Water depth	18-40m

23. The Agreement for Lease (AfL) area awarded by The Crown Estate spans 125km^2. Following consultation on the PEIR, the proposed windfarm site was reduced to approximately 87km^2, as further described in **Chapter 4 Site Selection and Assessment of Alternatives** (Document Reference 5.1.4).

3.2.2 Wind turbine generators

24. The WTG PDE is outlined in **Table 3.2** and illustrated in **Plate 3.1** and subsequently described, noting this considers both up to 30 'larger turbines and up to 35 'smaller turbines'.

25. The information presented in **Table 3.2** includes a range of WTGs with varying parameters and capacity, to accommodate the ongoing rapid development in WTG technology. Accounting for this range, there could be up to 30 'larger' or 35 'smaller' WTGs installed within the windfarm site to generate the nominal export capacity of 480MW.

Table 3.2 WTG design envelope

Parameter	Smaller WTGs	Larger WTGs
Maximum number of WTGs	35	30
Maximum rotor diameter (m)	260	280
Blade tip height (m) above highest astronomical tide (HAT)	290	310
Maximum hub height (m above HAT)	160	170
Minimum rotor clearance above sea level (m above HAT)	25[3]	
Indicative rotor speed range (rotations per minute (RPM))	8.42	7.09
Maximum rotor swept area for total windfarm site (km^2)	1.858	

[3] Equivalent to 34.56m above LAT; 26.07m above MHWS; 29.82m above mean sea level (MSL)

Parameter	Smaller WTGs	Larger WTGs
Minimum separation between WTGs (m) in-row	1,060	1,260
Minimum separation between WTGs (m) inter-row	1,410	1,680

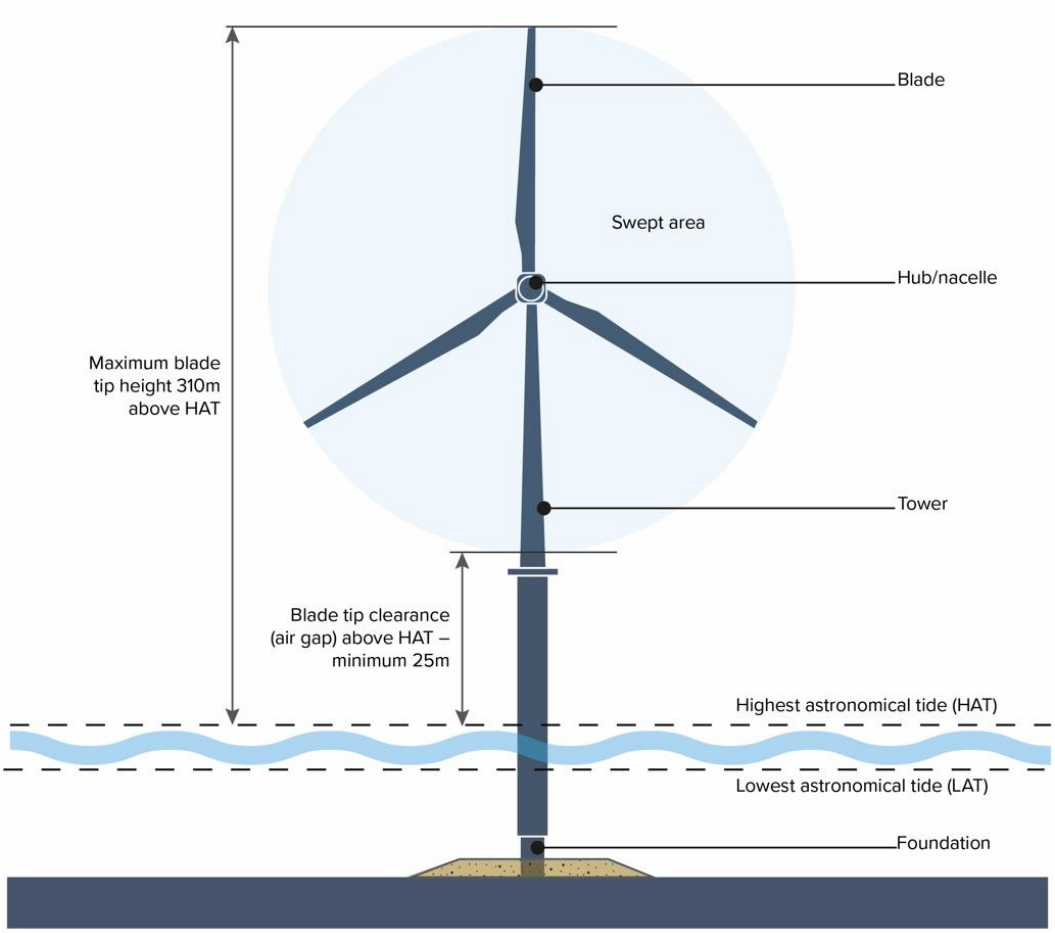


Plate 3.1 WTG schematic

26. The layout of WTGs would be finalised post-consent in consideration of design rules (as detailed in Marine Guidance Note (MGN) 654) and in consultation with relevant authorities e.g., MMO, Maritime and Coastguard Agency (MCA) and Trinity House (TH). The required lighting and navigational markings would also be agreed post-consent.

3.2.3 Offshore substations platform(s)

27. The Project would require up to a maximum of two OSP(s), depending on the electrical system voltage and final layout. The OSP(s) provide a centralised connection point for the inter-array cable circuits and contain primary electrical equipment and ancillary components that are required to transform the voltage

of the electricity generated at the WTGs to a higher voltage suitable for transporting power to the onshore electrical transmission network.

28. The OSP(s) would be situated within the windfarm site and would comprise the following components:

- Transformers
- Batteries
- Generators
- Switchgear
- Fire systems
- Modular facilities for operational and maintenance activities

29. The design of the OSP(s) would include a platform ‘topside’, supported above sea level on a foundation structure.

30. The typical deck plan of the OSP(s) would be a maximum of 50m by 50m, with the topsides comprising several layers/decks stacked on top of another, as required. **Plate 3.2** shows a schematic of a typical OSP.

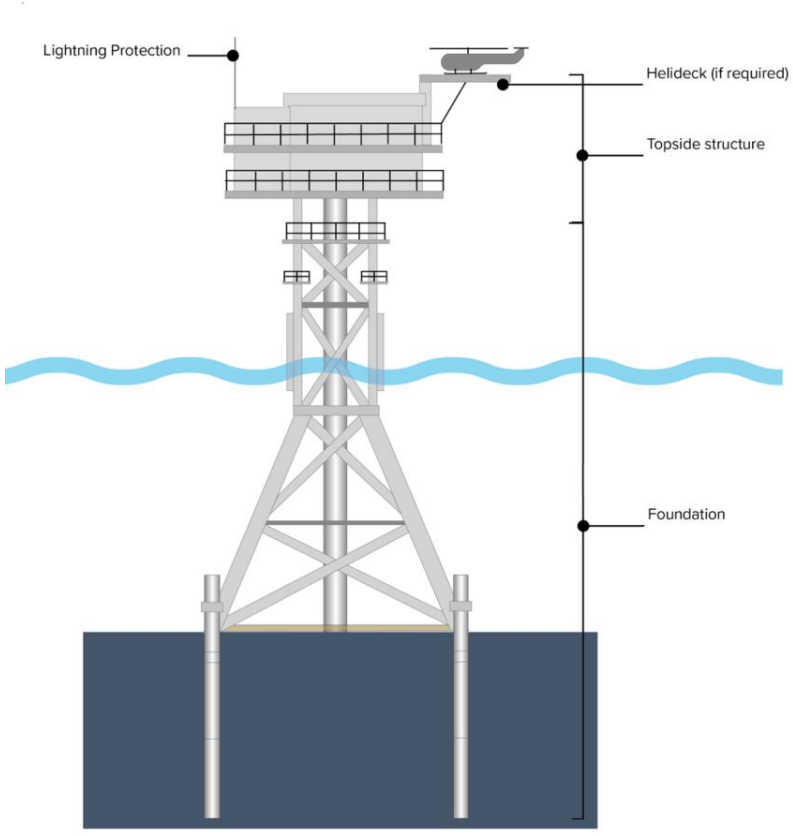


Plate 3.2 Schematic of an OSP. Note: The schematic shows a 'jacket on pin piles' foundation, however, the actual foundation type may differ e.g. monopile.

31. The topside design envelope for the OSP(s) is given in **Table 3.3.**

Table 3.3 OSP(s) topside design envelope

Parameter	Value
Maximum number of OSP(s)	2
Maximum topside width (m)	50
Maximum topside length (m)	50
Highest point of topside above HAT (m) (excluding helideck and lightning protection)	50
Highest point of topside above HAT (m) (including helideck and lightning protection)	70

3.2.4 Foundations

32. This section provides an overview of the foundations and substructures that are under consideration and assessed for the Project WTGs and OSP(s). The decision on the types of foundation and substructure to support the WTGs and OSP(s) would be made post-consent.

33. The WTG/OSP(s) foundation types and parameters are listed in **Table 3.4** and illustrated in **Plate 3.3**. Options are described in detail in **Chapter 5 Project Description** of the ES, and briefly described below:

- Gravity based structures (GBS). GBS usually comprise a base supporting a conical section, which tapers to an upper cylindrical section (shaft)
- Multi-legged pin-piled jacket (three-legged or four-legged jackets). A steel lattice construction (tubular steel and welded joints) secured to the seabed by hollow steel pin piles
- Monopile foundations are welded hollow tubular steel structures
- Multi-legged suction bucket jacket (three-legged jackets). A jacket that would be installed on three suction bucket ‘legs’

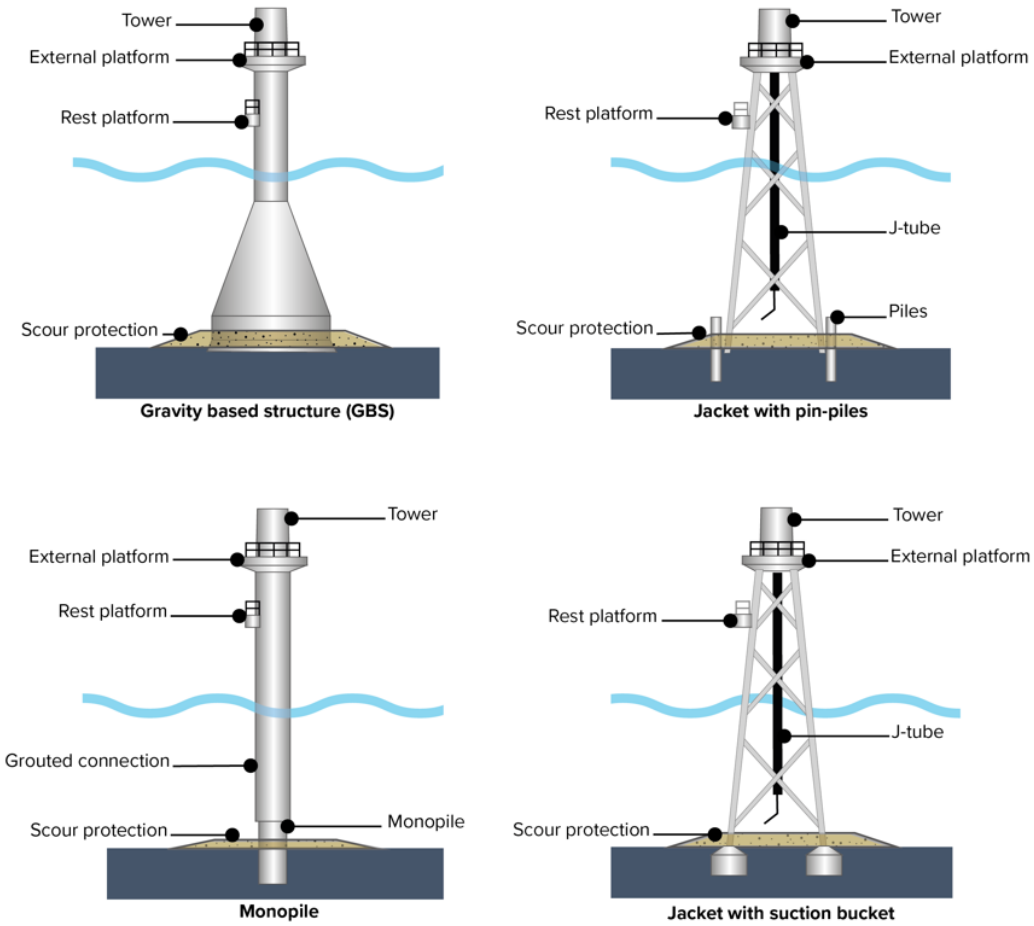


Plate 3.3 WTG/OSP foundation options

Table 3.4 Wind turbine foundation design envelope

Foundation types	Parameter	Maximum values
GBS	Maximum base slab diameter (m)	65
	Maximum cone bottom diameter (m)	55
	Maximum cone top/shaft diameter (m)	15
	Maximum cone height (m)	40
	Maximum footprint on the seabed per WTG/OSP[4] (m^2)	3,318
	Maximum footprint on the seabed for WTGs/OSP(s) (m^2)	122,766 ($116,130m^2$ for 35 WTGs[5] and $6,636m^2$ for 2 x OSPs)

[4] A circular base is assumed as a worst-case

[5] Noting that both smaller and larger WTGs have the same GBS foundation footprint.

Foundation types	Parameter	Maximum values
Multi-legged pin-piled jacket	Maximum legs per jacket foundation	4
	Maximum pile diameter (m)	3
	Maximum leg spacing at seabed (m)	35
	Maximum footprint on the seabed, pile-edge to pile-edge, per WTG/OSP (m^2)	28.5
	Maximum footprint on the seabed for total WTGs/OSPs (m^2)	1,055 ($998m^2$ for 35 x WTGs and $57m^2$ for 2 x OSPs)
	Maximum pile penetration depth (m)	56
Monopile	Maximum pile diameter (m)	12
	Maximum footprint on the seabed per WTG/OSP (m^2)	114
	Maximum footprint on the seabed for total WTGs/OSPs (m^2)	3,648 ($3,420m^2$ for 30 x WTGs and $228m^2$ for 2 x OSPs)
	Maximum pile penetration depth (m)	56
Multi-legged suction bucket jacket	Maximum legs per suction bucket (jacket) foundation	3
	Maximum bucket diameter (m)	20
	Maximum leg spacing at seabed (m)	35
	Maximum footprint on the seabed per WTG/OSP (m^2)	945
	Maximum footprint on the seabed for WTGs/OSPs (m^2)	34,965 ($33,075m^2$ for 35 x WTGs and $1,890m^2$ for 2 x OSPs

34. Foundation types would be selected following detailed design, based on suitability of the ground conditions, water depths and WTG/OSP(s) models or design. There may be only one type used, or a combination of foundation types may be used across the windfarm site.

3.2.5 Inter-array cables

35. Subsea inter-array cables would be installed to connect the individual WTGs and also connect the WTGs to the OSP(s).

36. Where possible, inter-array cables would be buried, with a target burial depth of 1.5m where ground conditions allow, and a burial range expected to be between 0.5m and 3m. Where cable burial is not possible, alternative cable protection measures could be used. This may include rock placement,

grout/sandbags, concrete mattresses, and polyethylene ducting. The appropriate level of protection would be determined based on an assessment of the risks posed to the Project in specific areas.

37. It is assumed that 10% of the inter-array cable length would require additional cable protection due to ground conditions. Protection would also be required at the entry points of each WTG and OSP(s) foundation, and at cable crossings. These are outlined in more detail in **Chapter 5 Project Description** of the ES.

38. The inter-array cables are expected to operate at 66kV or 132kV Alternating Current (AC). It is expected that 132kV AC cables may not be sufficiently ready or available, on an industry-wide level, for installation, but this higher voltage has been retained, pending further electrical studies.

39. The diameter of the inter-array cables may be up to 220mm. The design envelope for inter-array cables, crossings and entry to WTGs/OSP(s) is given in **Table 3.5**.

Table 3.5 Inter-array cable design envelope

Parameter	Value
Maximum length of inter-array cables (km)	70
Burial depth range (m)	0.5 – 3 (target burial depth of 1.5)
Maximum installation corridor disturbance width (m)	25
Unburied cable parameters	
Maximum height protection (m)	2
Maximum width protection (m)	13
Anticipated % cable unburied due to ground conditions[6]	10
Estimated total length of unburied cable due to ground conditions (km)	7
Cable protection at entry of cables to WTG/OSPs	
Number of entry points to WTGs and OSPs	70
Maximum length of cable protection required at each entry point (m)	50

[6] The percentage of cable that remains unburied due to ground conditions is dependent on the results of a cable burial survey. As such, 10% has been used a worst-case assumption.

Parameter	Value
Maximum length of protected cable (m)	3,500
Maximum width of rock berm protection at the bottom (m)	13
Maximum width at top of rock berm protection (m)	1

3.2.6 Platform link cables

40. Should the Project require two OSPs, then platform link cables would be required to connect each of the OSPs, to enable transfer of generated power from one OSP to the other, and to ensure that electricity transmission can continue in the event of one cable failing. The platform link cables are expected to operate at up to 275kV AC.

41. Cables may require protection where they cannot be buried due to ground conditions. Additionally, cables would require protection at cable crossings and at entry points to OSP(s). The exact requirements would be identified post-consent, prior to the start of construction, based on the final WTG and OSP locations and detailed site surveys.

42. The design envelope for the inter-array cables is given in **Table 3.6**.

Table 3.6 OSP(s) platform link cable and crossings design envelopes

Parameter	Value
General parameters	
Maximum number of cables	2
Maximum length of cable (per cable) (km)	5
Maximum number of cable trenches	2
Maximum total length of all cable trenches (km)	10
Burial depth range (m)	0.5 – 3 (target burial depth of 1.5)
Maximum installation corridor disturbance width (m)	25
Unburied cable parameters	
Maximum height protection (m)	2
Maximum width protection (m)	13

Parameter	Value
Anticipated % cable unburied due to ground conditions[7]	10
Estimated total length of unburied cable due to ground conditions (km)	1

3.2.7 Cable/pipelines crossings

43. It is anticipated that there could be up to nine cable/pipeline crossings required for inter-array cables, and up to six crossings for platform link cables within the windfarm site. Cable protection would be required at the crossings, **Table 3.7** (and is in addition to the cable protection requirements set out in **Table 3.6**).

Table 3.7 Cable/pipeline crossings design envelope

Parameter	Value
Maximum number of cable/pipeline crossings	15 (9 for inter-array cables, 6 for platform link cables)
Maximum cable/pipeline crossing height per crossing (m)	2.8
Maximum side slope	3:1
Maximum cable/pipeline crossing top width (m)	1
Maximum cable/pipeline crossing bottom width per crossing (m)	17.8
Maximum cable/pipeline crossing length per crossing (m)	250

3.3 Construction

44. Construction activities may include seabed preparation, unexploded ordnance (UXO) clearance[8], foundation installation (which may include pile driving and drilling), cable installation and deployment of cable protection and scour protection. The works would require a range of vessel types, including Dynamic Positioning (DP) and jack-up barges, which could require anchoring.

[7] The percentage of cable that remains unburied due to ground conditions is dependent on the results of a cable burial survey. As such, 10% has been used a worst-case assumption.

[8] Permissions for UXO removal would be sought in a future Marine Licence application and European Protected Species (EPS) licence post-consent.

45. Construction would typically be performed on a 24-hour basis, depending on suitable construction weather windows. During the construction phase, there would be 500m radius Safety Zones (as defined in the Energy Act 2004) around installation vessels, foundation structures, WTGs and OSP(s).

46. Offshore construction is anticipated over a two-and-a-half-year construction programme.

3.4 Operation and maintenance

47. During the operation and maintenance period, scheduled and unscheduled monitoring and maintenance of Project infrastructure would be required. During the Project life, it is likely that some refurbishment or replacement of offshore infrastructure would be required. Activities such as cable repair or reburial are also anticipated. All offshore infrastructure, including WTGs and OSP(s), foundations and cables would be included in monitoring and maintenance programmes (see **Chapter 5 Project Description** of the ES).

48. For this Screening Report, it was assumed the operational and maintenance duration would be 35 years from the date of commercial export, which would then be followed by decommissioning activities. The duration of the lease (with The Crown Estate) of the windfarm site is 60 years and, as such, repowering activities could be expected to extend the operations life. However, separate consent would be required for repowering and as such it is not considered in this report.

3.5 Decommissioning

49. At the end of the operational lifetime of the Project, offshore decommissioning would include the removal of all of the WTG and OSP(s) components and cutting of foundations to below seabed level. Cables, cable protection, some parts of the foundations and scour protection may be left *in situ*.

50. The detail and scope of the decommissioning works would be determined by the relevant legislation and guidance at the time of decommissioning and agreed with the regulator.

3.6 Transmission Assets

51. As described in **Section 1.1**, a separate DCO is being sought for the Transmission Assets for the Morecambe and Morgan projects. The key components of the Transmission Assets (as presented in the Transmission Asset PEIR (Morgan Offshore Wind Limited and Morecambe Offshore Windfarm Ltd (2023)) include:

- OSP(s) - to transform electricity generated by the Morgan and Morecambe Generation Assets to a higher voltage, allowing the power to be efficiently transmitted to shore from each windfarm site (noting

that the OSP(s) are also included in the Application for the Project and the Morgan Generation Assets[9])

- Interconnector cables (also known as platform link cables) - to connect OSP(s) within each windfarm site to each other
- Morgan offshore booster station – a potential mid-point reactive power compensation substation
- Offshore export cables – to link the Generation Assets of each windfarm site to the landfall site
- Landfall – where the offshore export cables are joined to the onshore cables
- Onshore export cables - to link the landfall with the onshore substations
- Onshore substations - substations (containing the components for transforming the power supplied via the onshore export cables) and associated grid connection infrastructure

52. The Transmission Assets PEIR Red Line Boundary (including both the offshore and onshore elements) is approximately 697.8km^2 in area. The offshore elements of the Transmission Assets are located in the Eastern Irish Sea. The offshore elements connect the Morgan and Morecambe array areas to the coast, south of Blackpool. The onshore elements of the Transmission Assets are located within the local authority areas of Fylde Council, Blackpool Council, South Ribble Borough Council, Preston City Council (and Lancashire County Council, at the County level).

4 The HRA Process

4.1 Legislative Context

53. The Conservation of Habitats and Species Regulations 2017 (2017 No. 1012) (as amended) and The Conservation of Offshore Marine Habitats and Species Regulations 2017 (2017 No. 1013) (as amended) are the principal pieces of secondary legislation which, prior to the UK's departure from the EU, transposed the terrestrial and offshore marine aspects of the EU Habitats Directive (Council Directive 92/43/European Economic Community (EEC)) and certain elements of the EU Wild Birds Directive (Directive 2009/147/European Commission (EC)) into the domestic law. Together, these regulations are collectively known as the "Habitats Regulations".

[9] At the time of writing the ES, a decision had been taken that the OSP(s) would remain solely within the Generation Assets application and would not be included within the Development Consent Order application for the Transmission Assets. This decision post-dated the PEIR that was prepared for the Transmission Assets. The OSP(s) are still included in the description of the Transmission Assets for the purposes of this document as the CEA carried out in respect of the Generation/Transmission Assets is based on the information available from the Transmission Assets PEIR.

54. The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 (2019 No. 579) set out the changes that apply now that the UK has left the EU. These confirmed that:

- All protected sites and species retain the same level of protection
- Among other things, the requirement for HRA to be undertaken continues to apply. Unless the UK Government implements further legislative changes, the obligations, process and terminology of the Habitats Regulations will, for the purposes of this document, remain as set out in existing legislation and regulations. The role of the EC is now taken by UK Ministers

4.1.1 European Sites (Post EU Exit)

55. The Europe-wide network of nature conservation areas that are the subject of the HRA process was established under the Habitats Directive. The Habitats Directive establishes a network of internationally important sites, designated for their ecological status. For EU member states (and formerly for the UK), SACs are designated under the Habitats Directive and promote the protection of flora, fauna and habitats. SPAs are designated under the Birds Directive to protect rare, vulnerable and migratory birds. European sites located within an EU Member State combine to create a Europe-wide network of designated sites (the Natura 2000 network) and may be referred to as Natura 2000 Sites.

56. Following the UK's exit from the EU, European sites located within the UK are no longer part of the Natura 2000 network (nor Natura Sites) but instead combine to form the UK's "National Site Network". The NSN comprises of European sites in the UK that already existed (i.e., were established under the Nature Directives) on 31st December 2020 (or proposed to the EC before that date) and any new sites designated under the Habitats Regulations under an amended designation process. Hereafter, sites within the UK and the EU are both referred to as European sites.

57. Ramsar Sites designated under the Convention on Wetlands of International Importance, especially as Waterfowl Habitat, as amended in 1982 and 1987 (the 'Ramsar Convention') are not included within the NSN but are still included within the HRA, as they remain protected in the same way as SACs and SPAs.

4.2 Policy and guidance

58. In addition to the legislation outlined above, all relevant guidance and policies have been considered during the development of the Information to Support HRA, including the following guidance:

- European Commission (2001): Assessment of Plans and Projects Significantly Affecting Natura 2000 Sites

- European Commission (2020): EU Guidance on wind energy development in accordance with EU nature directives
- PINS Advice Note Nine (2018): Rochdale Envelope
- PINS Advice Note Ten (2017): Habitat Regulations Assessment relevant to nationally significant infrastructure projects
- PINS Advice Note Seventeen (2019): Cumulative Effects Assessment
- Department of Energy and Climate Change (DECC) (2015): Guidelines on the Assessment of Transboundary effects of Energy Developments on Natura 2000 Sites outside the UK
- Ministry of Housing, Communities & Local Government (2019): Guidance on the use of Habitats Regulations Assessment
- Department for Environment, Food & Rural Affairs (Defra), Natural England, Welsh Government, and Natural Resources Wales (2021): Guidance; Habitats regulations assessments: protecting a European site; How a competent authority must decide if a plan or project proposal that affects a European site can go ahead
- Defra (2021): Best practice guidance for developing compensatory measures in relation to Marine Protected Areas (draft for consultation)
- Natural England's' Phase III Best Practice Advice for Evidence and Data Standards (Natural England, 2022)

59. Principles of the Round 4 Plan Level HRA have also been used as guidance in this Report (NIRAS, 2021a, as well as the Round 4 Plan Level Screening Results (NIRAS, 2021a).

4.3 The HRA process

4.3.1 Overview of HRA process

60. The Habitats Regulations place an obligation on 'competent authorities' to carry out an Appropriate Assessment (AA) of any proposal likely to affect a European site.

61. The HRA process is informed and assisted by the Applicant. It is the responsibility of the Applicant to include 'sufficient information' within the application to inform the HRA.

62. The HRA process consists of several phases, as further described below and within the Defra (2021) and the PINS Advice Note Ten guidance. For all plans and projects which are not wholly directly connected with, or necessary to, the conservation management of a European site's qualifying features, this will include formal screening for any LSE (either alone or in-combination with other plans or projects).

4.3.1.1 Stage 1 – HRA screening – this document

63. For all plans and projects which are not wholly, directly connected with, or necessary to, the conservation management of a site's qualifying features (such as the proposed Project), Stage 1 screening is required, as a minimum. In Stage 1, European sites are screened for LSE arising from the plan or project (either alone or in-combination with other plans or projects). Where it can be determined that there is no potential for LSE to occur to qualifying features of a site, that European site is sought to be 'screened out'. It is important to note that the burden of evidence is to show, on the basis of objective information, that there will be no LSE; if the effect may cause LSE, or is not known, this would trigger the need for an AA.

64. This document presents the screening assessment for the Project. Desk-based data collection, and relevant to marine mammals and ornithology the results of two years of monthly data from aerial surveys at the windfarm site and surrounding buffer zones, have been used to assess what can be screened out prior to undertaking Stage 2 (AA). The Applicant has sought advice from the appropriate bodies to inform this screening stage through the EPP process (as described in **Section 2**). This has sought to enable an efficient assessment by the competent authority for the Project.

65. In accordance with the 2018 European Court of Justice ruling in the case of People Over Wind, Peter Sweetman v Coillte Teoranta (C-323/17), mitigation, including embedded mitigation, has not been taken into account in Stage 1 screening.

66. The classes of designations considered within this HRA screening are:

- SCI - Once the EC approves the cSAC or cSPA it becomes a SCI, before the national government then designates it as a SAC or SPA
- SPAs (some of which are also Ramsar Sites)
- Potential pSPA) - SPAs that are approved by the UK Government but are still in the process of being classified
- SACs
- pSACs - A site which has been identified and approved to go out to formal consultation
- cSACs - Following consultation on the pSAC, the site is submitted to the EC or UK Ministers for designation and at this stage it is called a cSAC

67. Consideration is also given to effects on Ramsar Sites. Ramsar Sites protect wetland areas and extend only to "areas of marine water the depth of which at low tide does not exceed six metres".

4.3.1.2 Stage 2 – Appropriate Assessment

68. For those designated sites where LSE cannot be excluded in Stage 1, further information to inform the assessment is prepared. The assessment determined whether the project-alone or in-combination could adversely affect the integrity of the European site in view of its conservation objectives. The assessment and conclusions of this stage are reported in the form of a RIAA and the results of the assessment summarised in the form of a series of matrices.

4.3.1.3 Stage 3/4 –HRA Derogation

69. In cases where the competent authority concludes in the AA that an Adverse Effect on the Integrity (AEoI) of a European site cannot be ruled out beyond reasonable scientific doubt, consent should not be granted, unless the project satisfies each of the following tests:

- There are no feasible alternative solutions that would be less damaging or avoid damage to the site
- The proposal needs to be carried out for Imperative Reasons of Overriding Public Interest (IROPI)
- The necessary compensatory measures can be secured

4.4 Approach to HRA screening

70. HRA screening needs to determine whether the Project may have the potential for a significant effect on European sites and, therefore, if they will require an AA. Judgements regarding significance should be made in relation to the qualifying interests for which the site is designated as being of international importance for and the achievement of its conservation objectives. In considering whether the Project is likely to have a significant effect, or has the potential for a LSE on a European site, the following precautionary approach has been adopted during the screening process:

- The Project has been considered ‘likely’ to have a significant effect, if it is not possible (on the basis of objective information) to exclude the possibility that it could have significant effects on a European site or any of its qualifying features, either alone or in-combination with other projects or plans.
- An effect has been considered to be ‘significant’ in this context, if it is judged that it could undermine the achievement of the European site’s conservation objectives. This judgement has been made in the light of factors such as the characteristics and specific environmental conditions of the European site(s) in question.

- LSE is, in this context, any effect that may be reasonably predicted, as a consequence of the Project, which may affect the achievement of the conservation objectives of the features for which the European site was designated but excluding trivial or inconsequential effects. In determining significance, the assessment also takes note of the Waddenzee Ruling in which the European Court of Justice (Case C-127/02) stated *"…any plan or project not directly connected with or necessary to the management of the site is to be subject to an appropriate assessment of its implications for the site in view of the site's conservation objectives if it cannot be excluded, on the basis of objective information, that it will have a significant effect on that site, either individually or in-combination with other plans or projects*" [and that a plan or project may only be authorised] "*where no reasonable scientific doubt remains as to the absence of such effects*"
- In order to undertake the HRA screening, it is necessary to determine the range of likely effects that could arise as a result of the Project. This would then enable the distance and Zone of Influence (ZoI) of the potential effects to be identified, within which the relevant designated sites should then be considered. The ZoI has been determined on the basis of the potential range of physical disturbances, the nature of the habitats present and their ability to support species that are a designated feature of sites in the area.

71. The HRA screening approach is based on a conceptual source-pathway-receptor model. For different receptors, including highly mobile species, such as marine mammals and birds, the approach is described in the sections below (**Sections 5-8**), but follow three main criteria for the initial identification of European Sites:

- The Project overlaps with one or more European or Ramsar Site(s)
- European or Ramsar Site(s) with qualifying mobile features/species (e.g. Annex I birds, Annex II marine mammals, migratory fish) whose range (e.g. foraging, migratory, overwintering, breeding or natural habitat range) overlaps with the Project
- European or Ramsar Site (s) and/or qualifying interest features located within the potential ZoI associated with the Project (e.g. habitat loss/disturbance, noise and risk of collision)

72. It is noted that no pathway has been established for terrestrial ecology, given the distance of the Project windfarm site to the coast (30km). Further, no European sites are considered in relation to bats because the species for which sites are designated in the UK are considered to be sedentary. Migration of bats from European sites in other EU Member States is likely to be diffuse across a broad front, with individuals dispersing widely across the UK; hence, the absence of European sites in the UK designated for migratory species.

73. A separate HRA screening report is being produced for the Transmission Assets, alongside the EIA for the associated coordinated Transmission Assets of both the Morgan Offshore Wind Project and the Morecambe Offshore Windfarm. The Transmission Assets have been considered in this HRA screening process for potential in-combination effects with the Project (as described in **Section 4.4**).

74. Screening for the plan-level HRA of the Offshore Wind Leasing Round 4 (NIRAS, 2021a), of which the Project forms a part, and associated RIAA (NIRAS, 2021b), were also reviewed. However, it should be noted that the approach to screening at the plan-level may not be appropriate at the project level, and therefore the HRA screening set out in this report has been undertaken independently of conclusions of the Round 4 plan-level HRA.

75. Nonetheless, and in addition to the standardised pressures defined in the Natural England's' Phase III Best Practice Advice for Evidence and Data Standards (Natural England, 2022), the Project HRA screening has taken into account the Potential Impact Pathways (PIP) identified in the Round 4 plan-level HRA:

- P1 Habitat Loss/Gain – considered as part of direct habitat effects and secondary effects via prey species and prey habitats
- P2 Direct Physical damage – considered as part of direct habitat effects and secondary effects on prey species and prey habitats
- P3 Indirect Physical Damage – considered as part of indirect habitat effects and secondary effects on prey species and prey habitats
- P4-P6 Collision – considered as collision risk for birds
- P7 Physical Presence – considered as part of disturbance/displacement
- P8 Underwater Noise – considered part of direct effects to marine mammals and fish and secondary effects on prey species and habitats of prey
- P9 Above Water noise – considered as part of disturbance/displacement
- P10 Toxic Contaminants – considered as part of effects to benthic and fish species and considered part of secondary effects on prey species and habitats of prey
- P11 Electromagnetic Fields (EMF) – considered as part of effects to benthic features, fish and marine mammals and secondary effects on prey species and habitats of prey
- P12 Light – considered as part of disturbance/displacement
- P13 Temperature – considered in changes to water quality and part of secondary effects on prey species and prey habitats
- P14 Suspended Sediments – considered as indirect effects to benthic features, marine mammals and fish and part of secondary effects on prey species and prey habitats

- P15 Invasive Species – considered as effects to benthic habitats as part of secondary effects on prey species and prey habitats

4.4.1 Assessment of LSE

76. Following the identification of the distance within which to identify the European sites that should be considered in this screening, the consideration of whether the likely effects would be trivial or inconsequential was then undertaken. For the purposes of this screening exercise, three categories of LSE are defined and have been utilised, as follows:

- No LSE – based on the information that is currently available on the baseline environment, the activities proposed and their predicted effects, it is considered that there will be no LSE with respect to the identified feature and site
- Potential for a LSE – based on information available, the possibility of a LSE cannot be ruled out
- LSE – based on information available it is apparent that the project activities could have an impact upon designated features and could lead to significant adverse temporary or long-term change, therefore leading to a LSE

4.4.2 Assessment in relation to sites' conservation objectives

77. Judgements of LSE need to be based upon assessment of potential effects on the features for which the European site was designated and taking into account their conservation objectives.

78. The conservation objectives set out what is needed to ensure favourable condition of the designated feature. The term 'favourable condition' is used for the desired status of the interest features of an individual SAC/SPA. Conservation objectives are used as the basis from which management measures and monitoring programmes may be developed for the designated sites. Conservation objectives are also utilised to inform AA under the Habitats Regulations and, in this respect, it is important to ensure that the assessment of potential Project effects is undertaken with reference to available site objectives.

79. In order to deal with the large number of sites being assessed for LSE, a generic set of conservation objectives that typically apply to the types of features (Annex I habitats, Annex II species populations and SPA designated bird populations) have been used as a reference against which to determine whether LSE may arise. This approach also enables cSACs and pSPAs, for which conservation objectives will not have been developed, to be screened. These objectives are as follows:

80. For SAC Annex I habitats and associated communities:

- Subject to natural change, maintain/restore the feature in/to favourable condition, such that the:
  - Natural environmental quality is maintained
  - Natural environmental processes are maintained
  - The extent, physical structure, biodiversity, community structure and typical species representative of the feature are maintained/restored

81. For SAC Annex II species populations:

- Subject to natural change, maintain in favourable condition the species feature. Favourable condition for migratory/mobile species is normally based upon ensuring that specific conditions are met. These conditions relate to maintenance of migratory passage, population size, abundance/presence of prey species and other environmental parameters (e.g. water quality) where this may affect the designated features/populations.

82. For designated bird populations of SPAs/Ramsar Sites:

- Overall, it can be stated that the SPA conservation objective is aimed at maintaining bird populations, or the diversity of species within a defined assemblage, through the protection of habitats supporting them and management against negative effects of disturbance. In respect of favourable condition, two key attributes of bird features are applied – population size of individual species, or groups of species, and extent of habitats used by the birds in the site for nesting, roosting, feeding etc. Attributes relating to the maintenance of habitat quality (e.g., food availability) and preventing/managing activities that may cause disturbance to designated populations are also generally applied.

4.4.3 Screening for LSE

83. Consideration of the potential effects of the Project in relation to the above objectives for the screened features listed (site by site) has been undertaken at a high level and the outcomes are described in subsequent sections (**Sections 5-8**) under three categories of sites and features:

- SACs that contain coastal or offshore habitat interest features and/or non-mobile species interest features and SPA/Ramsar Sites containing habitats supporting bird interest features
- SACs designated for mobile species populations (e.g., migratory fish, marine mammals)
- SPAs and Ramsar Sites designated for bird populations

4.4.4 Consideration of in-combination effects

84. The Habitats Regulations require that the potential effects of a project on designated sites are considered both alone and in-combination with other plans or projects.

85. In-combination effects relate to 'the combined action of different environmental topic-specific impacts upon a single resource/receptor'. Also considered within screening are interactions, 'the effect of similar impacts from multiple schemes on the same receptor'.

86. It is therefore necessary to identify other plans or projects including those advised in the PINS Advice Note Ten:

- Projects that are under construction
- Permitted application(s) not yet implemented
- Submitted application(s) not yet determined
- All refusals subject to appeal procedures not yet determined
- Projects on the PINS Programme of Projects
- Projects identified in the relevant development plan (and emerging development plans – with appropriate weight being given as they move closer to adoption) recognising that information on any relevant proposals will be limited and the degree of uncertainty which may be present.

87. The assessment presents relevant in-combination effects of projects using the three-tiered approach, as devised in PINS Advice Note Seventeen (PINS, 2019).

Tier 1

- Under construction
- Permitted application(s), whether under the Planning Act 2008 or other regimes, but not yet implemented
- Submitted application(s) whether under the Planning Act 2008 or other regimes but not yet determined

Tier 2

- Projects on the PINS's Programme of Projects where a Scoping Report has been submitted

Tier 3

- Projects on the PINS's Programme of Projects where a Scoping Report has not been submitted
- Identified in the relevant Development Plan (and emerging Development Plans – with appropriate weight being given as they move closer to

adoption) recognising that there will be limited information available on the relevant proposals

- Identified in other plans and programmes (as appropriate) which set the framework for future development consents/approvals, where such development is reasonably likely to come forward

88. Only projects which are reasonably well described and sufficiently advanced to provide information on which to base a meaningful and robust assessment have been included in the in-combination assessment. Projects classified under Tiers 1 and 2 are included in the HRA screening. Tier 3 have been considered to the extent that the available data allows meaningful consideration.

89. Plans or projects that may be considered include (but are not limited to) other OWFs, other renewables developments, aquaculture, aggregate extraction and dredging, licenced disposal sites, shipping and navigation, planned construction of sub-sea cables and pipelines, potential port/harbour development, oil and gas development and operation, including seismic surveys and UXO clearance.

90. Currently there are several projects either in concept early planning, consenting stages or early construction within the Irish Sea. **Table 4.1** provides a list of plans or projects with a potential for in-combination effects given potential temporal and spatial overlap of activities that are considered in the screening.

Table 4.1 Plans and projects relevant to the in-combination assessment

Plan or project	Consideration
Mona Offshore Wind Project	Potential in-combination effects on Annex I habitats and Annex II species with temporal overlap of construction activities possible.
Morgan Offshore Wind Farm	Potential in-combination effects on Annex II species and Annex 1 habitats with temporal overlap of construction activities possible.
Isle of Man Interconnector (cable protection remedial works)	Potential in-combination effects on Annex 1 habitats with temporal overlap of construction activities possible.
Awel y Môr (AyM) OWF	Potential in-combination effects on Annex II species and Annex I habitats species with temporal overlap of construction activities possible.
Isle of Man Interconnector	Potential in-combination indirect effects on Annex I habitats and Annex II species
Barrow D disposal site	Potential in-combination indirect effects on Annex I habitats and Annex II species

Plan or project	Consideration
Morecambe Lune Deep disposal site	Potential in-combination indirect effects on Annex I habitats and Annex II species
Morecambe Bay B disposal site	Potential in-combination indirect effects on Annex I habitats and Annex II species
Liverpool Bay Aggregate Production Area	Potential in-combination indirect effects on Annex I habitats and Annex II species
Disposal sites Z and Y	Potential in-combination indirect effects on Annex I habitats and Annex II species
Morgan and Morecambe: Transmission Assets	Potential in-combination effects on Annex II species and Annex 1 habitats with temporal overlap of construction activities possible.
Operational wind farms	Consideration given to operational projects within 30km for operational and maintenance activities as well as, for ornithology, on the western seaboard for ornithological collision risk. Given the distances of operational windfarms from screened in European Sites, maintenance activities are not considered to produce in-combination effects.
Preesall gas storage project	Potential in-combination effects on ornithological features designated as part of the Liverpool Bay SPA.
Moori Vannin (Isle of Man windfarm)	No pathway for benthic effect given distance and for fish and marine mammals (construction impacts) the scoping report for the project identifies a offshore construction period after that of the Project, so no overlap. There is insufficient detail from Moori Vannin upon which to base an ornithological assessment. As such this project has not been quantified in the in-combination assessment.

91. Consultation during the EIA and HRA processes has determined the projects or plans with the potential for cumulative effects to be identified and considered.

5 Benthic Ecology (Annex I habitats)

5.1 Approach to screening

93. Direct or indirect effects on habitats and sites which have Habitats Directive Annex I benthic habitats as a qualifying feature have been considered for HRA screening. Potential effects may arise from the permanent or temporary physical presence or activities relating to the construction, operational and maintenance or decommissioning of the Project.

94. This HRA screening exercise considered sites that met the following criteria:

- A component of the proposed project directly overlaps a site whose qualifying features include benthic habitats
- The distance between the proposed project and the offshore habitat qualifying feature is within the range for which there could be an interaction (i.e. within a ZoI for a physical process change resulting from the Project)

5.2 Potential effects considered in screening

95. Within the windfarm site, construction activities, such as the installation of foundations, cables and ancillary structures, associated seabed preparation works, and the placement of jack-up vessel legs, could cause direct physical disturbance and indirect disturbance through the elevation of suspended sediment.

96. Operation of the Project would create persistent effects (i.e. for the lifespan of the proposed project) or permanent effects (i.e. where infrastructure is not removed during decommissioning), through the loss of existing habitat and introduction of new substrate, such as rock or concrete mattresses used as cable and foundation scour protection, cable crossings as well as the foundation structures themselves.

97. There is no overlap of the windfarm site with any European sites and, therefore, there is no potential for direct effects (which include electromagnetic effects, physical disturbance and habitat loss and the physical presence of infrastructure) which are consequently screened out for construction, operation and maintenance, and decommissioning.

98. There is however the potential for indirect effects, which are screened in for construction, operation and maintenance, and decommissioning (including increased suspended sediment concentrations (SSCs) and subsequent deposition, remobilisation of contaminated sediments and risk of deterioration of water quality due to spillages/leakages). Other temporary effects identified during operation would be caused by maintenance activities such as the use of jack-up vessels and the replacement and repair of any cables.

99. Activities resulting in interaction with the seabed may release sediment into the water column, resulting in increased suspended sediments and changes to seabed levels. Existing contaminants that may be contained within the surface sediments may be re-mobilised by construction activity. This has the potential to impact on benthic communities should benthic sediment feeders and filter feeders ingest and uptake released contaminants, which could subsequently enter the food chain and may accumulate in predatory species. Due to the level of vessel activity, there is also potential for introduction and colonisation of non-native species as secondary effects via dispersal.

100. Annex I habitats, for which habitats sites are designated, are not known to have any noise sensitivity. These include:

- Sandbanks which are slightly covered by sea water all the time
- Estuaries
- Mudflats and sandflats not covered by seawater at low tide
- Coastal lagoons
- Reefs
- Large shallow inlets and bays
- Submarine structures made by leaking gases
- Submerged or partially submerged sea caves

101. As a result, effects of EMF and underwater noise have been screened in relation to Annex I habitats.

102. Decommissioning effects would be primarily caused by the removal of structures from the seabed. Decommissioning would be expected to cause similar effects to those identified during construction.

103. The potential effects on benthic habitats from the Project have been identified as shown in **Table 5.1**.

Table 5.1 Summary of the potential effects of the Project on benthic ecology receptors considered in HRA screening (screened in (✓) and screened out (X))

Potential effect	Construction	Operation and maintenance	Decommissioning
Physical disturbance and habitat loss	x	x	x
Physical presence of infrastructure (change in habitat type)	x	x	x
Increased SSCs and subsequent deposition	✓	✓	✓
Remobilisation of contaminated sediments	✓	✓	✓

Potential effect	Construction	Operation and maintenance	Decommissioning
Underwater noise and vibration	x	x	x
Interactions with EMF	x	x	x
Introduction and colonisation of non-native species	✓	✓	✓
Risk of deterioration of water quality due to spillages/leakages	✓	✓	✓
In-combination effects	✓	✓	✓
Transboundary effects[10]	x	x	x

5.3 Baseline information

104. The windfarm site is characterised by water depths between 18m and 40m deep and by the following main benthic habitats based on broadscale mapping:

- Offshore circalittoral sand (SS.SSa.OSa)
- Offshore circalittoral mud (SS.SMu.OMu)
- Circalittoral sandy mud (SS.SMu.CSaMu)

5.4 Identification of sites and features

105. The potential for LSE would be dependent on the characteristics of the habitats and communities (receptors) present within the footprint of the impact and, in particular, the capacity of the affected communities to recover from those effects identified.

106. Based on evidence from other OWF EIAs, the range of indirect effects, such as sediment plume dispersal, is likely to be limited to a few kilometres from the source. Tidal excursion data demonstrates a maximum ZoI of 10km at the windfarm site. In order to provide a highly conservative screening process, with consideration of potential in-combination interactions, habitats sites within 50km of the windfarm site have been considered.

5.5 Screening

107. **Table 5.1** provides the list of European sites within a 50km search area which have Annex I features as a primary or secondary reason for designation.

[10] Screened out as none within 50km area of search (see **Section 5.4**)

Figure 5.1 also shows the SACs within a 50km search area which have Annex I benthic features as a primary or secondary reason for designation.

108. Following a review of the area of search, a ZoI has been analysed, based on an understanding of the tidal regime overlapping the Project windfarm site. The ZoI is based on the understanding that effects arising from WTG and substation platform foundations and cables are relatively small in magnitude, and localised, with a 15km ZoI encompassing direct and indirect effects to benthic and fish habitat (with the exception of noise). 15km covers in excess of a typical tidal excursion and also reflects the distance used in the Round 4 plan level HRA screening (NIRAS, 2021a) which is relevant for fish and benthic habitats. Analysis of ABPmer tidal ellipse data identifies a spring tidal excursion of approximately 10km in an east-west orientation at the windfarm site (ABPmer, 2021).

109. No European Sites overlap with the windfarm site and as such indirect effects only were screened in.

110. In addition, the RIAA includes consideration of effects on the supporting habitats for ornithology, where appropriate. The Liverpool Bay SPA and Ribble & Alt Estuaries SPA border the windfarm site, so the potential pathway of effects on benthic ecology to impact upon food source for the designated features of the SPAs has been considered in the RIAA.

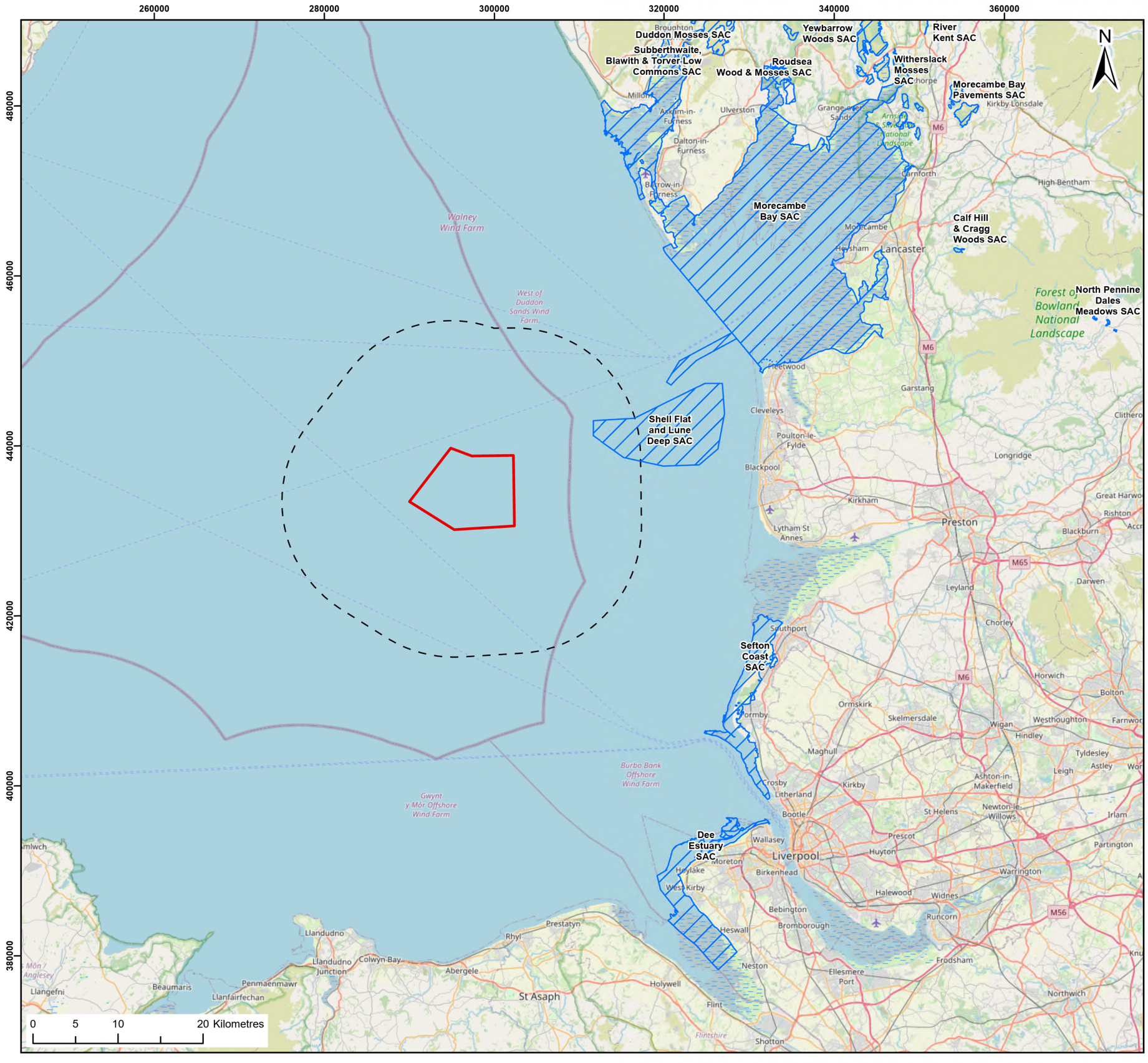
Table 5.2 SACs designated for Annex I habitats - screening summary

Site Code	Country	Designation name	Qualifying feature	Distance from development at its closest point	Significance of effect (alone or in-combination)	Rationale
UK0030376	England	Shell Flat and Lune Deep SAC	1110 Sandbanks which are slightly covered by sea water all the time (Shell Flat)	9.69km	Potential for a LSE (Screened in)	Within the range of potential impact for indirect effects, alone and in-combination (a precautionary 15km tidal excursion and the distance used in the plan level HRA principals (NIRAS, 2021a).
			1170 Reefs (Lune Deep)	18km	No LSE (Screened out)	No pathway for LSE between these habitats and the Project's activities. Beyond the range of potential effects (given the conservative range of 15km for suspended sediments encompasses the 10km tidal ellipse at the windfarm site) alone and no

Site Code	Country	Designation name	Qualifying feature	Distance from development at its closest point	Significance of effect (alone or in-combination)	Rationale
						in-combination effects identified.
UK0013027	England	Morecambe Bay SAC	1130 Estuaries 1140 Mudflats and sandflats not covered by seawater at low tide 1160 Large shallow inlets and bays 1220 Perennial vegetation of stony banks 1310 Salicornia and other annuals colonizing mud and sand 1330 Atlantic salt meadows *Glauco-Puccinellietalia maritimae* 2120 "Shifting dunes along the shoreline with *Ammophila arenaria* (“white dunes”)" 2130 "Fixed coastal dunes with herbaceous vegetation (“grey dunes”)" 2190 Humid dune slacks 1166 Great crested newt	29.08km	No LSE (Screened out)	No pathway for LSE between these habitats and the Project’s activities, given a distance over 15km. Beyond the range of potential effects alone and no in-combination effects identified.
UK0013076	England	Sefton Coast SAC	2110 Embryonic shifting dunes	30.48km	No LSE (Screened out)	No pathway for LSE between these habitats and

Site Code	Country	Designation name	Qualifying feature	Distance from development at its closest point	Significance of effect (alone or in-combination)	Rationale
			2120 "Shifting dunes along the shoreline with *Ammophila arenaria* (“white dunes”)" 2130 "Fixed coastal dunes with herbaceous vegetation (“grey dunes”) 2170 Dunes with *Salix repens ssp. argentea Salicion arenariae* 2190 Humid dune slacks 1395 Petalwort *Petalophyllum ralfsii*			the Project’s activities. Beyond the range of potential effects alone and no in-combination effects identified.
UK0030131	England/Wales	Dee Estuary SAC	1140 Mudflats and sandflats not covered by seawater at low tide 1310 Salicornia and other annuals colonizing mud and sand 1330 Atlantic salt meadows *Glauco-Puccinellietalia maritimae*	42.28km	No LSE (Screened out)	No pathway for LSE between these habitats and the Project’s activities. Beyond the range of potential effects alone and no in-combination effects identified.
UK0030202	Wales inshore	Y Fenai a Bae Conwy/Menai Strait and Conwy Bay	1110 Sandbanks which are slightly covered by sea water all the time 1140 Mudflats and sandflats not covered by seawater at low tide	43.91km	No LSE (Screened out)	No pathway for LSE between these habitats and the Project’s activities.

Site Code	Country	Designation name	Qualifying feature	Distance from development at its closest point	Significance of effect (alone or in-combination)	Rationale
			1170 Reefs 1160 Large shallow inlets and bays 8330 Submerged or partially submerged sea caves			Beyond the range of potential effects alone and no in-combination effects identified.



Legend:

- Morecambe Offshore Windfarm Site
- Morecambe Offshore Windfarm Site 15km buffer

Designated site

- Special Areas of Conservation (SAC)

Report: Morecambe Offshore Windfarm: Generation Assets HRA Screening

Title: SACs considered in the HRA Stage 1 assessment in relation to Benthic Ecology

Figure: 5.1 | Drawing No: PC1165-RHD-ZZ-OF-DR-Z-0086

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
P01	12/05/2022	JT	SB	A3	1:450,000
P02	12/05/2022	JH	SB	A3	1:450,000

Co-ordinate system: WGS 1984 UTM Zone 30N

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111. The Shell Flat and Lune Deep SAC contains Annex I sandbanks and Annex I reefs (noting the reef is outside the ZoI and screened out). The site is characterised by a deep water channel (Lune Deep) and a large sandbank feature (Shell Flat), surrounded by shallower areas to the north and south.

112. It was not possible to rule out LSE on the Shell Flat Lune Deep SAC (Shell Flat part only, with Lune Deep beyond the ZoI) during Stage 1 (screening), therefore information to inform Stage 2 (AA) is required for this site.

113. As there is no physical overlap between the windfarm site and the Shell Flat and Lune Deep SAC, there is no pathway for direct effects to occur, therefore direct effects during construction, operation and maintenance and decommissioning for these SACs were screened out of the Stage 2 assessment, however, the following indirect effects have been considered:

- Increased SSCs
- Smothering due to increased suspended sediment
- Re-mobilisation of contaminated sediments and changes to water quality
- In-combination effects

6 Fish Ecology (Annex II species)

6.1 Approach to screening

114. Direct or indirect effects on Annex II migratory fish species may arise from the permanent or temporary physical presence or activities relating to the construction, operation or decommissioning of the windfarm and associated infrastructure. Potential effects include loss of habitat, disturbance and displacement.

115. This HRA screening exercise considers sites which meet the following criteria:

- The windfarm site directly overlaps a site whose qualifying features includes an Annex II migratory fish species
- The distance between the windfarm site and a site with a fish qualifying feature is within the range for which there could be an interaction e.g. the distance of the site from the source of suspended sediment from the windfarm site is within the range at which sediment deposition could occur
- The distance between the windfarm site and resources on which the qualifying feature depends (i.e., an indirect effect acting though prey or access to habitat) is within the range for which there could be an interaction
- The likelihood that a foraging area or a migratory route occurs within the windfarm site

6.2 Potential effects considered in screening

116. The key factors that were considered during the HRA screening process are:

- Potential effects (source)
- Proximity of source to feature (distance between the proposed development and SACs, migration routes) (pathway and receptor)

117. During construction of the Project, activities which result in disturbance to the seabed and the generation of suspended sediment have the potential to disturb and displace fish from supporting habitats or migratory routes. Underwater noise generated by construction activities, such as piling, also has the potential to displace fish from supporting habitats or migratory routes by acting as a barrier.

118. During the operational period, the physical presence of turbine foundations and associated components (offshore platforms and array cables) would result in some loss or replacement of existing habitats. Maintenance activities during the operational phase may also result in localised disturbance or displacement of habitats and potentially EMF effects along with underwater noise.

119. Decommissioning would require the removal of foundation structures and either the cutting or removal of subsea cables resulting in physical disturbance, potential disturbance and displacement effects associated with suspended sediment and underwater noise. Effects caused during decommissioning would be similar to those during the construction phase.

120. The potential effects on fish from the Project have been identified and provided in **Table 6.1**. These are potential effects which could affect a receptor (site or feature) if there is a pathway.

Table 6.1 Summary of potential effects on fish ecology considered in HRA screening (screened in (✓) and screened out (X))

Potential effect	Construction	Operation and maintenance	Decommissioning
Temporary habitat loss/physical disturbance	✓	✓	✓
Permanent habitat loss	x	✓	x
Increased suspended sediments and sediment re-deposition	✓	✓	✓
Remobilisation of contaminated sediments	✓	✓	✓
Underwater noise and vibration	✓	✓	✓
EMF	x	✓	x

Potential effect	Construction	Operation and maintenance	Decommissioning
Barrier effects	✓	✓	✓
Introduction/removal of hard substrate	x	✓	✓
In-combination effects	✓	✓	✓
Transboundary effects	✓	✓	✓

6.3 Baseline information

121. A number of Annex II migratory fish species, such as Atlantic salmon *Salmo salar*, may pass through the windfarm site, however, migratory pathways are still relatively unknown. Anadromous species recorded from rivers and estuaries (Dee, Morecambe Bay, Conwy and Solway Firth) in the Eastern Irish Sea include allis shad *Alosa alosa*, twaite shad *Alosa fallax* and sea lamprey *Petromyzon marinus* and the catadromous river lamprey *Lampetra fluivatilis*.

6.4 Identification of sites and features

122. Based on evidence from other OWF EIAs, the range of indirect effects such as sediment plume dispersal is likely to be limited to a few kilometres from the source. However, in order to provide a highly conservative screening process, this exercise considered all SACs on the west coast of England and Wales, and southern Scotland, as well as the east coast of Ireland and Northern Ireland, which have migratory fish species listed in Annex II of the Habitats Directive as a qualifying feature given the potential range of qualifying species.

6.5 Screening

123. **Table 6.2** provides the list of SACs which have migratory fish species listed in Annex II of the Habitats Directive as a qualifying feature considered in screening. The SACs are also shown in **Figure 6.1**.

124. Disturbance to supporting habitats, due to installation of infrastructure or due to temporary works, would be localised within the windfarm site. Sediment plumes and changes to seabed characteristics are expected to be restricted to the vicinity of the windfarm site. As stated in **Section 5.4,** increased suspended sediments levels are expected to be localised to the windfarm site, however, a conservative 15km buffer has been considered at this stage. 15km covers in excess of a typical tidal excursion.

125. For underwater noise effects, a ZoI of 50km is used, which is a conservative estimate of the range of noise effects to fish. As a worst-case scenario, considering herring, as a noise sensitive species, and pile driving, which is considered one of the noisiest construction activities, results from underwater

noise modelling for the Project has found worst case temporary threshold shifts in hearing for herring (as a stational receptor) is within 50km. This is in line with modelling undertaken for existing offshore wind projects. Therefore, a ZoI of 50km encompasses potential effects to fish from noise.

126. Given the mobile nature of Annex II migratory fish, and due to the potential interaction of the Project and fish outwith the SACs, sites for migratory species within 100km, or where a pathway potentially exist, have been considered.

127. European sites beyond 100km, where there is no pathway, have been screened out, which reflects the coastal orientation, migratory movements and the level of dispersal expected beyond this range.

128. As a result, the sites screened in (AA) are:

- Dee Estuary/Aber Dyfrdwy SAC
- River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC
- Afon Gwyrfai a Llyn Cwellyn SAC
- Afon Eden - Cors Goch Trawsfynydd SAC
- Solway Firth SAC
- River Ehen SAC
- River Eden SAC
- River Derwent and Bassenthwaite Lake SAC

129. No effects are expected to other SACs and, considering the distance from the windfarm site and orientation of SAC's designated for Annex II migratory fish (**Figure 6.1**), there would be a negligible impact at any population scale.

Table 6.2 SACs with Annex II migratory fish - screening summary

Site Code	Country	Designation name	Qualifying feature	Distance from development at its closest point	Significance of effect (alone or in-combination)	Rationale
UK0030131	England/Wales	Dee Estuary/Aber Dyfrdwy SAC	1095 Sea lamprey 1099 River lamprey	42.28km	Potential for a LSE (Screened in)	Species range may overlap with the Project's activities. Potential for effects alone and in-combination.
UK0030252	England/Wales	River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid	1106 Atlantic salmon 1095 Sea lamprey 1099 River lamprey	64.76km	Potential for a LSE (Screened in)	Species range may overlap with the Project's activities. Potential for effects alone and in-combination.
UK0030057	England	River Ehen SAC	1106 Atlantic salmon 1095 Sea lamprey 1099 River lamprey	74.23km	Potential for a LSE (Screened in)	Species range may overlap with the Project's activities. Potential for effects alone and in-combination.
UK0030032	England	River Derwent and Bassenthwaite Lake SAC	1106 Atlantic salmon 1095 Sea lamprey 1099 River lamprey	74km	Potential for a LSE (Screened in)	Species range may overlap with the Project's activities. Potential for effects alone and in-combination.

Site Code	Country	Designation name	Qualifying feature	Distance from development at its closest point	Significance of effect (alone or in-combination)	Rationale
			1096 Brook lamprey			
UK0030046	Wales	Afon Gwyrfai a Llyn Cwellyn SAC	1106 Atlantic salmon	81.87km	Potential for a LSE (Screened in)	Species range may overlap with the Project's activities. Potential for effects alone and in-combination.
UK0030075	Wales	Afon Eden Afon Eden - Cors Goch Trawsfynydd SAC	1106 Atlantic salmon	97.59km	Potential for a LSE (Screened in)	Species range may overlap with the Project's activities. Potential for effects alone and in-combination.
UK0013025	England/Scotland	Solway Firth SAC	1095 Sea lamprey 1099 River lamprey	107.33km	Potential for a LSE (Screened in)	Species range may overlap with the Project's activities. Potential for effects alone and in-combination.
UK0012643	England	River Eden SAC	1106 Atlantic salmon 1095 Sea lamprey 1099 River lamprey	84.62km (noting this straight line distance crosses land and this site is upstream of the Solway Firth over	Potential for a LSE (Screened in)	Species range may overlap with the Project's activities. Potential for effects alone

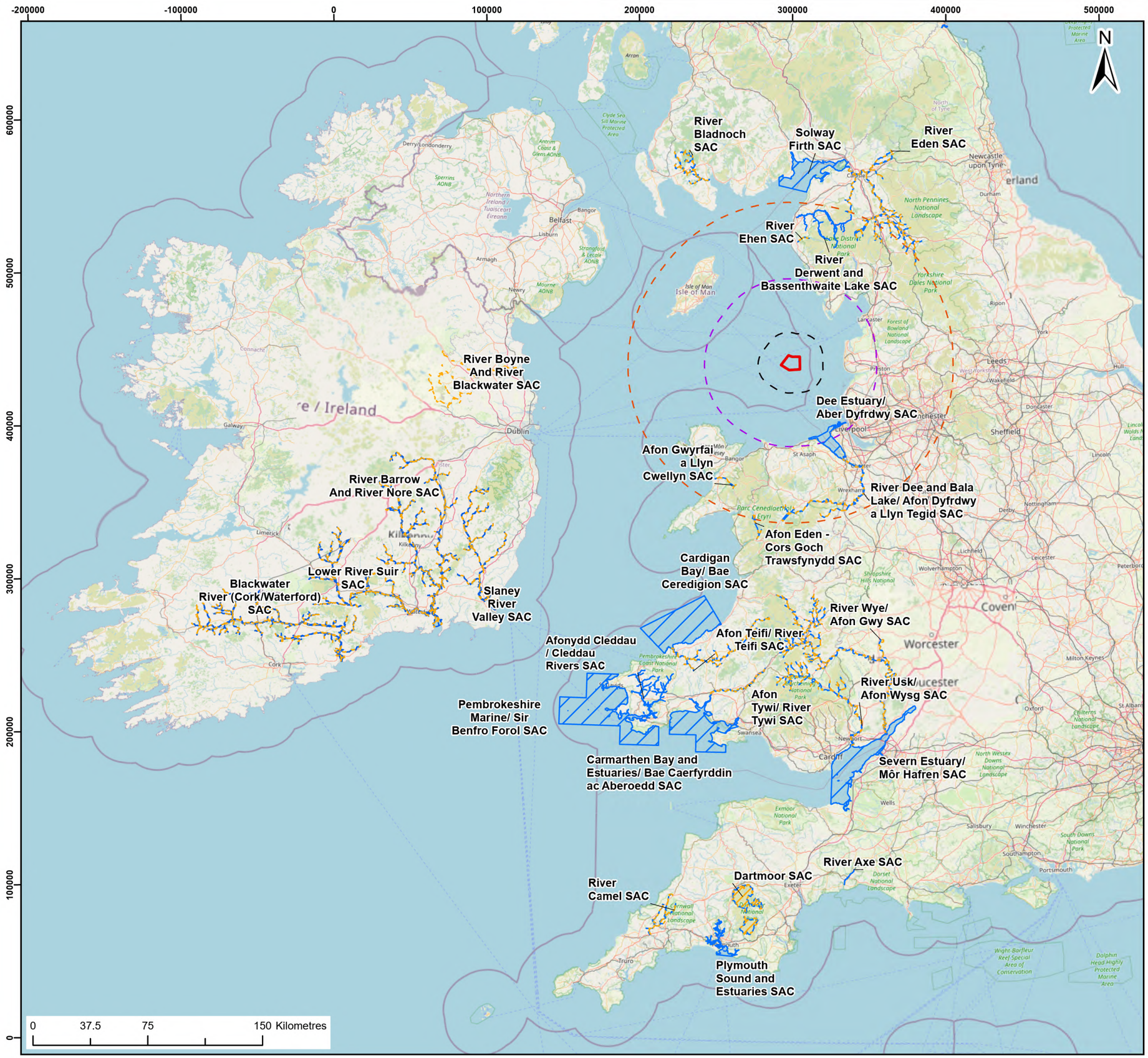
Site Code	Country	Designation name	Qualifying feature	Distance from development at its closest point	Significance of effect (alone or in-combination)	Rationale
			1096 Brook lamprey	100km from the site)		and in-combination.
UK0030249	Scotland	River Bladnoch SAC	1106 Atlantic salmon	125.64km	No LSE (Screened out)	Beyond the range of potential direct impact, interaction with individuals outside of the site with the Project's activities unlikely. No in-combination effects identified.
UK0012642	England/Wales	River Wye/Afon Gwy SAC	1095 Sea lamprey 1099 River lamprey 1096 Brook lamprey 1106 Atlantic salmon 1102 Allis shad	147.19km	No LSE (Screened out)	Beyond the range of potential direct impact, interaction with individuals outside of the site with the Project's activities unlikely. No in-combination effects identified.
UK0012712	Wales	Cardigan Bay/Bae Ceredigion	1095 Sea lamprey 1099 River lamprey	157.50km	No LSE (Screened out)	Beyond the range of potential direct impact, interaction with individuals outside of the site with the Projects activities unlikely. No in-combination effects identified.

Site Code	Country	Designation name	Qualifying feature	Distance from development at its closest point	Significance of effect (alone or in-combination)	Rationale
UK0012670	Wales	Afon Teifi/River Teifi SAC	1099 River lamprey 1096 Brook lamprey 1106 Atlantic salmon	162.27km	No LSE (Screened out)	Beyond the range of potential direct impact, interaction with individuals outside of the site with the Project's activities unlikely. No in-combination effects identified.
002299	Republic of Ireland	River Boyne and River Blackwater SAC	1099 River lamprey 1106 Atlantic salmon	173.22km	No LSE (Screened out)	Beyond the range of potential direct impact, interaction with individuals outside of the site with the Project's activities unlikely. No in-combination effects identified.
UK0013007	Wales	River Usk/Afon Wysg SAC	1095 Sea lamprey 1099 River lamprey 1096 Brook lamprey 1106 Atlantic salmon 1103 Twaite shad 1102 Allis shad	190.60km	No LSE (Screened out)	Beyond the range of potential direct impact, interaction with individuals outside of the site with the Project's activities unlikely. No in-combination effects identified.

Site Code	Country	Designation name	Qualifying feature	Distance from development at its closest point	Significance of effect (alone or in-combination)	Rationale
UK0013010	Wales	Afon Tywi/River Tywi	1095 Sea lamprey 1099 River lamprey 1096 Brook lamprey 1106 Atlantic salmon 1102 Allis shad 1103 Twaite shad	195.56km	No LSE (Screened out)	Beyond the range of potential direct impact, interaction with individuals outside of the site with the Project's activities unlikely. No in-combination effects identified.
000781	Republic of Ireland	Slaney River Valley SAC	1095 Sea lamprey 1099 River lamprey 1096 Brook lamprey 1106 Atlantic salmon 1103 Twaite shad	207.42km	No LSE (Screened out)	Beyond the range of potential direct impact, interaction with individuals outside of the site with the Project's activities unlikely. No in-combination effects identified.
002162	Republic of Ireland	River Barrow and River Nore SAC	1095 Sea lamprey 1099 River lamprey 1096 Brook lamprey 1106 Atlantic salmon 1103 Twaite shad	227.74km	No LSE (Screened out)	Beyond the range of potential direct impact, interaction with individuals outside of the site with the Project's activities unlikely. No in-combination effects identified.
UK0020020	Wales	Carmarthen Bay and Estuaries/Bae	1095 Sea lamprey	218.20km	No LSE	Beyond the range of potential direct

Site Code	Country	Designation name	Qualifying feature	Distance from development at its closest point	Significance of effect (alone or in-combination)	Rationale
		Caerfyrddin ac Aberoedd	1099 River lamprey 1103 Twaite shad		(Screened out)	impact, interaction with individuals outside of the site with the Project's activities unlikely. No in-combination effects identified.
UK0013116	Wales	Pembrokeshire Marine/Sir Benfro Forol	1095 Sea lamprey 1099 River lamprey 1102 Allis shad 1103 Twaite shad	227.75km	No LSE (Screened out)	Beyond the range of potential direct impact, interaction with individuals outside of the site with the Project's activities unlikely. No in-combination effects identified.
UK0013030	England/Wales	Severn Estuary/Môr Hafren	1095 Sea lamprey 1099 River lamprey 1103 Twaite shad	232.31km	No LSE (Screened out)	Beyond the range of potential direct impact, interaction with individuals outside of the site with the Projects activities unlikely. No in-combination effects identified.
002137	Republic of Ireland	Lower River Suir SAC	1095 Sea lamprey 1099 River lamprey	278.94km	No LSE (Screened out)	Beyond the range of potential direct impact, interaction with individuals outside of the site

Site Code	Country	Designation name	Qualifying feature	Distance from development at its closest point	Significance of effect (alone or in-combination)	Rationale
			1096 Brook lamprey 1106 Atlantic salmon 1103 Twaite shad			with the Project's activities unlikely. No in-combination effects identified.
002170	Republic of Ireland	Blackwater River (Cork/Waterford) SAC	1095 Sea lamprey 1099 River lamprey 1096 Brook lamprey 1106 Atlantic salmon 1103 Twaite shad	323.09km	No LSE (Screened out)	Beyond the range of potential direct impact, interaction with individuals outside of the site with the Project's activities unlikely. No in-combination effects identified.



Legend:

- Morecambe Offshore Windfarm Site
- Morecambe Offshore Windfarm Site 15km buffer
- Morecambe Offshore Windfarm Site 50km buffer
- Morecambe Offshore Windfarm Site 100km buffer
- Special Area of Conservation (SAC)
- Special Areas of Conservation (SAC) related to salmon (Annex II migratory fish)

Report: Morecambe Offshore Windfarm: Generation Assets HRA Screening

Title: SACs considered in the HRA Stage 1 assessment in relation to Annex II migratory fish

Figure: 6.1

Drawing No: PC1165-RHD-ZZ-OF-DR-Z-0087

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
P03	01/03/2024	JH	SB	A3	1:2,500,000
P04	15/04/2024	JH	SB	A3	1:2,500,000

Co-ordinate system: WGS 1984 UTM Zone 30N

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7 Marine Mammals (Annex II species)

7.1 Approach to screening

130. For marine mammals, the approach to HRA screening is primarily focused on the potential for connectivity between individual marine mammals from designated populations and the Project windfarm site (i.e. demonstration of a clear source-pathway-receptor relationship). This was based on the distance of the Project windfarm site from the designated site(s), the range of each effect, and the potential for marine mammals from a designated site to be within range of an effect.

131. The HRA screening exercise therefore considered designated sites which meet the following criteria:

- The distance between the potential effect of the Project and a designated site with marine mammals as a qualifying feature is within the range for which there could be an interaction (for example, the pathway is not too long for significant noise propagation and therefore the site is within the ZoI for underwater noise effects)
- The distance between the Project and resources on which the qualifying marine mammal feature depends (i.e. an indirect effect acting though prey or access to habitat) is within the potential ZoI (for example, the pathway is not too long)
- The likelihood that a foraging area or a migratory route occurs within the ZoI of the proposed Project (applies to mobile interest features when outside the designated site)

132. Designated sites that did not meet these criteria have been screened out from further assessment.

133. The approach taken was informed by HRA screening reports for OWFs recently submitted to PINS (principally North Falls, Dudgeon and Sheringham Shoal Extensions, East Anglia ONE North and East Anglia TWO), along with corresponding stakeholder feedback.

134. Assessment of species-specific risk to potential effects of OWFs is informed by industry standard advice and guidance, relevant scientific papers, and representations from both applicants and stakeholders during DCO examinations for OWFs.

135. Information on SACs with marine mammals as a qualifying feature is taken from SAC citations/Natura 2000 forms, conservation objectives, and other relevant information, as published by the relevant Statutory Nature Conservation Bodies (SNCBs). Advice on operations was not considered

necessary for screening, but may be referred to, as required, for the later stages of the HRA.

136. Distances between the Project and SAC sites were measured in Geographical Information System (GIS) (the shortest straight-line distance) using SAC boundary shapefiles downloaded from SNCB websites.

137. Note, the clearance of UXO, if required, at the Project site would be assessed as part of separate Marine Licence post-consent and not contained in the DCO Application. Therefore, worst-case assessments for UXO are included as an Appendix to the Marine Mammal chapter of the ES for information only (**Appendix 11.3 Marine Mammal Unexploded Ordnance Assessment** (Document Reference 5.2.11.3). Detailed cumulative assessments were also undertaken for the ES, including UXO, which inform the RIAA. UXO assessments have not been included in detail in the HRA submitted for DCO Application, as this would be included in more detail in separate Marine Licence, when the latest information is available on what, if any, UXO clearance is required.

7.2 Potential effects considered in screening

138. Effects to marine mammals may arise from permanent or temporary physical presence of the Project and/or activities relating to the construction, operation and maintenance or decommissioning of the Project and associated offshore infrastructure. Potential effects include indirect effects, for example, through effects on prey species, and direct effects, for example from underwater noise and vessel interactions.

139. The key factors considered during the HRA screening process were:

- Potential effects (source)
- Proximity of source to feature (i.e. the distance between the potential effects and marine mammals from designated sites) (pathway and receptor)

140. **Table 7.1** presents a summary of the potential effects during construction, operation and maintenance and decommissioning considered in the HRA screening. Further information on each of the potential effects are provided in the following sections of this report.

Table 7.1 Summary of potential effects on marine mammals considered in HRA screening (screened in (✓) and screened out(X))

Potential effect	Construction	Operation and maintenance	Decommissioning
Physical or auditory injury and behavioural effects from underwater noise during the construction, operation and maintenance, and decommissioning (including, but not limited to, piling, other construction activities, vessel noise, operation and maintenance activities, operational wind turbines, and decommissioning activities)	✓	✓	✓
Any barrier effects as a result of underwater noise	✓	✓	✓
Vessel interactions (increased risk of collision)	✓	✓	✓
Disturbance at seal haul-out sites	✓	✓	✓
Changes to water quality	✓	✓	✓
Changes to prey availability and any disturbance to foraging at sea	✓	✓	✓
Barrier effects due to the physical presence of offshore infrastructure	X	X	X
Effects of EMF	X	X	X
In-combination effects	✓	✓	✓
Transboundary effects	✓	✓	✓

7.2.1 Potential effects with no potential for LSE

141. As shown in **Table 7.1** above, the potential for barrier effects, and effects due to EMF were screened out of further assessment.

7.2.1.1 Screening out of physical barrier effects

142. The presence of a windfarm could be seen as having the potential to create a physical barrier, preventing movement or migration of marine mammals between important feeding and/or breeding areas, or potentially increasing swimming distances if marine mammals circumvent the site.

143. Data from operational windfarms show no evidence of the exclusion of marine mammals, including harbour porpoise and seals (for example, Diederichs *et al.,* 2008; Lindeboom *et al.,* 2011; Marine Scotland, 2012; McConnell *et al.,* 2012; Russell *et al.,* 2014; Scheidat *et al.,* 2011; Teilmann *et al.,* 2006; Tougaard *et al.,* 2005, 2009a, 2009b). In addition, marine mammal species, including harbour porpoise and seals, have been known to forage within operational windfarm sites (with fixed foundation) (e.g. Lindeboom *et al.,* 2011; Russell *et al.,* 2014) indicating no restriction to movements.

144. Therefore, it was considered that there is no potential for LSE to marine mammals as a result of the physical presence of the windfarms and this has been **screened out** of further assessment.

145. Note that the potential for any acoustic barrier effects, as a result of underwater noise during construction, have been included as part of the underwater noise assessment.

7.2.1.2 Screening out of direct effects of EMF

146. Studies indicate that magnetic fields decrease rapidly with vertical and horizontal distance from subsea cables and that the reduction is greater the deeper cables are buried (Normandeau *et al.,* 2011).

147. Although it is assumed that marine mammals are capable of detecting small differences in magnetic field strength, this is unproven and is based on circumstantial information. There is also, at present, no evidence to suggest that existing subsea cables influence cetacean movements.

148. Harbour porpoise have been known to move in and out of the Baltic Sea, over several operating subsea cables in the Skagerrak and western Baltic Sea, with no apparent effect to their migratory movements. There is also no evidence to suggest that seal species respond to EMF (Gill *et al.,* 2005). In addition, as outlined above, data from a number of operational windfarms showed no evidence of exclusion of marine mammals, including harbour porpoise and seals.

149. Therefore, it was considered that there is no potential for LSE on marine mammal species as a result of EMF, and this was **screened out** of further assessment.

7.2.2 Potential effects with potential for LSE

7.2.2.1 Underwater noise

150. The key potential effects during construction for marine mammals are expected to be those from underwater noise, which has the potential for the following effects:

- Physical injury
- Permanent auditory injury/permanent loss of hearing sensitivity (referred to as Permanent Threshold Shift (PTS))
- Temporary auditory injury/temporary loss in hearing sensitivity (referred to as Temporary Threshold Shift (TTS))
- Disturbance and behavioural effects
- Effects on prey species
- Barrier effects

151. Activities that have the potential to generate underwater noise associated with the construction of the Project are:

- Installation of foundations (depending on method used) for the WTGs
- Installation of foundations for the offshore substation(s)
- Other construction activities such as seabed preparation, cable laying and rock placement
- Vessel movements

152. Site specific underwater noise modelling has been undertaken for all potential noise sources that could affect marine mammals, including operational noise sources.

153. If required, UXO clearance would be assessed as part of a separate Marine Licence and not part of the DCO submission. A more detailed assessment would be undertaken for the separate Marine Licence when more information on the requirement for and details of any UXO clearance is available.

154. The potential effects associated with underwater noise were **screened in** and are assessed in the RIAA, considering the most recent and robust research, guidance and information available.

155. Whilst not taken into consideration in the screening assessment, a Marine Mammal Mitigation Protocol (MMMP) would be agreed to reduce the risk of physical injury or PTS in marine mammals from underwater noise.

7.2.2.2 Vessel interaction

156. Despite the potential for marine mammals to detect and avoid vessels, ship strikes are known to occur (Wilson *et al*., 2007). An increase in vessels could potentially lead to an increase in vessel collision risk.

157. The increased risk of collision with marine mammals was **screened in** and is assessed in the RIAA.

7.2.2.3 Disturbance to seals at haul-out sites

158. Disturbance from vessel transits to and from the Project and the local port also has the potential to disturb seals at haul-out sites, depending on the route and proximity to the haul-out sites. The potential for disturbance at seal haul-out sites was **screened in** and assessed in the RIAA, taking into account the most recent and robust research, guidance and information available.

159. The potential for any disturbance of seals from haul-out sites foraging at sea has also been determined within the RIAA.

7.2.2.4 Changes to prey resource

160. The potential for any changes to the prey resource for marine mammals during construction was **screened in**.

7.2.2.5 Changes to water quality

161. Potential effects related to changes in water quality were **screened in** for assessment.

7.3 Baseline Information

162. Initial assessments of the distribution of marine mammals throughout the Irish Sea and relevant Management Units (MUs) have identified four marine mammal species listed under Annex II that occur throughout the region and throughout the windfarm site and surrounding area. These are:

- Harbour porpoise *Phocoena phocoena*
- Bottlenose dolphin *Tursiops truncates*
- Grey seal *Halichoerus grypus*
- Harbour seal *Phoca vitulina*

163. MUs provide an indication of the spatial scales at which effects of plans and projects alone, cumulatively and in-combination, need to be assessed for the key cetacean species in UK waters, with consistency across the UK and have been applied as the foundation of the assessment (Inter-Agency Marine Mammal Working Group (IAMMWG), 2015; 2021).

164. Monthly site-specific aerial surveys for marine mammals and ornithology commenced in March 2021 and continued until February 2023. The survey area included the windfarm site and a 4km buffer, an industry standard approach to surveying OWFs. This buffer was extended to 10km to the north and east due to proximity to Liverpool Bay SPA. In total, 24 months of data was collected for the site and buffer and, where possible, the density estimates were calculated from the raw data counts for marine mammal species recorded in high enough numbers.

7.3.1 Harbour porpoise

165. In the Irish Sea, the harbour porpoise is the most commonly observed odontocete. Harbour porpoise are widely distributed throughout the Celtic and Irish Seas (CIS) during most months of the year (Reid *et al.,* 2003; Mackey *et al.,* 2004; Baines and Evans, 2012; Hammond *et al.,* 2013, 2017, 2021; Rogan *et al.,* 2018).

166. Harbour porpoise within the eastern North Atlantic are generally considered to be part of a continuous biological population that extends from the French coastline of the Bay of Biscay to northern Norway and Iceland (Tolley and Rosel, 2006; Fontaine *et al.,* 2007, 2014; IAMMWG, 2015, 2021). However, for conservation and management purposes, it is necessary to consider this population as smaller MUs.

167. The windfarm site is located in the CIS MU, which has an estimated harbour porpoise abundance of 62,517 (IAMMWG, 2021), based on the Small Cetaceans in the European Atlantic and North Sea (SCANS)-III survey (Hammond *et al.,* 2021) and aerial surveys of cetaceans and seabirds in Irish waters (Rogan, *et al.,* 2018). The CIS MU for harbour porpoise is shown in **Plate 7.1**.

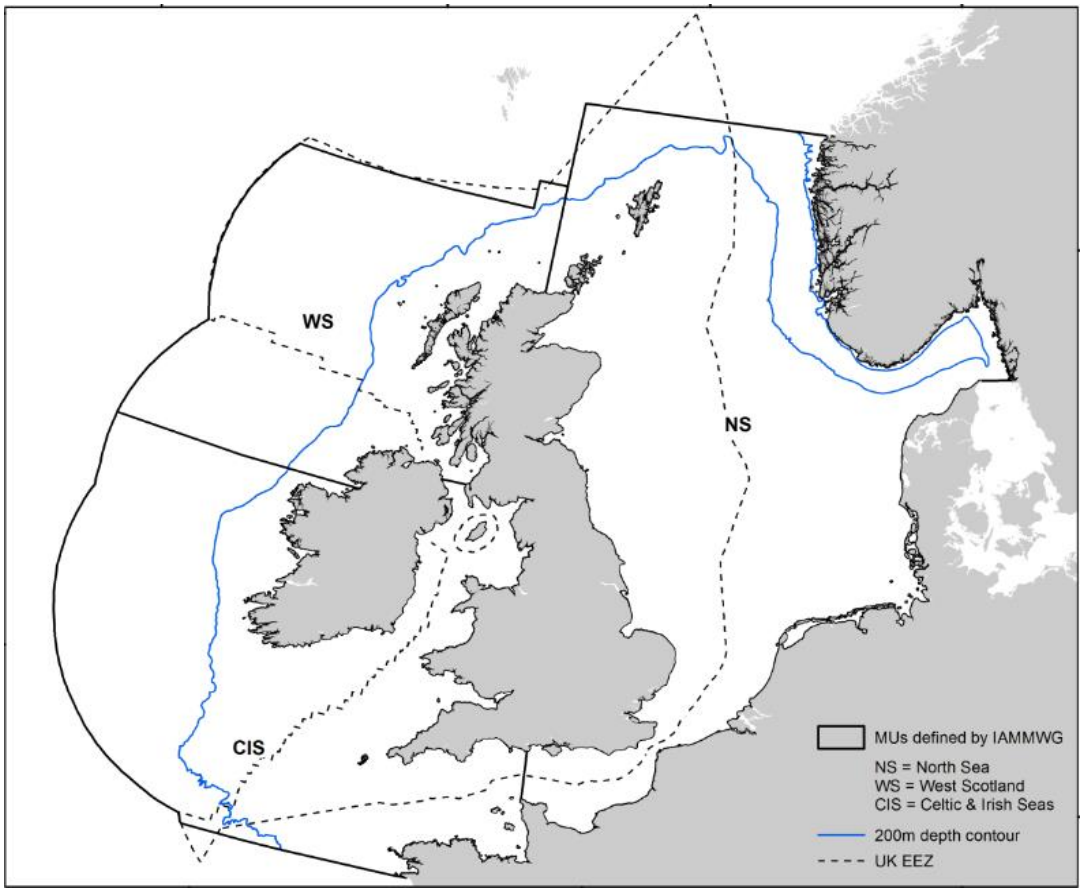


Plate 7.1 The MU for harbour porpoise (CIS MU) (IAMWWG, 2021)

168. The SCANS-III survey, a large-scale survey for small cetaceans across European waters undertaken in the summer of 2016, indicated harbour porpoise to be the only Annex II cetacean species present in the relevant survey block to the Project (Block F). The abundance of harbour porpoise in this survey block was estimated to be 1,056 individuals (95% Confidence Interval (CI) of 342 - 2,010), with an estimated density of 0.086 harbour porpoise per km^2 (Coefficient of Variation (CV) = 0.383) (Hammond *et al*., 2021).

169. The Joint Cetacean Protocol (JCP) Phase III report (Paxton *et al.,* 2016) showed similar results, with only harbour porpoise present with relatively high density in the windfarm site. Distribution maps of cetacean species within the northeast Atlantic (Waggitt *et al.,* 2019) also indicate that harbour porpoise would be the most likely Annex II cetacean species to be present within the windfarm site.

170. A number of aerial surveys were undertaken for the AyM OWF (located 28km to the southwest of the windfarm site) between March 2019 and February 2021. Unknown “dolphin/porpoise” was the most recorded category during the surveys followed by unidentified seal; harbour porpoise was the only marine mammal identified to species within these surveys (Sinclair *et al.,* 2021).

7.3.2 Bottlenose dolphin

171. In the Irish Sea, bottlenose dolphin have a predominantly coastal distribution, with higher concentrations off west Wales (particularly Cardigan Bay) and off the coast of County Wexford in southeast Ireland. They have also been regularly sighted in summer off the Galloway coast of southwest Scotland and around the Isle of Man (Hammond *et al.,* 2005; Baines and Evans, 2012; DECC, 2016).

172. A number of inshore groups of bottlenose dolphin have been identified in UK and Irish waters and there appears to be limited interchange between these groups (Robinson *et al.,* 2012; Cheney *et al.,* 2013; ICES, 2014; IAMMWG, 2015).

173. The windfarm site is located in the Irish Sea MU (see **Plate 7.2**), which has an estimated bottlenose dolphin abundance of 293 (CV = 0.54; 95% CI = 70–492; IAMMWG, 2021). This was used as the screening area for bottlenose dolphin.

174. Bottlenose dolphins were not recorded in the SCANS-III survey block F (where the Project is located), however they were recorded in the nearby survey block E. It was estimated that the abundance of bottlenose dolphin in survey block E was 288 individuals (95% CI of 0 – 664), and the density was estimated to be 0.0082 bottlenose dolphin per km^2, with a mean group size of 1.50 (CV = 0.192; Hammond *et al*., 2021).

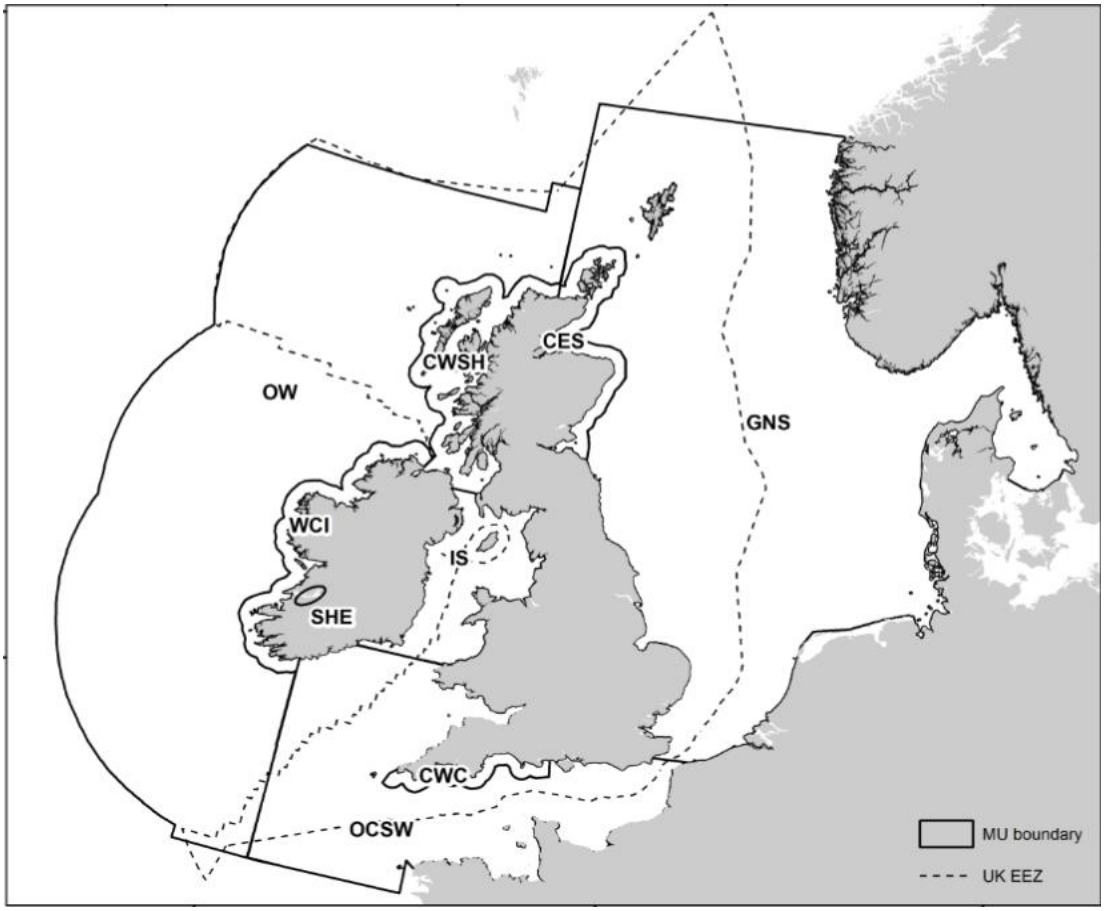


Plate 7.2 The MUs for bottlenose dolphin (Offshore Channel, Celtic Sea, & South West England, and Irish Sea MU) (IAMWWG, 2021)

7.3.3 Grey seal

175. Grey seals only occur in the North Atlantic, Barents and Baltic Sea, with their main concentrations on the east coast of Canada and United States of America and in north-west Europe (Special Committee on Seals (SCOS), 2020). Grey seals are present year-round on both the Irish and Welsh coasts and are known to move between the two, for example between the southeast coast of Ireland and the southwest coast of Wales (Kiely *et al.,* 2000).

176. Grey seals are wide ranging and can breed and forage in different areas (Russell *et al.,* 2013). They generally travel between known foraging areas and back to the same haul-out site but will also move to new sites (Russel, 2016).

177. Grey seals will typically forage in the open sea and return regularly to land to haul-out, although they may frequently travel up to 100km between haul-out sites. Although foraging trips generally occur within 100km of their haul-out sites, grey seal can travel up to several hundred kilometres offshore to forage (SCOS, 2020), and have been reported to have maximum foraging ranges of 448km (Carter *et al*., 2022).

178. A grey seal tagging study was undertaken from 2017-2018 and included in a later review of all grey seal tagging in the UK (Carter *et al*., 2022). A total of 114 individuals were tagged across the UK, including three within the Dee Estuary (Carter *et al*., 2022). The results of this study indicated that grey seal travel through the Irish and Celtic Seas, including around the Wales and Northern Ireland coast, and Republic of Ireland and Isle of Man waters, but there was no detected movement between the Irish Sea and west Scotland (Carter *et al*., 2022; **Plate 7.3**).

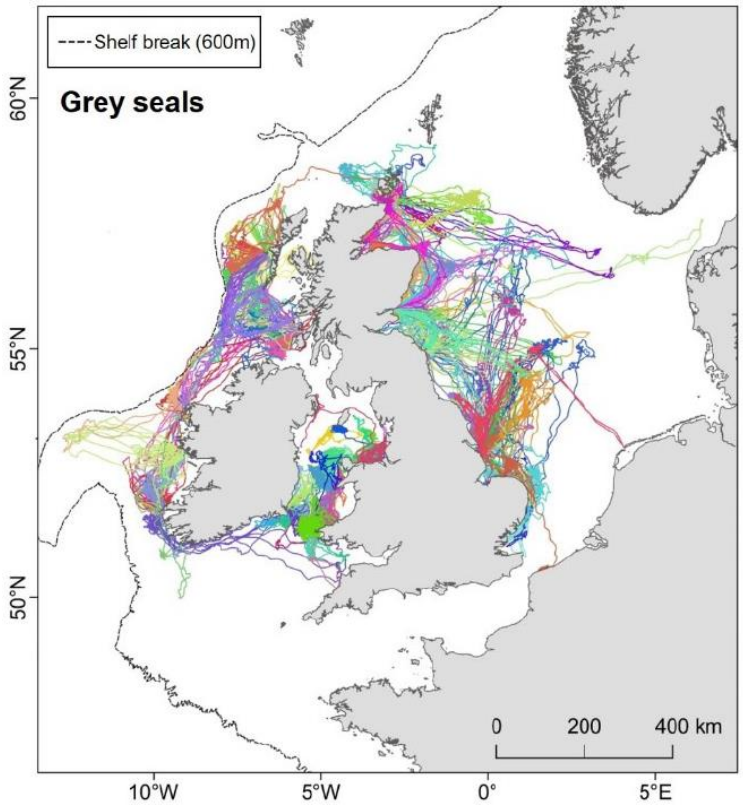


Plate 7.3 Tracking study of grey seal in UK and Republic of Ireland waters (Carter et al., 2022)

179. Based on the movements of grey seal and potential connectivity with the Project, the relevant MUs for grey seal (**Plate 7.4**), include:

- MU 13: North-West England (within which the Project is located)
- MU 12: Wales
- MU 14: Northern Ireland
- Isle of Man
- Republic of Ireland east coast

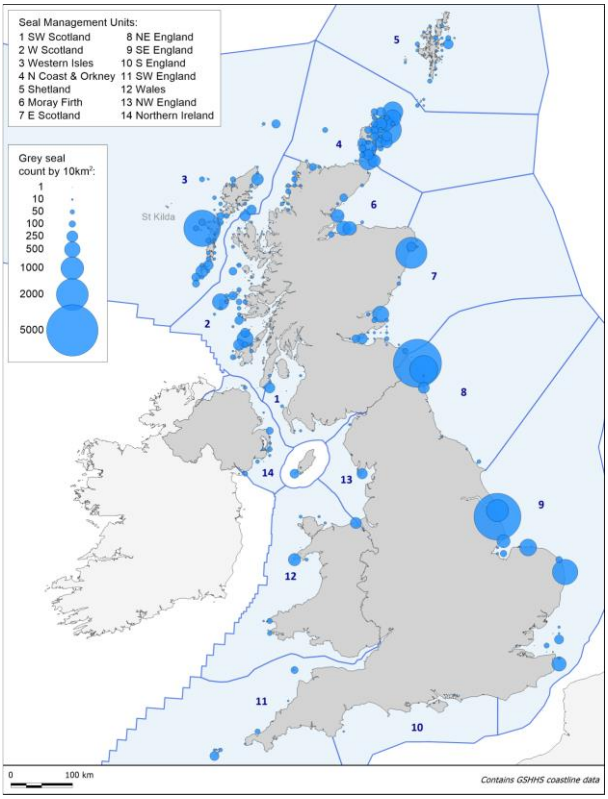


Plate 7.4 Grey seal MUs (and haul-out site counts) (SCOS, 2020)

180. The relevant MUs for grey seal has been used to determine the wider reference population and areas for potential in-combination effects.

181. Grey seal have a number of haul-out sites in the Irish Sea around Pembrokeshire, the Llŷn Peninsula, Anglesey, Liverpool Bay, the Solway Firth, northern Isle of Man, east Northern Ireland, the Firth of Clyde and the Dumfries and Galloway coast (DECC, 2016; SCOS, 2020). There are two main haul-out sites for grey seal in Northwest England MU, in the Dee Estuary on the Welsh-English border (Hilbre Island), and South Walney (SCOS, 2020).

182. For grey seal, densities within the windfarm site were relatively low, with areas of increased densities near to Liverpool Bay and the coastlines of Northern Ireland (Carter *et al*., 2022). Carter *et al*. (2022) and the latest SCOS report have been used to determine density estimates for grey seal.

183. Assessments were based on the latest grey seal counts for the relevant SACs.

7.3.4 Harbour seal

184. There were few harbour seal reported within the Irish Sea, except along the coast of Northern Ireland and in Southwest Scotland (Firth of Clyde), with no breeding sites known along the Welsh coast (DECC, 2016; SCOS, 2021). Harbour seal densities were very low across the Eastern Irish Sea, increasing

slightly in the south near to Liverpool Bay and along the Northern Ireland coast (Carter *et al.,* 2022).

185. Harbour seal densities in the Irish Sea were relatively low, with the exception of the coastlines of Northern Ireland. In the vicinity of the windfarm site, the densities of harbour seal were very low (Carter *et al*., 2022).

186. A review of harbour seal tagging studies was undertaken, with a total of 239 individuals tagged across the UK (Carter *et al*., 2022). The results of this study indicated that harbour seal have a very localised distribution, with seals travelling between North Ireland and the Isle of Man, as far as the windfarm, but there was no movement detected between this area and the west coast of Scotland or Wales (Carter *et al*., 2022; **Plate 7.5**).

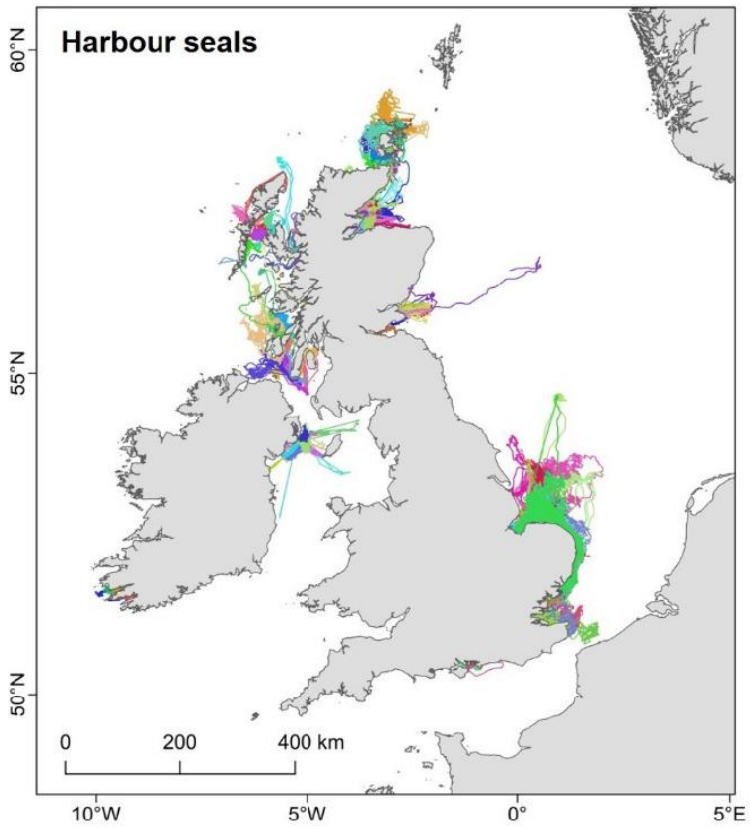


Plate 7.5 Tracking study of harbour seal in UK and Republic of Ireland waters (Carter et al., 2022)

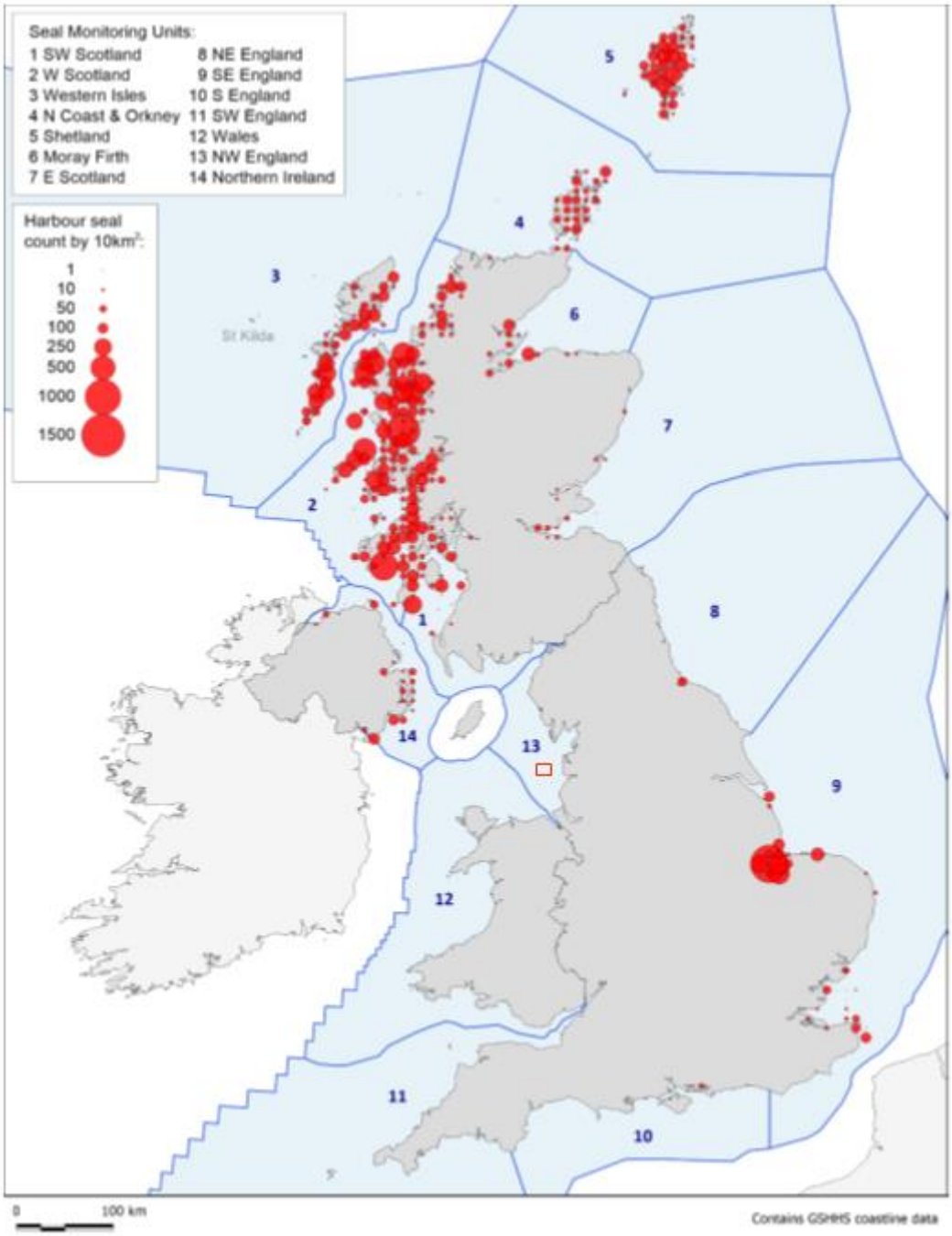


Plate 7.6 Harbour seal MUs in the United Kingdom; Project location is approximate (in red) (SCOS, 2022)

187. Therefore, the relevant MUs (**Plate 7.6**) where there is the potential for connectivity for harbour seal, include:

- MU 13: North-West England (within which the Project is located)
- MU 14: Northern Ireland
- Isle of Man

188. The typical and average foraging range for harbour seal is 50km to 80km (SCOS, 2017). Tracking studies have shown that harbour seal travel 50km to 100km offshore and can travel 200km between haul-out sites (Lowry *et al.,*

2001; Sharples *et al.,* 2012). The range of these trips varied, depending on the location and surrounding marine habitat.

189. Harbour seals are present in relatively low number, with low recorded numbers in the relevant MUs. There are also no harbour seal designated sites within the average foraging ranges of 50km to 80km from the windfarm site. It was therefore considered unlikely that there is the potential for any LSE to any harbour seal designated SAC.

7.4 Identification of sites and features

190. HRA screening for marine mammals considers designated sites and potential in-combination effects within the relevant reference populations for each species. These are:

- Harbour porpoise – CIS (MU)
- Bottlenose dolphin – Irish Sea (MU)
- Grey seal – Northwest England, Wales and Northern Ireland MUs, and the Isle of Man and Republic of Ireland east coast populations
- Harbour seals – Northwest England and Northern Ireland MUs, and the Isle of Man population

191. In total, 29 sites from across the UK, France and Ireland were screened in for potential connectivity within the relevant MU (**Section 7.5**, **Appendix 1** in **Section 11**).

7.4.1 Transboundary effects

192. There is a significant level of marine development being undertaken or planned by Ireland in the Irish Sea and in the English Channel. Populations of marine mammals are highly mobile and there is potential for transboundary effects, especially when considering underwater noise effects.

193. Transboundary effects have been assessed, where possible, in consultation with developers in European Member States to obtain up to date project information to feed into the assessment.

194. The potential for transboundary effects have been addressed by considering the reference populations (MUs) and potential linkages to international designated sites as identified through telemetry studies for seals and ranges and movements of cetacean species.

195. The assessment of the effect on the integrity of the transboundary European sites, as a result of effects on the designated marine mammal populations, has been undertaken and is presented in the information for the RIAA.

196. Transboundary effects have also been considered within the in-combination assessment.

7.5 Screening

197. **Appendix 1** in **Section 11** provides the screening assessment for all designated sites, with either harbour porpoise, bottlenose dolphin, grey seal or harbour seal listed as a qualifying feature with a population grade of A, B, or C[11], within the relevant screening areas.

198. **Figure 7.1** shows the SACs screened in for marine mammals.

7.5.1 Screening results for harbour porpoise

199. Designated sites where harbour porpoise is a qualifying feature, that were **screened in** due to their potential connectivity to the Project are:

- North Anglesey Marine SAC
- North Channel SAC
- West Wales Marine SAC
- Rockabill to Dalkey Island SAC
- Bristol Channel Approaches SAC

200. For harbour porpoise, all other designated sites within the screening area were considered to be too far for there to be the potential for effect.

201. Designated sites with bottlenose dolphin as a qualifying feature that were **screened in** are:

- Pen Llŷn a`r Sarnau SAC
- Cardigan Bay SAC

202. Despite the further distance, Cardigan Bay SAC was also **screened in**, as the same population of bottlenose dolphins found at Pen Llŷn a`r Sarnau SAC are known to travel to Cardigan Bay.

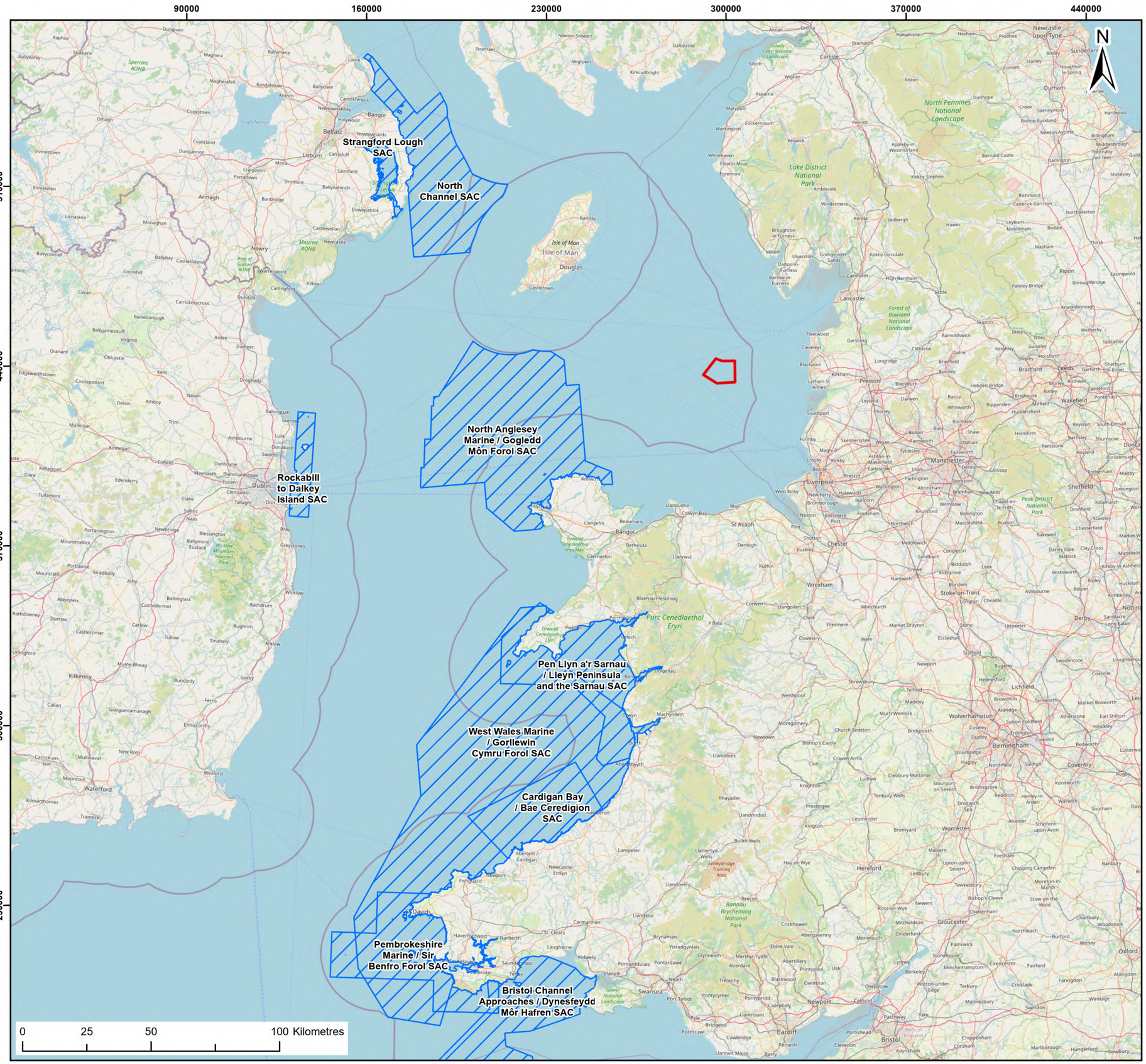
7.5.2 Screening results for grey seal

203. There are no grey seal designated sites within the known average foraging range of 100km (see **Section 7.3.3** for more information). However, as a precautionary approach, the nearest designated sites for grey seal has been **screened in** for further assessment. For grey seal, this is the Pen Llŷn a`r Sarnau SAC, at over 100km from the windfarm site when measured as a coastline distance. In addition, grey seal were **screened in** as part of the Pembrokeshire Marine SAC (over 200km away) and Cardigan Bay SAC (over 150km away).

[11]Category A, B and C: where the population within the site is deemed as Significant or D: Non-significant but present

7.5.3 Screening results for harbour seal

204. There are no harbour seal designated sites within the known average foraging range of 80km. However, as a precautionary approach, the nearest designated site for harbour seal has been **screened in** for further assessment. For harbour seal, the nearest designated site is Strangford Lough SAC, at 133km from the windfarm site.



Legend:

Morecambe Offshore Windfarm Site

Designated site

Special Areas of Conservation (SAC)

Report: Morecambe Offshore Windfarm: Generation Assets HRA Screening

Title: Designated sites screened in for marine mammals

Figure: 7.1

Drawing No: PC1165-RHD-ZZ-OF-DR-Z-0093

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
P04	01/03/2024	JH	SB	A3	1:1,500,000
P05	09/04/2024	JH	SB	A3	1:1,500,000

Co-ordinate system: WGS 1984 UTM Zone 30N

MORECAMBE

Royal HaskoningDHV
Enhancing Society Together

8 Ornithology (Birds Directive Annex 1 and migratory species)

8.1 Approach to screening

205. Ornithology receptors potentially affected by the construction, operation and maintenance and decommissioning of the Project would predominantly comprise:

- Waterfowl (ducks, geese and swans), waders, gulls and terns
- Seabirds, defined for this report as auks, gulls, terns, gannets, skuas, shearwaters, petrels and divers

206. These species have the potential to be present during the breeding season and non-breeding season (including spring/autumn migration/passage periods). Other bird species that may be affected by the Project include waterfowl, waders and birds of prey, which may fly through the Project area during spring and/or autumn migration/passage periods. Refer to **Appendix 2** in **Section 12** for a list of all bird species considered in the HRA screening, including scientific names.

207. The HRA screening for ornithology considered SPAs and Ramsar Sites which met at least one of the following criteria in relation to the Project:

- Part of the windfarm site overlaps directly with an SPA/Ramsar Site, or is located in close proximity to the boundary, such that there may be an effect on one or more qualifying species within the SPA
- The windfarm site is within a distance of an SPA/Ramsar Site which means there could be an interaction between the Project and qualifying features of the SPA/Ramsar Site (i.e., the pathway is not too long, discussed in further detail in **Section 8.4**
- For seabirds during the breeding season this is informed by published information on the mean maximum foraging ranges from breeding colonies (Woodward et al., 2019)
- For seabirds during the non-breeding season, Biologically Defined Minimum Population Scales (BDMPS) from Furness (2015) have been used to produce estimates of the proportion of a given SPA population which is present at the windfarm site and a 1% criterion is used for screening
- For migratory birds other than seabirds, SPAs within 100km of the windfarm site are considered
- The distance between the windfarm site and resources on which the qualifying feature depends (i.e. an indirect effect acting through prey or access to habitat) is within the range for which there could be an

interaction (i.e. the pathway is not too long), applying professional judgment

208. The approach taken was informed by HRA screening reports for OWFs recently submitted to PINS (principally North Falls, Dudgeon and Sheringham Shoal Extensions, East Anglia ONE North and East Anglia TWO), along with corresponding stakeholder feedback.

209. Assessment of species-specific risk to potential effects arising from OWFs is informed by industry standard advice and guidance, relevant scientific papers, and representations from both applicants and stakeholders during DCO examinations for OWFs.

210. Information on SPAs, Ramsar Sites and their qualifying features is taken from SPA citations/Natura 2000 forms, conservation objectives, departmental briefs and Ramsar Site lists and Information Sheets, as published by the SNCBs, including Natural England's Designated Sites View, NatureScot's Sitelink, Northern Ireland DAERA Protected Areas Search, National Parks and Wildlife Service (Ireland) protected sites information, and Joint Nature Conservation Committee (JNCC) links to Ramsar Information Sheets. Advice on operations for Marine Protected Areas were not considered necessary for screening but were referred to as required in the RIAA.

211. Distances between the windfarm site and SPAs/Ramsar Sites were measured in GIS (the shortest straight-line distance) using shapefiles downloaded from SNCB websites. 'Across-sea' distances were also estimated for some sites, where appropriate, as many seabird species will not regularly travel across land during foraging/migratory movements.

8.2 Potential effects considered in screening

212. Screening of SPAs and Ramsar Sites for offshore ornithology took account of the potential effect(s) of the Project on each qualifying feature. Direct or indirect effects to offshore ornithology receptors in offshore waters may arise from temporary and permanent infrastructure and activities associated with the construction, operation and maintenance and decommissioning of the Project, as identified in **Table 8.1**. This included consideration of construction and decommissioning activities (for example, through the presence of construction vessels, noise and visual disturbance and the presence of lighting at night), operational activity (including presence of WTGs and associated maintenance activity) and secondary effects (for example, through impacts to supporting habitats and prey species of qualifying birds species). The screening also considered the potential for in-combination and transboundary effects through each phase of the Project. Thus, where an SPA and qualifying species were screened in for LSE, the potential effect(s) that were relevant (e.g. where a species is considered vulnerable to collision) were also stated.

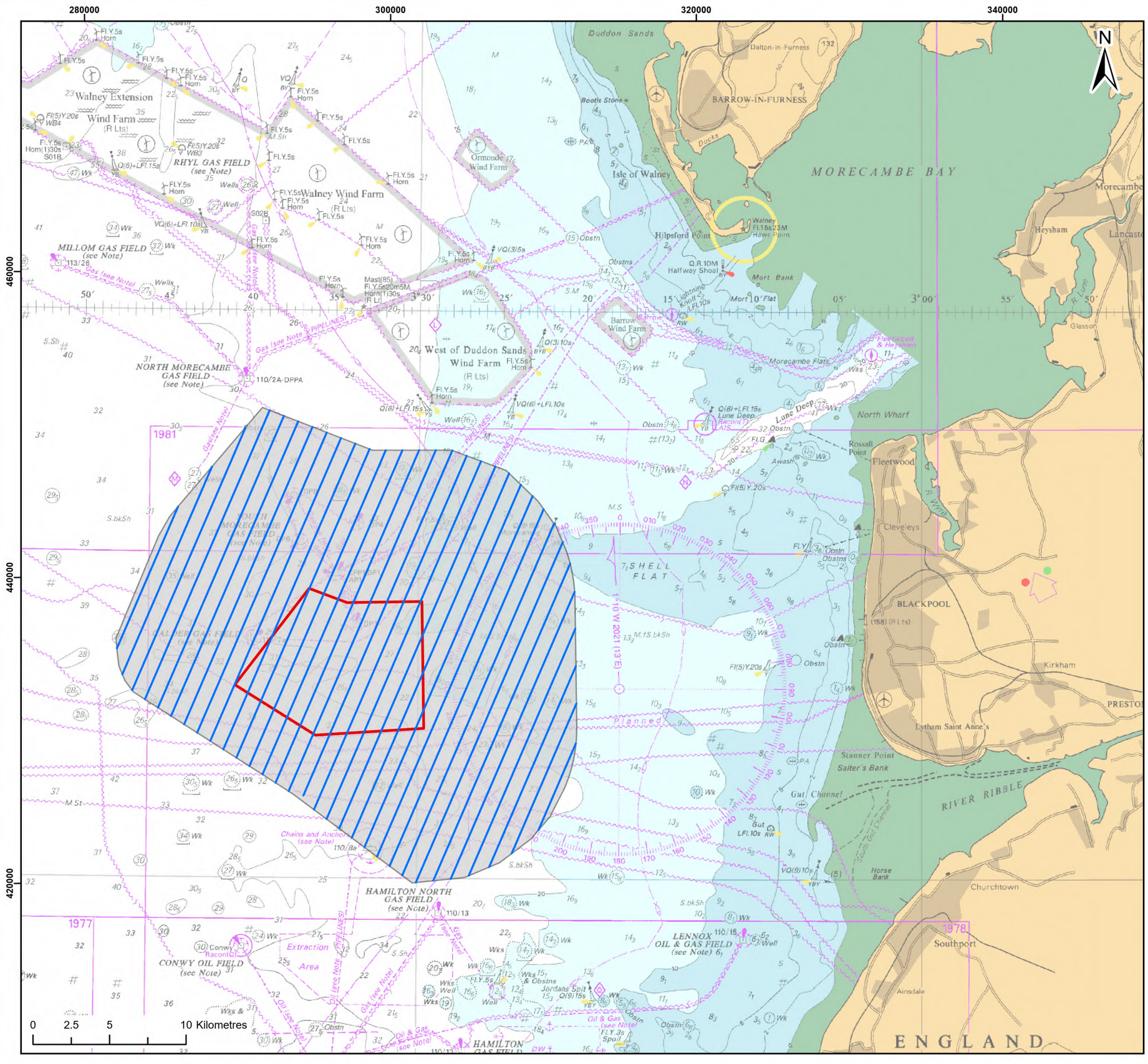
Table 8.1 Summary of the potential effects of the Project on onshore and offshore ornithology receptors considered in HRA Screening (screened in (✓) and screened out (✗))

Potential effect	Construction	Operation and maintenance	Decommissioning
Disturbance and displacement due to work activity, presence/movements of vessels/plant, and lighting	✓	✓	✓
Disturbance/displacement/barrier effect due to presence of WTGs and other infrastructure	✗	✓	✗
Collision risk due to the presence of WTGs and other infrastructure	✗	✓	✗
Indirect effects through effects on habitats and prey species	✓	✓	✓
In-combination effects	✓	✓	✓
Transboundary effects	✓	✓	✓

8.3 Baseline information

213. This section gives an overview of the baseline data for offshore ornithology that has been collected by the Project through two years of digital aerial surveys (March 2021 - February 2023). Surveys have covered the windfarm site, together with a 4km buffer to the south and west, and 10km buffer to the north and east (within Liverpool Bay SPA); refer to **Figure 8.1.** The 4km buffer is standard best practice for most bird species. An extended 10km buffer has been surveyed where this overlaps with Liverpool Bay SPA, as this site has been designated for red-throated diver. This species is known to be sensitive to disturbance/displacement effects over greater distances than most species, and therefore the extended buffer reflects this and is in accordance with advice from UK SNCBs (2022).

214. **Table 8.2** provides the design-based monthly peak abundance estimates of species recorded within the windfarm site and 4km buffer. This information has been included to provide an overview of the relative abundance of species recorded within the windfarm site and surrounding areas. It includes apportioning of unidentified species and (for guillemot, razorbill and puffin only) adjustment for availability bias to account for diving birds. Biologically relevant seasons for seabirds are provided in **Table 8.3.**



Legend:

- Morecambe Offshore Windfarm Site
- Aerial survey plan
- Aerial survey plan (1km Transects)

Report: Morecambe Offshore Windfarm: Generation Assets HRA Screening

Title: Offshore Aerial Survey Area

Figure: 8.1 | Drawing No: PC1165-RHD-ZZ-OF-DR-Z-0102

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
P01	24/05/2022	JT	SB	A3	1:250,000
P02	19/04/2024	JH	SB	A3	1:250,000

Co-ordinate system: WGS 1984 UTM Zone 30N

MORECAMBE

Royal HaskoningDHV
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Table 8.2 Apportioned population estimates (with 95% confidence intervals in parentheses) within the windfarm site and 4km buffer area in 24 months of baseline surveys (March 2021 to February 2023)

Species	Year	J*	F	M	A	M	J	J	A	S	O	N	D
Arctic skua	Mar 21-Feb 22	0	0	0	0	0	0	0	0	0	0	0	0
	Mar 22-Feb 23	0	0	0	0	0	0	0	0	4 (0 – 12)	0	0	0
Arctic tern	Mar 21-Feb 22	0	0	0	0	0	0	0	13 (0 – 36)	9 (0 – 18)	0	0	0
	Mar 22-Feb 23	0	0	0	0	127 (57 – 200)	0	0	0	0	0	0	0
Black-headed gull	Mar 21-Feb 22	0	4 (0 – 12)	0	0	0	0	0	0	0	0	0	0
	Mar 22-Feb 23	0	0	4 (0 – 12)	5 (0 – 12)	0	0	0	0	0	0	4 (0 – 12)	0
Common gull	Mar 21-Feb 22	70 (36 – 109)	37 (16 – 63)	57 (12 – 109)	0	5 (0 – 16)	0	0	0	7 (0 – 21)	16 (0 – 35)	17 (0 – 36)	57 (20 – 100)
	Mar 22-Feb 23	16 (0 – 36)	30 (9 – 58)	4 (0 – 12)	4 (0 – 12)	1 (0 – 1)	0	0	9 (0 – 24)	0	8 (0 – 20)	64 (27 – 108)	132 (93 – 171)
Common scoter	Mar 21-Feb 22	36 (0 – 108)	0	0	0	0	0	0	0	0	0	0	0
	Mar 22-Feb 23	9 (0 – 20)	0	5 (0 – 12)	5 (0 – 12)	0	0	0	0	0	0	0	51 (0 – 133)
Common tern	Mar 21-Feb 22	0	0	0	0	0	0	0	8 (0 – 24)	27 (5 – 57)	0	0	0

Species	Year	J*	F	M	A	M	J	J	A	S	O	N	D
	Mar 22-Feb 23	0	0	0	0	14 (2 – 32)	0	0	0	4 (0 – 12)	0	0	0
Cormorant	Mar 21-Feb 22	0	0	0	0	0	0	0	0	0	0	0	0
	Mar 22-Feb 23	5 (0 – 13)	0	0	0	0	0	0	0	0	0	0	0
Dunlin	Mar 21-Feb 22	0	0	0	0	0	0	0	0	0	0	0	0
	Mar 22-Feb 23	0	0	0	0	26 (0 – 67)	0	0	0	0	0	0	0
Fulmar	Mar 21-Feb 22	0	0	9 (0 – 20)	4 (0 – 12)	0	0	0	31 (12 – 57)	0	0	0	0
	Mar 22-Feb 23	0	0	0	8 (0 – 24)	97 (23 – 210)	0	12 (0 – 27)	0	0	0	12 (0 – 24)	0
Gannet	Mar 21-Feb 22	0	0	29 (4 – 63)	13 (0 – 28)	68 (28 – 117)	9 (0 – 20)	288 (215 – 384)	864 (621 – 1160)	158 (78 – 245)	13 (0 – 25)	13 (0 – 37)	0
	Mar 22-Feb 23	0	0	0	36 (4 – 88)	467 (136 – 908)	53 (24 – 88)	188 (111 – 280)	133 (87 – 182)	40 (16 – 68)	28 (8 – 49)	9 (0 – 20)	0
Great black-backed gull	Mar 21-Feb 22	8 (0 – 20)	4 (0 – 12)	0	0	5 (0 – 12)	0	16 (4 – 31)	4 (0 – 12)	17 (0 – 43)	4 (0 – 12)	6 (0 – 14)	0
	Mar 22-Feb 23	9 (0 – 24)			17 (0 – 44)	88 (8 – 216)	0	0	5 (0 – 12)	5 (0 – 13)	21 (4 – 40)	9 (0 – 20)	17 (0 – 41)
Great skua	Mar 21-Feb 22	0	0	0	0	4 (0 – 12)	0	0	5 (0 – 16)	0	0	0	0

Species	Year	J*	F	M	A	M	J	J	A	S	O	N	D
	Mar 22-Feb 23	0	0	0	0	0	0	0	0	0	0	0	0
Guillemot	Mar 21-Feb 22	1870 (1192 – 2627)	2575 (1839 – 3401)	5557 (4478 – 6644)	1011 (861 – 1154)	715 (461 – 1028)	895 (581 – 1281)	7260 (6011 – 8479)	13110 (9325 – 17151)	640 (340-955)	4286 (3064 – 5650)	3257 (2439 –- 4408	216 (128 – 333)
	Mar 22-Feb 23	939 (677 – 1195)	1031 (785 – 1280)	817 (495 – 1171)	1543 (1113 – 2057)	7639 (5207 – 11128)	3547 (2360 – 4882)	10929 (7957 – 14140)	11415 (10162- 12929)	8957 (8136 – 9816)	7775 (6890 – 8766)	2737 (2217 – 3367)	3836 (3396 – 4338)
Herring gull	Mar 21-Feb 22	43 (4 – 101)	33 (16 – 52)	134 (55 – 236)	13 (0 – 31)	0	9 (0 – 25)	12 (0 – 28)	48 (0 – 137)	178 (10 – 469)	49 (0 – 144)	28 (4 – 57)	17 (0 – 36)
	Mar 22-Feb 23	134 (12 – 350)	60 (16 – 130)	24 (8 – 44)	49 (18 – 84)	198 (44 – 460)	21 (4 – 40)	49 (12 – 104)	50 (0 – 142)	17 (4 – 32)	57 (0 – 151)	132 (52 – 232)	162 (97 – 246)
Kittiwake	Mar 21-Feb 22	27 (7 – 55)	53 (16 – 95)	611 (419 – 839)	221 (142 – 308)	423 (181 – 765)	417 (155 – 860)	217 (75 – 463)	2895 (681 – 5772)	3247 (1122 – 5937)	85 (40 – 135)	385 (243 – 563)	111 (76 – 144)
	Mar 22-Feb 23	105 (61 – 153)	236 (172 – 300)	511 (423 – 601)	998 (398 – 2060)	1015 (450 – 1968)	497 (362 – 633)	1290 (737 – 1987)	649 (473 – 850)	874 (564 – 1358)	317 (131 – 535)	433 (317 – 568)	386 (265 – 516)
Lesser black backed gull	Mar 21-Feb 22	5 (0 – 12)	17 (4 – 32)	5 (0 – 12)	0	4 (0 – 12)	0	33 (12 – 56)	129 (23 – 280)	136 (37 – 264)	5 (0 – 12)	0	0

Species	Year	J*	F	M	A	M	J	J	A	S	O	N	D
	Mar 22-Feb 23	4 (0 – 12)	0	17 (0 – 36)	9 (0 – 20)	67 (13 – 148)	5 (0 – 12)	71 (34 – 115)	55 (20 – 97)	55 (8 – 119)	15 (0 – 40)	9 (0 – 20)	0
Little gull	Mar 21-Feb 22	12 (0 – 24)	13 (0 – 28)	36 (12 – 60)	0	0	0	0	0	0	0	13 (0 – 32)	9 (0 – 21)
	Mar 22-Feb 23	108 (43 – 185)	363 (196 – 554)	4 (0 – 12)	21 (8 – 36)	0	0	0	0	0	5 (0 – 13)	24 (4 – 49)	239 (170 – 308)
Manx shearwater	Mar 21-Feb 22	0	0	0	25 (0 – 60)	43 (8 – 92)	0	8699 (4654 – 13401)	3926 (2463 – 5760)	8 (0 – 21)	0	0	0
	Mar 22-Feb 23	0	0	0	15 (0 – 33)	3697 (2183 – 5499)	2403 (711 – 4549)	1948 (1088 – 2921)	3344 (2004 – 4847)	786 (98 – 2087)	0	0	0
Puffin	Mar 21-Feb 22	0	0	12 (3 – 22)	29 (5 – 58)	0	0	85 (50 – 123)	45 (19 – 77)	0	0	9 (2 – 20)	0
	Mar 22-Feb 23	0	0	0	16 (2 – 38)	33 (12 – 56)	12 (0 – 30)	0	0	3 (0 – 6)	16 (5 – 29)	41 (16 – 68)	0
Razorbill	Mar 21-Feb 22	164 (64 – 299)	524 (367 – 683)	736 (403 – 1181)	350 (150 – 606)	32 (11 – 62)	12 (0 – 29)	40 (15 – 73)	21 (1 – 49)	9 (0 – 24)	924 (555 – 1344)	471 (272 – 710)	126 (70 – 192)
	Mar 22-Feb 23	330 (197 – 482)	780 (543 – 1050)	525 (354 – 706)	265 (147 – 392)	175 (111 – 242)	255 (31 – 660)	35 (10 – 65)	0	1 (0 – 1)	799 (435 – 1275)	244 (127 – 373)	1282 (868 – 1702)

Species	Year	J*	F	M	A	M	J	J	A	S	O	N	D
Red-throated diver (square brackets = windfarm site + 10km estimated population)	Mar 21-Feb 22	0 [0]	4 (0–-12) [9 (0–-20)]	0 [0]	0 [8 (0–-20)]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	5 (0–-12) [8 (0–-20)]	12 (0 – 28) [51 (16–-90)]
	Mar 22-Feb 23	0 [24 (0–-57)]	0 [24 (4–-49)]	8 (0–-20) [64 (24–-116)]	0 [0]	0 [5 (0–-13)]	0 [0]	0 [0]	0 [0]	0 [0]	0 [0]	0 [5 (0–-13)]	12 (0 – 27) [5 (0 – 12)]
Sandwich tern	Mar 21-Feb 22	0	0	0	0	0	0	0	0	43 (0 – 99)	13 (0 – 36)	0	0
	Mar 22-Feb 23	0	0	0	0	0	4 (0 – 12)	9 (0 – 31)	0	16 (0 – 36)	0	0	0
Shag	Mar 21-Feb 22	0	0	0	0	0	0	0	0	0	0	0	0
	Mar 22-Feb 23	0	0	0	0	0	0	0	8 (0 – 24)	0	0	0	0
Snipe	Mar 21-Feb 22	0	0	0	0	0	0	0	0	0	8 (0 – 24)	0	0
	Mar 22-Feb 23	0	0	0	0	0	0	0	0	0	0	0	0

* The January 2023 survey was delayed to early February 2023 due to lack of available weather windows, therefore two surveys were carried out in February 2023 to compensate. This was discussed and agreed with Natural England via the ETG process. The early February 2023 survey data are presented in the January column, and the late February 2023 data are presented in the February column.

8.3.1 Biologically relevant seasons for seabirds

215. Biologically relevant seasons for each seabird species recorded during the aerial surveys are given in **Table 8.3**. Depending on evidence for patterns of movement, the non-breeding season for some species was sub-divided into spring and autumn migration and winter periods.

216. Species-specific seasons were from Furness (2015), except for common scoter, black-headed gull, common gull and little gull, which were based on Cramp and Simmons (1983).

Table 8.3 Biologically relevant seasons for seabird species

Species	Season				
	Breeding	Migration-free breeding	Autumn migration	Winter/non-breeding	Spring migration
Arctic skua	May-Jul	Jun-Jul	Aug-Oct	Nov-Mar	Apr-May
Arctic tern	May-e.Aug	Jun	Jul-e.Sep	Oct-Mar	Apr-May
Black-headed gull	Apr-Jul	n/a	n/a	Aug-Mar	n/a
Common gull	May-Jul	n/a	n/a	Aug-Apr	n/a
Common scoter	Jun-Sep	n/a	Sep-Dec	Oct-May	Feb-Jun
Common tern	May-Aug	Jun-m.Jul	l.Jul-e.Sep	n/a	Apr-May
Cormorant	Apr-Aug	n/a	n/a	Sep-Mar	n/a
Fulmar	Jan-Aug	Apr-Aug	Sep-Oct	Nov	Dec-Mar
Gannet	Mar-Sep	Apr-Aug	Sep-Nov	n/a	Dec-Mar
Great black-backed gull	l.Mar-Aug	n/a	n/a	Sep-Mar	n/a
Great skua	May-Aug	May-Jul	Aug-Oct	Nov-Feb	Mar-Apr
Guillemot	Mar-Jul	n/a	n/a	Aug-Feb	n/a
Herring gull	Mar-Aug	n/a	n/a	Sep-Feb	n/a
Kittiwake	Mar-Aug	May-Jul	Aug-Dec	n/a	Jan-Apr
Lesser black-backed gull	Apr-Aug	May-Jul	Aug-Oct	Nov-Feb	Mar-Apr
Little gull	Apr-Jul	n/a	n/a	Aug-Apr	n/a
Manx shearwater	Apr-Aug	Jun-Jul	Aug-e.Oct	Nov-Feb	l.Mar-m.May

Species	Season				
	Breeding	Migration-free breeding	Autumn migration	Winter/non-breeding	Spring migration
Puffin	Apr-e.Aug	n/a	n/a	m.Aug-Mar	n/a
Razorbill	Apr-Jul	Apr-Jun	Aug-Oct	Nov-Dec	Jan-Mar
Red-throated diver	Mar-Aug	May-Aug	Sep-Nov	Dec-Jan	Feb-Apr
Sandwich tern	Apr-Aug	Jun	Jul-Sep	n/a	Mar-May
Shag	Feb-Aug (occ -Oct)	Mar-Jul	Aug-Oct	Nov	Dec-Feb
[1]Prefixes: e. = early in month, m. = mid-month and l. = late month, occ. = occasionally					

8.4 Identification of sites and features for screening

217. The breeding season is the time when breeding seabirds are constrained to habitat within their foraging ranges and considered most likely to be susceptible to effects due to the construction, operation and maintenance and decommissioning of the Project. For SPAs for breeding seabirds, published information on foraging ranges of seabirds during the breeding season (Woodward *et al.*, 2019) was used to establish the likelihood of connectivity between the qualifying features of the SPA and the windfarm site (**Table 8.4**).

218. The mean maximum foraging range (+1 standard deviation (SD)) for a species is generally considered to be the most appropriate measure in identifying spatial overlap between an OWF and the probable foraging grounds of a breeding seabird colony, and therefore connectivity between the colony and the habitat where the OWF is located. Breeding seabird species which are qualifying features of SPAs and Ramsar Sites within the species-specific mean maximum foraging range of the windfarm site, and which were recorded in the survey area during the breeding season, were screened in, unless there was a justifiable biological reason for them being screened out. Such reasons would include the availability of information on the foraging ranges of species from particular breeding colonies which suggests that birds from a given colony would be unlikely to occur at the windfarm site (this relates, for example, to evidence for parapatric competition between kittiwake, guillemot and gannet colonies during the breeding season (Wakefield *et al.*, 2017, 2013), such that the foraging areas of birds from different colonies do not tend to overlap). Therefore, in some cases, utilisation distributions of key species (Cleasby *et al.*, 2020, 2018; Wakefield *et al*., 2017) were considered to assess

the likely origin of particular species recorded within the baseline survey area for the Project.

Table 8.4 Mean maximum and maximum foraging ranges (Woodward et al., 2019) from breeding colonies for seabird species considered in the HRA screening

Species	Mean maximum foraging range (± SD)[1] (km)	Maximum foraging range +1SD (km)
Arctic skua	2 (± 0.7)	3
Arctic tern	25.7 (± 14.8)	41
Black-headed gull	18.5 (no S.D.)	19
Common gull	50 (no S.D.)	50
Common tern	18.0 (± 8.9)	27
Cormorant	25.6 (± 8.3)	34
European storm-petrel	336 (no S.D.)	336
Fulmar	542.3 (± 657.9)	1,200
Gannet	315.2 (± 194.2)	509
Great black-backed gull	73 (no S.D.)	73
Great skua	443.3 (± 487.9)	931
Guillemot	73.2 (± 80.5)	154
Herring gull	58.8 (± 26.8)	86
Kittiwake	156.1 (± 144.5)	301
Leach's storm-petrel	657 (mean foraging range)	Not available
Lesser black-backed gull	127.0 (± 109)	236
Little tern	5 (no S.D.)	5
Manx shearwater	1346.8 (± 1018.7)	2366
Puffin	137.1 (± 128.3)	265
Razorbill	88.7 (± 75.9)	165
Red-throated diver	9 (no S.D.)	9
Sandwich tern	34.3 (± 23.2)	58
Shag	13.2 (± 10.5)	24

[1] The mean maximum foraging range for a species is the mean of the maximum foraging ranges recorded from each breeding colony for which foraging range data were available.

8.4.1 Seabirds non-breeding season

219. Outside the breeding season, seabirds are unconstrained by requirements to attend nests and disperse over much greater distances than breeding season foraging ranges from their colonies allow. During the non-breeding season, breeding adults from SPA colonies, which are more distant from the windfarm site, may utilise habitats in and around the windfarm site, meaning that they are at risk of effects during construction, operation and maintenance and/or decommissioning, which would not have presented such a risk during the breeding season. These breeding adults are assumed to mix evenly with non-breeding birds, which may be immature or sub-adults (most seabirds take several years to reach breeding age so that large proportions of the populations are sub-adult). In turn, this population is then assumed to mix evenly with seabirds from other colonies. BDMPS and total population estimates for UK seabirds outside the breeding season were described by Furness (2015), along with approximate seasonal movement patterns. BDMPS areas are extensive and overall population sizes for individual species are generally large, consisting of the combined populations of many seabird colonies from both the UK and overseas.

220. For most seabird species, there are two general BDMPS regions defined within UK waters, the main division being between the North Sea and western waters. For some species, however, there are up to five BDMPS regions (Furness, 2015).

221. For seabird species covered by Furness (2015), the non-breeding season BDMPS region was used to identify the Area of Search (AoS) for UK SPAs and Ramsar Sites with potential connectivity with the Project. For these species, the contributions of UK (SPA and non-SPA) and overseas populations to the relevant BDMPS, from Furness (2015), were used to estimate the peak seasonal population from each SPA within the relevant BDMPS region (i.e. within which the windfarm site is located). From this, the percentage of the SPA population estimated to be present within the BDMPS region during the non-breeding season was calculated. These are presented in **Table 8.5** (including relevant assemblage species). BDMPS region totals for some species differ seasonally (e.g. some species have different totals for autumn and spring passage periods and winter periods); therefore, where the contribution of a given SPA population towards the BDMPS total varies by season, the highest value was reported. For transboundary sites in the Republic of Ireland, the population for each site/species has been taken from the SPA citation and used to calculate the contribution to the relevant BDMPS population, as above. This data was not included in **Table 8.5**, but is available on request.

222. As a conservative approach, potential connectivity has been assumed for any SPA population which contributes to 1% or more of the BDMPS region total, and therefore 1% or more of the birds recorded at the windfarm site could occur during all or part of the non-breeding season. These populations, which are coloured in red in **Table 8.5**, were included in the main screening table (see **Appendix 3** in **Section 1**), and for completeness, were assessed during the breeding and non-breeding season, along with other qualifying features of the SPA in question. Those populations where the 1% threshold is not met were not considered further by the assessment.

Table 8.5 SPA qualifying species population contributions to the relevant non-breeding BDMPS population (%)[12]

SPA	Red-throated diver	Fulmar	Manx shearwater	Gannet	Cormorant	Shag	Great skua	Lesser black-backed gull	Herring gull	Great black-backed gull	Kittiwake	Roseate tern	Sandwich tern	Common tern	Arctic tern	Little tern	Guillemot	Razorbill	Puffin
Ailsa Craig				16.4				0.2	0.2		0.2						1.6		
Alde-Ore Estuary								0.1	0.0							0.0			
Auskerry															0.3				
Bowland Fells								5.2											
Breydon Water														0.1					
Buchan Ness to Collieston Coast		0.1				0.0			0.0		1.7								
Calf of Eday		0.1			0.0						0.1						0.1		
Canna and Sanday						0.0			0.1		0.3						1.1		0.1
Cape Wrath		0.8									3.4						7.8	1.1	0.2

[12] Red figures show values>1%

SPA	Red-throated diver	Fulmar	Manx shearwater	Gannet	Cormorant	Shag	Great skua	Lesser black-backed gull	Herring gull	Great black-backed gull	Kittiwake	Roseate tern	Sandwich tern	Common tern	Arctic tern	Little tern	Guillemot	Razorbill	Puffin
Carlingford Lough													0.0	0.5					
Copinsay		0.1									0.1						0.1		
Coquet Island												0.0		1.4	0.1				0.7
Cromarty Firth														0.1					
Dungeness to Pett Level														0.1					
East Caithness Cliffs		1.1			0.0	0.0			0.0		5.6							0.2	0.0
Fair Isle		2.4		0.6		0.0	2.2		0.0		0.1				0.0		0.1	0.0	0.7
Farne Islands					0.0	0.0					0.5	0.0		0.1	0.2		0.0		2.4
Fetlar		0.7					4.9								0.0				
Flamborough and Filey Coast		0.1		1.8							5.2							0.1	0.1
Flannan Isles		2.6									0.5						2.8	0.6	2.1
Forth Islands		0.1		9.1	0.0	0.0		0.1	0.0		0.4			0.0	0.0			0.0	3.7

SPA	Red-throated diver	Fulmar	Manx shearwater	Gannet	Cormorant	Shag	Great skua	Lesser black-backed gull	Herring gull	Great black-backed gull	Kittiwake	Roseate tern	Sandwich tern	Common tern	Arctic tern	Little tern	Guillemot	Razorbill	Puffin
Foula	0.1	1.6				0.0	13.9				0.0				0.0		0.2	0.0	1.5
Foulness														0.0		0.0			
Fowlsheugh		0.0							0.0		1.3							0.1	
Glannau Aberdaron ac Ynys Enlli/Aberdaron Coast and Bardsey Island			3.3																
Glas Eileanan														0.1					
Grassholm				23.7															
Handa		0.7					2.6				0.6						10.8	2.8	
Hermaness, Saxavord and Valla Field	0.1	0.6		4.0		0.0	8.2				0.1						0.0		1.6
Hoy	0.4	1.6					11.3			0.0	0.0						0.1		0.2

SPA	Red-throated diver	Fulmar	Manx shearwater	Gannet	Cormorant	Shag	Great skua	Lesser black-backed gull	Herring gull	Great black-backed gull	Kittiwake	Roseate tern	Sandwich tern	Common tern	Arctic tern	Little tern	Guillemot	Razorbill	Puffin
Imperial Dock Lock Leith														1.1					
Isles of Scilly						45.9		5.4		18.1									
Larne Lough												0.0	6.9	0.9					
Lindisfarne																0.0			
Lough Neagh and Lough Beg														0.3					
Marwick Head											0.1						0.1		
Mingulay and Berneray		3.3				0.0					0.7						3.8	5.5	0.4
Monach Isles																0.3			
Morecambe Bay and Duddon Estuary								5.7	3.1				0.1			10.4			
Morwenoliaid Ynys Môn/Anglesey Terns														0.7	2.2				

SPA	Red-throated diver	Fulmar	Manx shearwater	Gannet	Cormorant	Shag	Great skua	Lesser black-backed gull	Herring gull	Great black-backed gull	Kittiwake	Roseate tern	Sandwich tern	Common tern	Arctic tern	Little tern	Guillemot	Razorbill	Puffin
Mousa															0.0				
North Caithness Cliffs		1.1									1.4						0.5	0.0	0.1
North Colonsay and Western Cliffs											1.9						4.0		
North Norfolk Coast														0.3					
North Rona and Sula Sgeir		1.8		5.0						0.3	0.4						1.4	0.6	0.7
Northumbria Coast																0.0			
Noss		0.4		1.6			3.9				0.1						0.1		0.1
Papa Stour															0.5				
Papa Westray															0.1				
Pentland Firth Islands															0.0				
Poole Harbour														0.2					

SPA	Red-throated diver	Fulmar	Manx shearwater	Gannet	Cormorant	Shag	Great skua	Lesser black-backed gull	Herring gull	Great black-backed gull	Kittiwake	Roseate tern	Sandwich tern	Common tern	Arctic tern	Little tern	Guillemot	Razorbill	Puffin
Puffin Island					10.0														
Rathlin Island		0.5						0.1	0.1		2.6						26.1	8.4	0.1
Ribble and Alt Estuaries								9.4						0.4					
Ronas Hill, North Roe	0.4						1.6												
Rousay		0.1									0.2				0.0		0.1		
Rum	0.5		24.1								0.3						0.5		
Sgomer, Sgogwm a Moroedd Penfro/Skomer, Skokholm and the Seas off Pembrokeshire			70.3					11.5			0.3						4.3	3.3	3.2
Sheep Island (NI)					1.6														
Shiant Isles		1.6				0.0					0.2						1.5	2.3	8.6

SPA	Red-throated diver	Fulmar	Manx shearwater	Gannet	Cormorant	Shag	Great skua	Lesser black-backed gull	Herring gull	Great black-backed gull	Kittiwake	Roseate tern	Sandwich tern	Common tern	Arctic tern	Little tern	Guillemot	Razorbill	Puffin
Solent and Southampton Water														0.4					
St Abbs to Fast Castle						0.0			0.0		0.5							0.0	
St Kilda		23.9	1.0	32.0			3.5				0.3						4.5	0.9	18.8
Strangford Lough													20.6	1.4	0.6				
Sule Skerry and Sule Stack				2.5		0.0											2.2		7.8
Sumburgh		0.0									0.0				0.1		0.0		
Teesmouth and Cleveland Coast SPA																0.0			
The Dee Estuary														0.7		21.0			
The Wash														0.3					

SPA	Red-throated diver	Fulmar	Manx shearwater	Gannet	Cormorant	Shag	Great skua	Lesser black-backed gull	Herring gull	Great black-backed gull	Kittiwake	Roseate tern	Sandwich tern	Common tern	Arctic tern	Little tern	Guillemot	Razorbill	Puffin
Troup, Pennan and Lion's Head		0.1							0.0		2.1							0.0	
Outer Ards															0.2				
West Westray		0.1									1.7				0.2		0.3	0.0	
Ythan Estuary, Sands of Forvie													0.0	0.0		0.0			

8.4.2 Migratory birds other than seabirds

223. In addition to seabirds, other offshore ornithology receptors that migrate across areas of open sea may encounter OWFs and be at risk of collision if they fly through a turbine array, or barrier effects if they avoid turbine arrays. Of the receptors, only two species of wader have been detected during the baseline surveys (dunlin and snipe), although, as with surveys at all OWFs in UK waters, the design of the baseline surveys was such that the numbers of a given migratory species passing through a site may be underestimated. This is because non-seabird species may migrate across offshore areas in large numbers over relatively restricted time periods (a few days or weeks), and sometimes at high altitude and/or at night. Thus, it is likely that the majority of migratory species passing through an offshore area would not be captured by monthly surveys during daylight hours.

224. Screening considered relevant qualifying features of SPAs and Ramsar Sites within approximately 100km of the Project. It was considered that 100km represents a reasonable cut-off point, based on professional judgement. The probability that a large enough number of waders, wildfowl or other migrants, from a particular SPA located in excess of 100km from the windfarm site could pass through the site in numbers sufficient to result in an LSE was considered to be very unlikely.

8.4.3 Transboundary European sites

225. As well as UK SPAs and Ramsar Sites, screening considered transboundary European sites designated by other European countries for birds, where the distance between the transboundary site and the windfarm site was such that an effect on the SPA's qualifying species might be possible, based on the criteria identified above. The transboundary screening considered relevant sites within the Republic of Ireland and Isle of Man; sites elsewhere in Europe were considered too distant for an LSE to occur and were therefore excluded from the screening assessment.

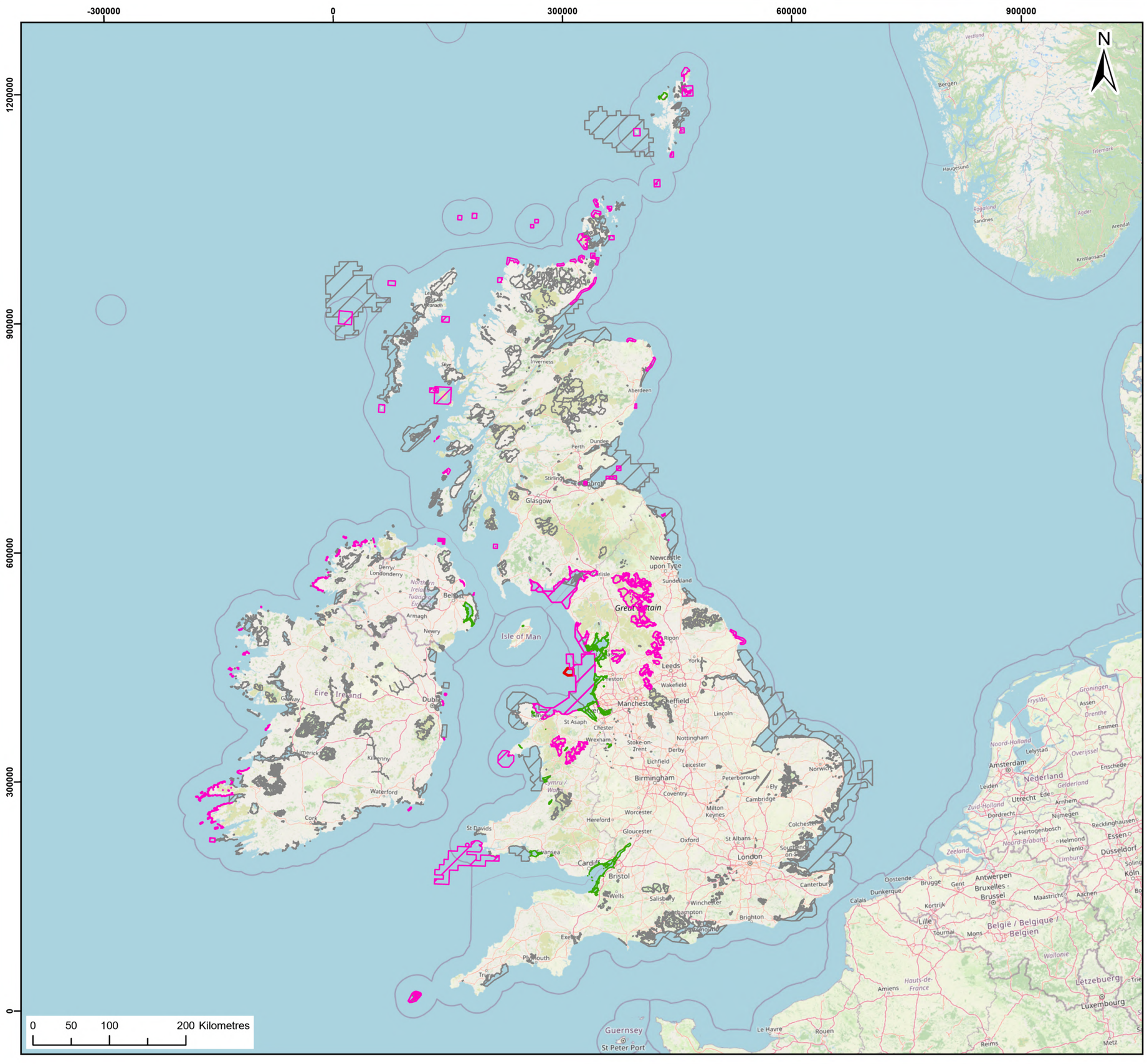
8.5 Screening

226. The list of SPAs and Ramsar Sites considered in screening for LSE in respect of offshore ornithology is included in **Appendix 2** in **Section 12** for UK sites and **Appendix 3** in **Section 1** for transboundary sites. These SPAs and Ramsar Sites are listed in order of increasing distance from the windfarm site. This screening has identified effects arising from the Project (i.e., the wind turbine array and associated infrastructure) alone and in-combination.

227. SPAs and Ramsar Sites were screened in where LSE could not be ruled out for one or more qualifying features and screened out where LSE could be ruled

out for all qualifying features. A rationale is given for each SPA or Ramsar Site and qualifying feature to explain the screening decision. **Figure 8.2** shows the sites screened in and out from further assessment.

228. It should be noted that the relatively small area occupied by the windfarm site, when considered alongside the foraging ranges of the offshore ornithology features under consideration (**Table 8.4**), suggests that LSE due to indirect effects (via prey species or habitats) on these features is highly unlikely for foraging birds. These were therefore not included in **Appendix 2** in **Section 12** and **Appendix 3** in **Section 1**, although they have been considered.



Legend:

- Morecambe Offshore Windfarm Site
- Ramsar Screened In
- Special Protection Areas (SPA) Screened In
- Sites Screened Out

Report: Morecambe Offshore Windfarm: Generation Assets HRA Screening

Title: European sites screened in or out of the HRA with respect to seabirds

Figure: 8.2 | Drawing No: PC1165-RHD-ZZ-OF-DR-Z-0092

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
P02	18/08/2022	JT	GC	A3	1:5,000,000
P03	01/03/2024	JH	GC	A3	1:5,000,000

Co-ordinate system: WGS 1984 UTM Zone 30N

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9 Summary

9.1 Benthic ecology screening summary

229. The HRA screening for benthic ecology (**Section** 5) identified one site where LSE cannot be ruled out:

- Shell Flat and Lune Deep SAC

9.2 Fish ecology screening summary

230. The HRA screening for fish ecology (**Section** 6) identified four sites where LSE cannot be ruled out:

- Dee Estuary/Aber Dyfrdwy SAC
- River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid
- Afon Gwyrfai a Llyn Cwellyn SAC
- Afon Eden - Cors Goch Trawsfynydd SAC

231. Following consultation on the draft screening, the following sites where identified where LSE cannot be ruled out:

- River Ehen SAC
- Solway Firth SAC
- River Derwent and Bassenthwaite Lake SAC

9.3 Marine mammals screening summary

232. The HRA screening for marine mammals considered habitats and sites and potential in-combination effects within the relevant reference populations for each species as defined in **Section** 7.

233. The following sites where harbour porpoise is a qualifying feature were screened in for further assessment:

- North Anglesey Marine SAC
- North Channel SAC
- West Wales Marine SAC
- Rockabill to Dalkey Island SAC
- Bristol Channel Approaches

234. For sites where bottlenose dolphin is a qualifying feature are:

- Pen Llŷn a`r Sarnau SAC
- Cardigan Bay SAC

235. For grey seal and harbour seal there were no designated sites within the known average foraging ranges for the species, but as a precautionary

approach the nearest sites designated for harbour and grey seals were screened in for further assessment:

- Pen Llŷn a`r Sarnau SAC
- Strangford Lough SAC

9.4 Ornithology screening summary

236. The screening of Annex II offshore ornithology features considered qualifying features for European sites. Screening was initially undertaken based on the first year of aerial survey data, and checked against the second year of data for any additional European sites to be screened in.

237. The European sites screened in for further assessment for the Project are provided in **Appendix 2** in **Section 12** for UK sites and **Appendix 3** in **Section 1** for transboundary sites. A summary table is provided in **Table 9.1** below of European sites screened in.

Table 9.1 Ornithology screening - summary of European sites screened in

European Site	Qualifying feature
Liverpool Bay/Bae Lerpwl SPA	Red-throated diver
Liverpool Bay/Bae Lerpwl SPA	Black (common) scoter
Liverpool Bay/Bae Lerpwl SPA	Little gull
Liverpool Bay/Bae Lerpwl SPA	Common tern
Morecambe Bay and Duddon Estuary SPA and Ramsar Site	Little egret
Morecambe Bay and Duddon Estuary SPA and Ramsar Site	Whooper swan
Morecambe Bay and Duddon Estuary SPA and Ramsar Site	Pink-footed goose
Morecambe Bay and Duddon Estuary SPA and Ramsar Site	Common shelduck
Morecambe Bay and Duddon Estuary SPA and Ramsar Site	Northern pintail
Morecambe Bay and Duddon Estuary SPA and Ramsar Site	Eurasian oystercatcher
Morecambe Bay and Duddon Estuary SPA and Ramsar Site	Ringed plover
Morecambe Bay and Duddon Estuary SPA and Ramsar Site	European golden plover
Morecambe Bay and Duddon Estuary SPA and Ramsar Site	Grey plover

European Site	Qualifying feature
Morecambe Bay and Duddon Estuary SPA and Ramsar Site	Red knot
Morecambe Bay and Duddon Estuary SPA and Ramsar Site	Sanderling
Morecambe Bay and Duddon Estuary SPA and Ramsar Site	Ruff
Morecambe Bay and Duddon Estuary SPA and Ramsar Site	Bar-tailed godwit
Morecambe Bay and Duddon Estuary SPA and Ramsar Site	Eurasian curlew
Morecambe Bay and Duddon Estuary SPA and Ramsar Site	Common redshank
Morecambe Bay and Duddon Estuary SPA and Ramsar Site	Ruddy turnstone
Morecambe Bay and Duddon Estuary SPA and Ramsar Site	Mediterranean gull
Morecambe Bay and Duddon Estuary SPA and Ramsar Site	Lesser black-backed gull
Morecambe Bay and Duddon Estuary SPA and Ramsar Site	Black-tailed godwit
Morecambe Bay and Duddon Estuary SPA and Ramsar Site	Dunlin
Morecambe Bay and Duddon Estuary SPA and Ramsar Site	Herring gull
Morecambe Bay and Duddon Estuary SPA and Ramsar Site	Sandwich tern
Morecambe Bay and Duddon Estuary SPA and Ramsar Site	Common tern
Morecambe Bay and Duddon Estuary SPA and Ramsar Site	Seabird assemblage
Morecambe Bay and Duddon Estuary SPA and Ramsar Site	Waterbird assemblage
Ribble and Alt Estuaries SPA and Ramsar Site	Tundra (Bewick's) swan
Ribble and Alt Estuaries SPA and Ramsar Site	Whooper swan
Ribble and Alt Estuaries SPA and Ramsar Site	Pink-footed goose
Ribble and Alt Estuaries SPA and Ramsar Site	Common shelduck
Ribble and Alt Estuaries SPA and Ramsar Site	Eurasian wigeon

European Site	Qualifying feature
Ribble and Alt Estuaries SPA and Ramsar Site	Eurasian teal
Ribble and Alt Estuaries SPA and Ramsar Site	Northern pintail
Ribble and Alt Estuaries SPA and Ramsar Site	Eurasian oystercatcher
Ribble and Alt Estuaries SPA and Ramsar Site	Ringed plover
Ribble and Alt Estuaries SPA and Ramsar Site	European golden plover
Ribble and Alt Estuaries SPA and Ramsar Site	Grey plover
Ribble and Alt Estuaries SPA and Ramsar Site	Red knot
Ribble and Alt Estuaries SPA and Ramsar Site	Sanderling
Ribble and Alt Estuaries SPA and Ramsar Site	Bar-tailed godwit
Ribble and Alt Estuaries SPA and Ramsar Site	Common redshank
Ribble and Alt Estuaries SPA and Ramsar Site	Black-tailed godwit
Ribble and Alt Estuaries SPA and Ramsar Site	Dunlin
Ribble and Alt Estuaries SPA and Ramsar Site	Ruff
Ribble and Alt Estuaries SPA and Ramsar Site	Lesser black-backed gull
Ribble and Alt Estuaries SPA and Ramsar Site	Common tern
Ribble and Alt Estuaries SPA and Ramsar Site	Seabird assemblage
Ribble and Alt Estuaries SPA and Ramsar Site	Waterbird assemblage
Mersey Narrows and North Wirral Foreshore SPA and Ramsar Site	Bar-tailed godwit
Mersey Narrows and North Wirral Foreshore SPA and Ramsar Site	Little gull
Mersey Narrows and North Wirral Foreshore SPA and Ramsar Site	Common tern
Mersey Narrows and North Wirral Foreshore SPA and Ramsar Site	Red knot

European Site	Qualifying feature
Mersey Narrows and North Wirral Foreshore SPA and Ramsar Site	Common tern
Mersey Narrows and North Wirral Foreshore SPA and Ramsar Site	Waterbird assemblage
Martin Mere SPA and Ramsar Site	Tundra (Bewick's) swan
Martin Mere SPA and Ramsar Site	Whooper swan
Martin Mere SPA and Ramsar Site	Pink-footed goose
Martin Mere SPA and Ramsar Site	Eurasian teal
Martin Mere SPA and Ramsar Site	Northern pintail
Martin Mere SPA and Ramsar Site	Eurasian wigeon
Martin Mere SPA and Ramsar Site	Waterbird assemblage
The Dee Estuary SPA and Ramsar Site	Common shelduck
The Dee Estuary SPA and Ramsar Site	Eurasian teal
The Dee Estuary SPA and Ramsar Site	Northern pintail
The Dee Estuary SPA and Ramsar Site	Eurasian oystercatcher
The Dee Estuary SPA and Ramsar Site	Grey plover
The Dee Estuary SPA and Ramsar Site	Red knot
The Dee Estuary SPA and Ramsar Site	Bar-tailed godwit
The Dee Estuary SPA and Ramsar Site	Eurasian curlew
The Dee Estuary SPA and Ramsar Site	Common redshank
The Dee Estuary SPA and Ramsar Site	Sandwich tern
The Dee Estuary SPA and Ramsar Site	Black-tailed godwit
The Dee Estuary SPA and Ramsar Site	Dunlin
The Dee Estuary SPA and Ramsar Site	Common tern
The Dee Estuary SPA and Ramsar Site	Waterbird assemblage
Anglesey Terns/Morwenoliaid Ynys Môn SPA	Sandwich tern
Anglesey Terns/Morwenoliaid Ynys Môn SPA	Common tern
Anglesey Terns/Morwenoliaid Ynys Môn SPA	Arctic tern
Bowland Fells SPA	Hen harrier

European Site	Qualifying feature
Bowland Fells SPA	Merlin
Bowland Fells SPA	Lesser black-backed gull
Mersey Estuary SPA and Ramsar Site	Great crested grebe
Mersey Estuary SPA and Ramsar Site	Common shelduck
Mersey Estuary SPA and Ramsar Site	Eurasian wigeon
Mersey Estuary SPA and Ramsar Site	Eurasian teal
Mersey Estuary SPA and Ramsar Site	Northern pintail
Mersey Estuary SPA and Ramsar Site	Ringed plover
Mersey Estuary SPA and Ramsar Site	European golden plover
Mersey Estuary SPA and Ramsar Site	Grey plover
Mersey Estuary SPA and Ramsar Site	Northern lapwing
Mersey Estuary SPA and Ramsar Site	Eurasian curlew
Mersey Estuary SPA and Ramsar Site	Common redshank (passage)
Mersey Estuary SPA and Ramsar Site	Common redshank (wintering)
Mersey Estuary SPA and Ramsar Site	Black-tailed godwit
Mersey Estuary SPA and Ramsar Site	Dunlin
Mersey Estuary SPA and Ramsar Site	Waterbird assemblage
Leighton Moss Ramsar Site	Waterbird assemblage
Leighton Moss Ramsar Site	Wetland bird assemblage
Traeth Lafan/Lavan Sands, Conway Bay SPA	Great crested grebe
Traeth Lafan/Lavan Sands, Conway Bay SPA	Red-breasted merganser
Traeth Lafan/Lavan Sands, Conway Bay SPA	Eurasian oystercatcher
Traeth Lafan/Lavan Sands, Conway Bay SPA	Eurasian curlew
Traeth Lafan/Lavan Sands, Conway Bay SPA	Common redshank
Solway Firth SPA	Red-throated diver
Solway Firth SPA	Great cormorant
Solway Firth SPA	Whooper swan

European Site	Qualifying feature
Solway Firth SPA	Pink-footed goose
Solway Firth SPA	Barnacle goose
Solway Firth SPA	Common shelduck
Solway Firth SPA	Eurasian teal
Solway Firth SPA	Northern pintail
Solway Firth SPA	Northern shoveler
Solway Firth SPA	Greater scaup
Solway Firth SPA	Black (common) scoter
Solway Firth SPA	Common goldeneye
Solway Firth SPA	Goosander
Solway Firth SPA	Eurasian oystercatcher
Solway Firth SPA	Ringed plover
Solway Firth SPA	European golden plover
Solway Firth SPA	Grey plover
Solway Firth SPA	Northern lapwing
Solway Firth SPA	Red knot
Solway Firth SPA	Sanderling
Solway Firth SPA	Bar-tailed godwit
Solway Firth SPA	Eurasian curlew
Solway Firth SPA	Common redshank
Solway Firth SPA	Ruddy turnstone
Solway Firth SPA	Black-headed gull
Solway Firth SPA	Mew (common) gull
Solway Firth SPA	Herring gull
Solway Firth SPA	Dunlin
Migneint-Arenig-Dduallt SPA	Hen harrier
Migneint-Arenig-Dduallt SPA	Merlin
Migneint-Arenig-Dduallt SPA	Peregrine falcon
Berwyn SPA	Red kite

European Site	Qualifying feature
Berwyn SPA	Hen harrier
Berwyn SPA	Merlin
Berwyn SPA	Peregrine falcon
South Pennine Moors Phase 2 SPA	Merlin
South Pennine Moors Phase 2 SPA	European golden plover
South Pennine Moors Phase 2 SPA	Short-eared owl
North Pennine Moors SPA	Hen harrier
North Pennine Moors SPA	Merlin
North Pennine Moors SPA	Peregrine falcon
North Pennine Moors SPA	European golden plover
Glannau Aberdaron ac Ynys Enlli/Aberdaron Coast and Bardsey Island SPA	Manx shearwater
Strangford Lough SPA and Ramsar Site	Sandwich tern
Strangford Lough SPA and Ramsar Site	Common tern
Copeland Islands SPA	Manx shearwater
Larne Lough SPA and Ramsar Site	Sandwich tern
Ailsa Craig SPA	Northern gannet
Ailsa Craig SPA	Lesser black-backed gull
Ailsa Craig SPA	Black-legged kittiwake
Ailsa Craig SPA	Herring gull
Ailsa Craig SPA	Common guillemot
Ailsa Craig SPA	Seabird assemblage
Coquet Island SPA	Common tern
Coquet Island SPA	Seabird assemblage
Flamborough and Filey Coast SPA	Northern gannet
Flamborough and Filey Coast SPA	Black-legged kittiwake
Flamborough and Filey Coast SPA	Seabird assemblage
Rathlin Island SPA	Black-legged kittiwake
Rathlin Island SPA	Common guillemot

European Site	Qualifying feature
Rathlin Island SPA	Razorbill
Rathlin Island SPA	Seabird assemblage
Sheep Island SPA	Great cormorant
Farne Islands SPA	Seabird assemblage
Forth Islands SPA	Northern gannet
Forth Islands SPA	Atlantic puffin
Forth Islands SPA	Seabird assemblage
Skomer, Skokholm and the Seas off Pembrokeshire/Sgomer, Sgogwm a Moroedd Penfro SPA	Manx shearwater
Skomer, Skokholm and the Seas off Pembrokeshire/Sgomer, Sgogwm a Moroedd Penfro SPA	European storm-petrel
Skomer, Skokholm and the Seas off Pembrokeshire/Sgomer, Sgogwm a Moroedd Penfro SPA	Atlantic puffin
Skomer, Skokholm and the Seas off Pembrokeshire/Sgomer, Sgogwm a Moroedd Penfro SPA	Lesser black-backed gull
Skomer, Skokholm and the Seas off Pembrokeshire/Sgomer, Sgogwm a Moroedd Penfro SPA	Seabird assemblage
Grassholm SPA	Northern gannet
North Colonsay and Western Cliffs SPA	Black-legged kittiwake
North Colonsay and Western Cliffs SPA	Common guillemot
North Colonsay and Western Cliffs SPA	Seabird assemblage
Treshnish Isles SPA	European storm-petrel
Fowlsheugh SPA	Northern fulmar
Fowlsheugh SPA	Black-legged kittiwake
Fowlsheugh SPA	Seabird assemblage
Rum SPA	Manx shearwater
Rum SPA	Seabird assemblage
Canna and Sanday SPA	Common guillemot
Buchan Ness to Collieston Coast SPA	Northern fulmar

European Site	Qualifying feature
Buchan Ness to Collieston Coast SPA	Black-legged kittiwake
Buchan Ness to Collieston Coast SPA	Seabird assemblage
Mingulay and Berneray SPA	Northern fulmar
Mingulay and Berneray SPA	Common guillemot
Mingulay and Berneray SPA	Razorbill
Mingulay and Berneray SPA	Seabird assemblage
Troup, Pennan and Lion's Heads SPA	Northern fulmar
Troup, Pennan and Lion's Heads SPA	Black-legged kittiwake
Troup, Pennan and Lion's Heads SPA	Seabird assemblage
Isles of Scilly SPA	European shag
Isles of Scilly SPA	Lesser black-backed gull
Isles of Scilly SPA	Great black-backed gull
Isles of Scilly SPA	Seabird assemblage
East Caithness Cliffs SPA	Northern fulmar
East Caithness Cliffs SPA	Black-legged kittiwake
East Caithness Cliffs SPA	Seabird assemblage
Shiant Isles SPA	Northern fulmar
Shiant Isles SPA	Common guillemot
Shiant Isles SPA	Razorbill
Shiant Isles SPA	Atlantic puffin
Shiant Isles SPA	Seabird assemblage
Ynys Seiriol/Puffin Island SPA	Great cormorant
Handa SPA	Northern fulmar
Handa SPA	Great skua
Handa SPA	Black-legged kittiwake
Handa SPA	Common guillemot
Handa SPA	Razorbill
Handa SPA	Seabird assemblage
North Caithness Cliffs SPA	Northern fulmar

European Site	Qualifying feature
North Caithness Cliffs SPA	Black-legged kittiwake
North Caithness Cliffs SPA	Seabird assemblage
St Kilda SPA	Northern fulmar
St Kilda SPA	Manx shearwater
St Kilda SPA	Leach's storm-petrel
St Kilda SPA	Great skua
St Kilda SPA	Common guillemot
St Kilda SPA	Atlantic puffin
St Kilda SPA	Northern gannet
St Kilda SPA	Seabird assemblage
Cape Wrath SPA	Northern fulmar
Cape Wrath SPA	Black-legged kittiwake
Cape Wrath SPA	Common guillemot
Cape Wrath SPA	Razorbill
Cape Wrath SPA	Seabird assemblage
Flannan Isles SPA	Northern fulmar
Flannan Isles SPA	Leach's storm-petrel
Flannan Isles SPA	Common guillemot
Flannan Isles SPA	Atlantic puffin
Flannan Isles SPA	Seabird assemblage
Hoy SPA	Northern fulmar
Hoy SPA	Great skua
Hoy SPA	Seabird assemblage
Copinsay SPA	Northern fulmar
Copinsay SPA	Seabird assemblage
Sule Skerry and Sule Stack SPA	Leach's storm-petrel
Sule Skerry and Sule Stack SPA	Northern gannet
Sule Skerry and Sule Stack SPA	Common guillemot
Sule Skerry and Sule Stack SPA	Atlantic puffin

European Site	Qualifying feature
Sule Skerry and Sule Stack SPA	Seabird assemblage
Rousay SPA	Northern fulmar
Rousay SPA	Seabird assemblage
North Rona and Sula Sgeir SPA	Northern fulmar
North Rona and Sula Sgeir SPA	Leach's storm-petrel
North Rona and Sula Sgeir SPA	Northern gannet
North Rona and Sula Sgeir SPA	Common guillemot
North Rona and Sula Sgeir SPA	Seabird assemblage
Calf of Eday SPA	Northern fulmar
Calf of Eday SPA	Seabird assemblage
West Westray SPA	Northern fulmar
West Westray SPA	Black-legged kittiwake
West Westray SPA	Seabird assemblage
Fair Isle SPA	Northern fulmar
Fair Isle SPA	Great skua
Fair Isle SPA	Seabird assemblage
Sumburgh Head SPA	Northern fulmar
Sumburgh Head SPA	Seabird assemblage
Foula SPA	Northern fulmar
Foula SPA	Great skua
Foula SPA	Atlantic puffin
Foula SPA	Seabird assemblage
Noss SPA	Northern fulmar
Noss SPA	Great skua
Noss SPA	Northern gannet
Noss SPA	Seabird assemblage
Ronas Hill - North Roe and Tingon SPA and Ramsar Site	Great skua
Fetlar SPA	Northern fulmar

European Site	Qualifying feature
Fetlar SPA	Great skua
Fetlar SPA	Seabird assemblage
Hermaness, Saxa Vord and Valla Field SPA	Northern fulmar
Hermaness, Saxa Vord and Valla Field SPA	Great skua
Hermaness, Saxa Vord and Valla Field SPA	Northern gannet
Hermaness, Saxa Vord and Valla Field SPA	Atlantic puffin
Hermaness, Saxa Vord and Valla Field SPA	Seabird assemblage
Ballaugh Curragh Ramsar Site	Hen harrier
Lambay Island SPA	Guillemot
Lambay Island SPA	Puffin
Lambay Island SPA	Fulmar
Lambay Island SPA	Lesser black-backed gull
Lambay Island SPA	Kittiwake
Lambay Island SPA	Razorbill
Lambay Island SPA	Herring gull
Lambay Island SPA	Shag
Lambay Island SPA	Cormorant
Howth Head Coast SPA	Kittiwake
Ireland's Eye SPA	Kittiwake
Ireland's Eye SPA	Razorbill
Ireland's Eye SPA	Cormorant
Wicklow Head SPA	Kittiwake
Saltee Islands SPA	Puffin
Saltee Islands SPA	Fulmar
Saltee Islands SPA	Gannet
Saltee Islands SPA	Kittiwake
Saltee Islands SPA	Guillemot

European Site	Qualifying feature
Saltee Islands SPA	Shag
Saltee Islands SPA	Cormorant
Saltee Islands SPA	Razorbill
Horn Head to Fanad Head SPA	Fulmar
Horn Head to Fanad Head SPA	Kittiwake
Horn Head to Fanad Head SPA	Shag
Horn Head to Fanad Head SPA	Cormorant
West Donegal Coast SPA	Fulmar
West Donegal Coast SPA	Shag
West Donegal Coast SPA	Cormorant
Tory Island SPA	Fulmar
Cliffs of Moher SPA	Fulmar
Cliffs of Moher SPA	Guillemot
Cliffs of Moher SPA	Kittiwake
Cliffs of Moher SPA	Razorbill
Stags of Broad Haven SPA	Leach's petrel
Clare Island SPA	Fulmar
Duvillaun Islands SPA	Fulmar
High Island, Inishshark and Davillaun SPA	Fulmar
Kerry Head SPA	Fulmar
Cruagh Island SPA	Manx shearwater
Dingle Peninsula SPA	Fulmar
Iveragh Peninsula SPA	Fulmar
Blasket Islands SPA	Fulmar
Blasket Islands SPA	Manx shearwater
Blasket Islands SPA	Puffin
Blasket Islands SPA	Lesser black-backed gull
Deenish Island and Scariff Island SPA	Fulmar
Deenish Island and Scariff Island SPA	Manx shearwater

European Site	Qualifying feature
Puffin Island SPA	Fulmar
Puffin Island SPA	Manx shearwater
Puffin Island SPA	Puffin
The Bull and The Cow Rocks SPA	Gannet
Skelligs SPA	Gannet
Skelligs SPA	Manx shearwater
Skelligs SPA	Fulmar
Skelligs SPA	Puffin

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11 Appendix 1 Screening of European Sites For Marine Mammal Features

Site Code	Designated Site	Country	Qualifying Species	Distance to closest point of Project (km)	Significance of effect (alone or in-combination)	Rationale
FR5300017	Abers - Côte des légendes	France	Harbour porpoise	565km	No LSE (Screened out)	The distance between the potential effect range of the Project and this designated site is beyond that of potential for direct or indirect effects, alone or in-combination.
FR5300015	Baie de Morlaix	France	Harbour porpoise	549km	No LSE (Screened out)	The distance between the potential effect range of the Project and this designated site is beyond that of potential for direct or indirect effects, alone or in-combination.
IE0002172	Blasket Islands SAC	Ireland	Harbour porpoise	490km	No LSE (Screened out)	The distance between the potential effect range of the Project and this designated site is beyond that of potential for direct or indirect effects, alone or in-combination.
IE0002172	Blasket Islands SAC	Ireland	Grey seal	490km	No LSE (Screened out)	The distance between the potential effect range of the Project and this designated site is beyond that of potential for direct or indirect effects, alone or in-combination.

Site Code	Designated Site	Country	Qualifying Species	Distance to closest point of Project (km)	Significance of effect (alone or in-combination)	Rationale
UK0030396	Bristol Channel Approaches	UK	Harbour porpoise	232km	**Potential for a LSE** (Screened in)	Potential for connectivity. It was assumed that harbour porpoise in the Project area, or areas of potential effect, could be also have connectivity to the Project.
UK0012712	Cardigan Bay SAC	UK	Bottlenose dolphin	158km	**Potential for a LSE** (Screened in)	Potential for connectivity. It was assumed that both bottlenose dolphin and grey seal in the Project area, or areas of potential effect, could be also have connectivity to the Project.
			Grey seal		**Potential for a LSE** (Screened in)	
IE0000495	Duvillaun Islands SAC	Ireland	Grey seal	424km	No LSE (Screened out)	The distance between the potential effect range of the Project and this designated site is beyond that of potential for direct or indirect effects, alone or in-combination.
FR5300009	Côte de Granit rose-Sept-Iles	France	Harbour porpoise	523km	No LSE (Screened out)	The distance between the potential effect range of the Project and this designated site is beyond that of potential for direct or indirect effects, alone or in-combination.
FR5302007	Chaussée de Sein	France	Harbour porpoise	635km	No LSE (Screened out)	The distance between the potential effect range of the Project and this designated site is beyond that of potential for

Site Code	Designated Site	Country	Qualifying Species	Distance to closest point of Project (km)	Significance of effect (alone or in-combination)	Rationale
						direct or indirect effects, alone or in-combination.
IE0000147	Horn Head and Rinclevan SAC	Ireland	Grey seal	317km	No LSE (Screened out)	The distance between the potential effect range of the Project and this designated site is beyond that of potential for direct or indirect effects, alone or in-combination.
IE0000278	Inishbofin and Inishshark SAC	Ireland	Grey seal	424km	No LSE (Screened out)	The distance between the potential effect range of the Project and this designated site is beyond that of potential for direct or indirect effects, alone or in-combination.
IE0000507	Inishkea Islands SAC	Ireland	Grey seal	427km	No LSE (Screened out)	The distance between the potential effect range of the Project and this designated site is beyond that of potential for direct or indirect effects, alone or in-combination.
IE0000204	Lambay Island SAC	Ireland	Grey seal	156km	No LSE (Screened out)	The distance between the potential effect range of the Project and this designated site is beyond that of potential for direct or indirect effects, alone or in-combination.

Site Code	Designated Site	Country	Qualifying Species	Distance to closest point of Project (km)	Significance of effect (alone or in-combination)	Rationale
FR5302015	Mers Celtiques - Talus du golfe de Gascogne	France	Harbour porpoise	543km	No LSE (Screened out)	The distance between the potential effect range of the Project and this designated site is beyond that of potential for direct or indirect effects, alone or in-combination.
UK0016612	Murlough	Ireland	Harbour seal	139km	No LSE (Screened out)	The distance between the potential effect range of the Project and this designated site is beyond that of potential for direct or indirect effects, alone or in-combination.
FR2502022	Nord Bretagne DH	France	Harbour porpoise	447km	No LSE (Screened out)	The distance between the potential effect range of the Project and this designated site is beyond that of potential for direct or indirect effects, alone or in-combination.
UK0030398	North Anglesey Marine SAC	UK	Harbour porpoise	48km	**Potential for a LSE** (Screened in)	Potential for connectivity. It was assumed that harbour porpoise in the Project area, or areas of potential effect, could be also have connectivity to the Project.
UK0030399	North Channel SAC	UK	Harbour porpoise	103km	**Potential for a LSE** (Screened in)	Potential for connectivity. It was assumed that harbour porpoise in the Project area, or areas of potential effect, could be also

Site Code	Designated Site	Country	Qualifying Species	Distance to closest point of Project (km)	Significance of effect (alone or in-combination)	Rationale
						have connectivity to the Project.
FR5300018	Ouessant-Molène	France	Harbour porpoise	588km	No LSE (Screened out)	The distance between the potential effect range of the Project and this designated site is beyond that of potential for direct or indirect effects, alone or in-combination.
UK0013116	Pembrokeshire Marine SAC	UK	Grey seal	228km	No LSE (Screened out)	The distance between the potential effect range of the Project and this designated site is beyond that of potential for direct or indirect effects, alone or in-combination.
UK0013117	Pen Llŷn a`r Sarnau SAC	UK	Bottlenose dolphin	93km	**Potential for a LSE** (Screened in)	Potential for connectivity. It was assumed that both bottlenose dolphin and grey seal in the Project area, or areas of potential effect, could be also have connectivity to the Project.
			Grey seal		**Potential for a LSE** (Screened in)	
IE0000101	Roaring water Bay and Islands SAC	Ireland	Harbour porpoise	459km	No LSE (Screened out)	The distance between the potential effect range of the Project and this designated site is beyond that of potential for direct or indirect effects, alone or in-combination.
			Grey seal		No LSE (Screened out)	

Site Code	Designated Site	Country	Qualifying Species	Distance to closest point of Project (km)	Significance of effect (alone or in-combination)	Rationale
IE0003000	Rockabill to Dalkey Island SAC	Ireland	Harbour porpoise	152km	**Potential for a LSE** (Screened in)	Potential for connectivity. It was assumed that harbour porpoise in the Project area, or areas of potential effect, could be also have connectivity to the Project.
IE0000707	Saltee Islands SAC	Ireland	Grey seal	260km	No LSE (Screened out)	The distance between the potential effect range of the Project and this designated site is beyond that of potential for direct or indirect effects, alone or in-combination.
IE0000190	Slieve Tooey/Tormore Island/Loughros Beg Bay SAC	Ireland	Grey seal	327km	No LSE (Screened out)	The distance between the potential effect range of the Project and this designated site is beyond that of potential for direct or indirect effects, alone or in-combination.
IE0000328	Slyne Head Islands SAC	Ireland	Grey seal	428km	No LSE (Screened out)	The distance between the potential effect range of the Project and this designated site is beyond that of potential for direct or indirect effects, alone or in-combination.
UK0016618	Strangford Lough	Ireland	Harbour seal	133km	**Potential for a LSE** (Screened in)	Potential for connectivity. It was assumed that harbour seal in the Project area, or areas of potential effect, could be also

Site Code	Designated Site	Country	Qualifying Species	Distance to closest point of Project (km)	Significance of effect (alone or in-combination)	Rationale
						have connectivity to the Project.
UK0030384	The Maidens SAC	Ireland	Grey seal	180km	No LSE (Screened out)	The distance between the potential effect range of the Project and this designated site is beyond that of potential for direct or indirect effects, alone or in-combination.
FR5300010	Tregor Goëlo	France	Harbour porpoise	523km	No LSE (Screened out)	The distance between the potential effect range of the Project and this designated site is beyond that of potential for direct or indirect effects, alone or in-combination.
UK0030397	West Wales Marine SAC	UK	Harbour porpoise	109km	**Potential for a LSE** (Screened in)	Potential for connectivity. It was assumed that harbour porpoise in the Project area, or areas of potential effect, could be also have connectivity to the Project.

12 Appendix 2 Screening outcome for UK SPA and Ramsar Sites with ornithology qualifying features

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
UK9020294	Liverpool Bay/Bae Lerpwl SPA	0	Red-throated diver	nb	Potential for a LSE (Screened in)	Potential risk of displacement/disturbance and displacement/barrier effects during the non-breeding season. The distance between the Project and the SPA boundary is such that there may be disturbance to red-throated divers within the SPA during construction/decommissioning of the WTGs, inter-array cables and OSP(s) and displacement/barrier effect during operation.
			Black (common) scoter	nb	Potential for a LSE (Screened in)	Potential risk of displacement/disturbance and displacement/barrier effects during the non-breeding season. The distance between the Project and the SPA boundary is such that there may be disturbance to common scoters within the SPA during construction/decommissioning of the WTGs, inter-array cables and OSP(s) and displacement/barrier effect during operation.
			Little gull	nb	Potential for a LSE (Screened in)	Potential risk of collision, displacement/disturbance and displacement/barrier effects during the

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
						non-breeding season. The distance between the Project and the SPA boundary is such that there may be disturbance to little gulls within the SPA during operation and maintenance of the WTGs, inter-array cables and OSP(s) and displacement/barrier effect during operation.
			Common tern	b	Potential for a LSE (Screened in)	Project is outside (c. 35km) breeding and likely foraging areas for common tern (Natural England, Natural Resources Wales and JNCC (2016), but potential cable routes are located within. Species have been recorded during baseline surveys during the breeding and autumn migration periods. Potential risk of collision and displacement/barrier effects during the breeding season. Non-breeding season effects have also been considered.
			Little tern	b	No LSE (Screened out)	Project is distant (c. 45km at the nearest point) from areas within the SPA boundary identified as important for foraging and nesting little terns (Natural England, Natural Resources Wales and JNCC (2016). Species not recorded in baseline surveys.

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
UK9020326	Morecambe Bay and Duddon Estuary SPA and Ramsar Site	25.9	Little egret[S]	nb	Potential for a LSE (Screened in)	Potential risk of collision with the Project during migratory flights to and from the site in numbers sufficient for LSE to be a possibility. Significant barrier effects were considered unlikely.
			Whooper swan[S]	nb	Potential for a LSE (Screened in)	
			Pink-footed goose[SR]	nb	Potential for a LSE (Screened in)	
			Common shelduck[SR]	nb	Potential for a LSE (Screened in)	
			Northern pintail[SR]	nb	Potential for a LSE (Screened in)	
			Eurasian oystercatcher[SR]	nb	Potential for a LSE (Screened in)	
			Ringed plover[SR]	nb	Potential for a LSE (Screened in)	
			European golden plover[S]	nb	Potential for a LSE (Screened in)	
			Grey plover[SR]	nb	Potential for a	

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
					LSE (Screened in)	
			Red knot[SR]	nb	Potential for a LSE (Screened in)	
			Sanderling[S]	nb	Potential for a LSE (Screened in)	
			Ruff[S]	nb	Potential for a LSE (Screened in)	
			Bar-tailed godwit[SR]	nb	Potential for a LSE (Screened in)	
			Eurasian curlew[SR]	nb	Potential for a LSE (Screened in)	
			Common redshank[SR]	nb	Potential for a LSE (Screened in)	
			Ruddy turnstone[SR]	nb	Potential for a LSE (Screened in)	
			Mediterranean gull[S]	nb	Potential for a LSE	

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
					(Screened in)	
			Lesser black-backed gull[S]	nb	Potential for a LSE (Screened in)	
			Black-tailed godwit[S]	nb	Potential for a LSE (Screened in)	
			Dunlin[SR]	nb	Potential for a LSE (Screened in)	
			Lesser black-backed gull[S]	b	Potential for a LSE (Screened in)	Project is within the published foraging range (mean max +1SD), and feature has been recorded during baseline surveys during the breeding season. Therefore, screened in for potential effects during the breeding season. Non-breeding season effects have also been considered.
			Herring gull[S]	b	Potential for a LSE (Screened in)	
			Sandwich tern[S]	b	Potential for a LSE (Screened in)	
			Common tern[S]	b	Potential for a LSE (Screened in)	
			Little tern[S]	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Species not recorded during baseline

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
						surveys during any season. Therefore, there is no evidence for connectivity between this feature and the Project at any time of year.
			Seabird assemblage[S]	b	Potential for a LSE (Screened in)	Screened in for herring gull, lesser black-backed gull, Sandwich tern and common tern, as above.
			Waterbird assemblage[SR]	nb	Potential for a LSE (Screened in)	Potential risk of collision with the Project during migratory flights to and from the site in numbers sufficient for LSE to be a possibility. Significant barrier effects were considered unlikely.
UK9005103	Ribble and Alt Estuaries SPA and Ramsar Site	27.4	Tundra (Bewick's) swan[SR]	nb	Potential for a LSE (Screened in)	Potential risk of collision with the Project during migratory flights to and from the site in numbers sufficient for LSE to be a possibility. Significant barrier effects were considered unlikely.
			Whooper swan[SR]	nb	Potential for a LSE (Screened in)	
			Pink-footed goose[SR]	nb	Potential for a LSE (Screened in)	
			Common shelduck[SR]	nb	Potential for a LSE (Screened in)	
			Eurasian	nb	Potential for a	

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
			wigeon[SR]		LSE (Screened in)	
			Eurasian teal[SR]	nb	Potential for a LSE (Screened in)	
			Northern pintail[SR]	nb	Potential for a LSE (Screened in)	
			Eurasian oystercatcher[SR]	nb	Potential for a LSE (Screened in)	
			Ringed plover[SR]	nb - passage	Potential for a LSE (Screened in)	
			European golden plover[S]	nb	Potential for a LSE (Screened in)	
			Grey plover[SR]	nb	Potential for a LSE (Screened in)	
			Red knot[SR]	nb	Potential for a LSE (Screened in)	
			Sanderling[SR]	nb - passage	Potential for a LSE	

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
					(Screened in)	
			Sanderling[SR]	nb - w	Potential for a LSE (Screened in)	
			Bar-tailed godwit[SR]	nb	Potential for a LSE (Screened in)	
			Common redshank[SR]	nb - passage	Potential for a LSE (Screened in)	
			Common redshank[SR]	nb - w	Potential for a LSE (Screened in)	
			Black-tailed godwit[SR]	nb	Potential for a LSE (Screened in)	
			Dunlin[SR]	nb	Potential for a LSE (Screened in)	
			Ruff[S]	b	Potential for a LSE (Screened in)	Potential risk of collision with the Project during migratory flights to and from the site in numbers sufficient for LSE to be a possibility. Significant barrier effects were considered unlikely.

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
			Lesser black-backed gull[SR]	b	Potential for a LSE (Screened in)	Project is within the published foraging range (mean max +1SD), and feature has been recorded during baseline surveys during the breeding season. Therefore, screened in for potential effects during the breeding season. Non-breeding season effects have also been considered.
			Common tern[S]	b	Potential for a LSE (Screened in)	
			Seabird assemblage[S]	b	Potential for a LSE (Screened in)	Screened in for lesser black-backed gull and common tern, as above.
			Waterbird assemblage[SR]	nb	Potential for a LSE (Screened in)	Potential risk of collision with the Project during migratory flights to and from the site in numbers sufficient for LSE to be a possibility. Significant barrier effects were considered unlikely.
UK9020287	Mersey Narrows and North Wirral Foreshore SPA and Ramsar Site	42.2	Bar-tailed godwit[SR]	nb	Potential for a LSE (Screened in)	Potential risk of collision with the Project during migratory flights to and from the site in numbers sufficient for LSE to be a possibility. Significant barrier effects were considered unlikely.
			Little gull[S]	nb	Potential for a LSE (Screened in)	
			Common tern[S]	nb	Potential for a LSE (Screened in)	

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
			Red knot[SR]	nb	Potential for a LSE (Screened in)	
			Common tern[S]	b	Potential for a LSE (Screened in)	Project located beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. However, this species has been recorded during baseline surveys and non-breeding season effects have been considered.
			Waterbird assemblage[SR]	nb	Potential for a LSE (Screened in)	Potential risk of collision with the Project during migratory flights to and from the site in numbers sufficient for LSE to be a possibility. Significant barrier effects were considered unlikely.
UK9005111	Martin Mere SPA and Ramsar Site	42.7	Tundra (Bewick's) swan[SR]	nb	Potential for a LSE (Screened in)	Potential risk of collision with the Project during migratory flights to and from the site in numbers sufficient for LSE to be a possibility. Significant barrier effects were considered unlikely.
			Whooper swan[S]	nb	Potential for a LSE (Screened in)	
			Pink-footed goose[SR]	nb	Potential for a LSE (Screened in)	
			Eurasian teal[S]	nb	Potential for a LSE	

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
					(Screened in)	
			Northern pintail[SR]	nb	Potential for a LSE (Screened in)	
			Eurasian wigeon[R]	nb	Potential for a LSE (Screened in)	
			Waterbird assemblage[SR]	nb	Potential for a LSE (Screened in)	Potential risk of collision with the Project during migratory flights to and from the site in numbers sufficient for LSE to be a possibility. Significant barrier effects were considered unlikely.
UK9013011	The Dee Estuary SPA and Ramsar Site	44.3	Common shelduck[SR]	nb	Potential for a LSE (Screened in)	Potential risk of collision with the Project during migratory flights to and from the site in numbers sufficient for LSE to be a possibility. Significant barrier effects were considered unlikely.
			Eurasian teal[SR]	nb	Potential for a LSE (Screened in)	
			Northern pintail[SR]	nb	Potential for a LSE (Screened in)	
			Eurasian oystercatcher[SR]	nb	Potential for a LSE (Screened in)	
			Grey plover[SR]	nb	Potential for a LSE	

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
					(Screened in)	
			Red knot[SR]	nb	Potential for a LSE (Screened in)	
			Bar-tailed godwit[SR]	nb	Potential for a LSE (Screened in)	
			Eurasian curlew[SR]	nb	Potential for a LSE (Screened in)	
			Common redshank[SR]	nb - aut	Potential for a LSE (Screened in)	
			Common redshank[SR]	nb - w	Potential for a LSE (Screened in)	
			Sandwich tern[S]	nb	Potential for a LSE (Screened in)	
			Black-tailed godwit[SR]	nb	Potential for a LSE (Screened in)	
			Dunlin[SR]	nb	Potential for a LSE (Screened in)	

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
			Common tern[S]	b	Potential for a LSE (Screened in)	Project is located beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season is likely. However, species has been recorded during baseline surveys, and therefore non-breeding season effects have been considered.
			Little tern[S]	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Species not recorded during baseline surveys during any season. Therefore, there is no evidence for connectivity between this feature and the Project at any time of year.
			Waterbird assemblage[S]	nb	Potential for a LSE (Screened in)	Potential risk of collision with the Project during migratory flights to and from the site in numbers sufficient for LSE to be a possibility. Significant barrier effects were considered unlikely.
UK9013061	Anglesey Terns/Morwenoliaid Ynys Môn SPA	49.0	Sandwich tern	b	Potential for a LSE (Screened in)	Project is within the published foraging range (mean max +1SD), therefore, screened in for potential effects during the breeding season.
			Roseate tern	b	No LSE (Screened out)	Project is located beyond the published foraging range (mean max +1SD), therefore no connectivity during the

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
			Common tern	b	Potential for a LSE (Screened in)	breeding season. Common and Arctic terns have been recorded during baseline surveys, and therefore non-breeding season effects have been considered.
			Arctic tern	b	Potential for a LSE (Screened in)	
UK9005151	Bowland Fells SPA	52.5	Hen harrier	b	Potential for a LSE (Screened in)	Potential risk of collision with the Project during migratory flights to and from the site in numbers sufficient for LSE to be a possibility. Significant barrier effects were considered unlikely.
			Merlin	b	Potential for a LSE (Screened in)	
			Lesser black-backed gull	b	Potential for a LSE (Screened in)	Project is within the published foraging range (mean max +1SD), and feature has been recorded during baseline surveys during the breeding season. Therefore, screened in for potential effects during the breeding season. Non-breeding season effects have also been considered.
UK9005131	Mersey Estuary SPA and Ramsar Site	53.4	Great crested grebe[S]	nb	Potential for a LSE (Screened in)	Potential risk of collision with the Project during migratory flights to and from the site in numbers sufficient for LSE to be a possibility. Significant barrier effects were considered unlikely.
			Common shelduck[SR]	nb	Potential for a LSE (Screened in)	
			Eurasian wigeon[S]	nb	Potential for a	

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
					LSE (Screened in)	
			Eurasian teal[SR]	nb	Potential for a LSE (Screened in)	
			Northern pintail[SR]	nb	Potential for a LSE (Screened in)	
			Ringed plover[S]	nb	Potential for a LSE (Screened in)	
			European golden plover[S]	nb	Potential for a LSE (Screened in)	
			Grey plover[S]	nb	Potential for a LSE (Screened in)	
			Northern lapwing[S]	nb	Potential for a LSE (Screened in)	
			Eurasian curlew[S]	nb	Potential for a LSE (Screened in)	
			Common redshank[SR]	nb - aut	Potential for a LSE	

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
					(Screened in)	
			Common redshank[SR]	nb - w	Potential for a LSE (Screened in)	
			Black-tailed godwit[S]	nb	Potential for a LSE (Screened in)	
			Dunlin[SR]	nb	Potential for a LSE (Screened in)	
			Waterbird assemblage[R]	nb	Potential for a LSE (Screened in)	Potential risk of collision with the Project during migratory flights to and from the site in numbers sufficient for LSE to be a possibility. Significant barrier effects were considered unlikely.
UK9020285	Puffin Island/Ynys Seiriol SPA	55	Great cormorant	b	Potential for a LSE (Screened in)	Potential risk of collision with the Project during migratory flights to and from the site in numbers sufficient for LSE to be a possibility. Significant barrier effects were considered unlikely. Screened in for non-breeding season effects as species was recorded during baseline surveys, and >1% of birds within the BDMPS region during this period will originate from this population.

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
UK11034	Leighton Moss Ramsar Site	58.7	Waterbird assemblage	nb	Potential for a LSE (Screened in)	Potential risk of collision with the Project during migratory flights to and from the site in numbers sufficient for LSE to be a possibility. Significant barrier effects were considered unlikely.
			Wetland bird assemblage	b	Potential for a LSE (Screened in)	
UK9013031	Traeth Lafan/Lavan Sands, Conway Bay SPA	59.3	Great crested grebe	nb	Potential for a LSE (Screened in)	Potential risk of collision with the Project during migratory flights to and from the site in numbers sufficient for LSE to be a possibility. Significant barrier effects were considered unlikely.
			Red-breasted merganser	nb	Potential for a LSE (Screened in)	
			Eurasian oystercatcher	nb	Potential for a LSE (Screened in)	
			Eurasian curlew	nb	Potential for a LSE (Screened in)	
			Common redshank	nb	Potential for a LSE (Screened in)	

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
K9005012	Solway Firth SPA	76	Red-throated diver	nb	Potential for a LSE (Screened in)	Potential risk of collision with the Project during migratory flights to and from the site in numbers sufficient for LSE to be a possibility. Significant barrier effects were considered unlikely.
			Great cormorant	nb	Potential for a LSE (Screened in)	
			Whooper swan	nb	Potential for a LSE (Screened in)	
			Pink-footed goose	nb	Potential for a LSE (Screened in)	
			Barnacle goose	nb	Potential for a LSE (Screened in)	
			Common shelduck	nb	Potential for a LSE (Screened in)	
			Eurasian teal	nb	Potential for a LSE (Screened in)	
			Northern pintail	nb	Potential for a LSE (Screened in)	
			Northern shoveler	nb	Potential for a	

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
					LSE (Screened in)	
			Greater scaup	nb	Potential for a LSE (Screened in)	
			Black (common) scoter	nb	Potential for a LSE (Screened in)	
			Common goldeneye	nb	Potential for a LSE (Screened in)	
			Goosander	nb	Potential for a LSE (Screened in)	
			Eurasian oystercatcher	nb	Potential for a LSE (Screened in)	
			Ringed plover	nb	Potential for a LSE (Screened in)	
			European golden plover	nb	Potential for a LSE (Screened in)	
			Grey plover	nb	Potential for a LSE	

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
					(Screened in)	
			Northern lapwing	nb	Potential for a LSE (Screened in)	
			Red knot	nb	Potential for a LSE (Screened in)	
			Sanderling	nb	Potential for a LSE (Screened in)	
			Bar-tailed godwit	nb	Potential for a LSE (Screened in)	
			Eurasian curlew	nb	Potential for a LSE (Screened in)	
			Common redshank	nb	Potential for a LSE (Screened in)	
			Ruddy turnstone	nb	Potential for a LSE (Screened in)	
			Black-headed gull	nb	Potential for a LSE (Screened in)	

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
			Mew (common) gull	nb	Potential for a LSE (Screened in)	
			Herring gull	nb	Potential for a LSE (Screened in)	
			Dunlin	nb	Potential for a LSE (Screened in)	
UK9013131	Migneint-Arenig-Dduallt SPA	79.4	Hen harrier	b	Potential for a LSE (Screened in)	Potential risk of collision with the Project during migratory flights to and from the site in numbers sufficient for LSE to be a possibility. Significant barrier effects were considered unlikely.
			Merlin	b	Potential for a LSE (Screened in)	
			Peregrine falcon	b	Potential for a LSE (Screened in)	
UK9020328	Irish Sea Front SPA	87.1	Manx shearwater	b	No LSE (Screened out)	SPA site boundary encompasses core areas used during the breeding season. No evidence for connectivity between this feature and the Project; effects on breeding Manx shearwaters have been addressed through assessment for breeding-site SPAs.

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
UK9013111	Berwyn SPA	87.1	Red kite	b	Potential for a LSE (Screened in)	Potential risk of collision with the Project during migratory flights to and from the site in numbers sufficient for LSE to be a possibility. Significant barrier effects were considered unlikely.
			Hen harrier	b	Potential for a LSE (Screened in)	
			Merlin	b	Potential for a LSE (Screened in)	
			Peregrine falcon	b	Potential for a LSE (Screened in)	
UK9007022	South Pennine Moors Phase 2 SPA	87.4	Merlin	b	Potential for a LSE (Screened in)	Potential risk of collision with the Project during migratory flights to and from the site in numbers sufficient for LSE to be a possibility. Significant barrier effects were considered unlikely.
			European golden plover	b	Potential for a LSE (Screened in)	
			Short-eared owl	b	Potential for a LSE (Screened in)	

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
UK9006272	North Pennine Moors SPA	98.1	Hen harrier	b	Potential for a LSE (Screened in)	Potential risk of collision with the Project during migratory flights to and from the site in numbers sufficient for LSE to be a possibility. Significant barrier effects were considered unlikely.
			Merlin	b	Potential for a LSE (Screened in)	
			Peregrine falcon	b	Potential for a LSE (Screened in)	
			European golden plover	b	Potential for a LSE (Screened in)	
UK9020327	Northern Cardigan Bay/Gogledd Bae Ceredigion SPA	101	Red-throated diver	nb	No LSE (Screened out)	Designated site boundary encompasses core areas used during the non-breeding season. Extensive distance between the SPA boundary and the Project. No evidence for connectivity between this feature and the Project.
UK9013121	Glannau Aberdaron ac Ynys Enlli/Aberdaron Coast and Bardsey Island SPA	125	Manx shearwater	b	Potential for a LSE (Screened in)	Project is within the published foraging range (mean max +1SD), and feature has been recorded during baseline surveys during the breeding season. Therefore, screened in for potential effects during the breeding season. Non-breeding season effects have also been considered.
			Red-billed chough	b, nb	No LSE	No connectivity between the Project and

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
					(Screened out)	this feature is likely.
UK9020271	Outer Ards SPA and Ramsar Site	133	Arctic tern	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.
UK9020111	Strangford Lough SPA and Ramsar Site	132	Sandwich tern	b	Potential for a LSE (Screened in)	Project beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened in for non-breeding season effects as species was recorded during baseline surveys, and >1% of birds within the BDMPS region during this period will originate from this population.
			Common tern	b	Potential for a LSE (Screened in)	
			Arctic tern	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
UK9020291	Copeland Islands SPA	149	Manx shearwater	b	Potential for a LSE (Screened in)	Project is within the published foraging range (mean max +1SD), and feature has been recorded during baseline surveys during the breeding season. Therefore, screened in for potential effects during the breeding season. Non-breeding season effects have also been considered.
			Arctic tern	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.
UK9020161	Carlingford Lough SPA and Ramsar Site	159	Sandwich tern	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.
			Common tern	b	No LSE (Screened out)	

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
UK9020101	Belfast Lough SPA and Ramsar Site	167	Common tern	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Although these species have been recorded during baseline surveys, distance from site indicates that presence of significant numbers of birds originating from the site, within the Project area, is unlikely. BDMPS data for this site not available.
			Arctic tern	b	No LSE (Screened out)	
UK9006061	Teesmouth and Cleveland Coast SPA and Ramsar Site	170	Sandwich tern	nb	No LSE (Screened out)	SPA site boundary encompasses core areas used by passage birds outside the breeding season. Extensive distance between the site boundary and the Project. No evidence for connectivity between this feature and the Project.
			Common tern	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Although this species has been recorded during baseline surveys, distance from site indicates that presence of significant numbers of birds originating from the site within the Project area is unlikely. BDMPS data for this site not available.
			Little tern	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season.

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
						Species not recorded during baseline surveys during any season. Therefore, there is no evidence for connectivity between this feature and the Project at any time of year.
UK9020042	Larne Lough SPA and Ramsar Site	166	Mediterranean gull	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Species not recorded during baseline surveys during any season. Therefore, there is no evidence for connectivity between this feature and the Project at any time of year.
			Sandwich tern	b	Potential for a LSE (Screened in)	Project beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened in for non-breeding season effects as species was recorded during baseline surveys, and >1% of birds within the BDMPS region during this period will originate from this population.
			Common tern	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season effects; species was not recorded during baseline surveys, and <1% of birds within the BDMPS region during this period will

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
						originate from this population.
			Roseate tern	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season effects; species was not recorded during baseline surveys, and <1% of birds within the BDMPS region during this period will originate from this population.
UK9003091	Ailsa Craig SPA	177	Northern gannet	b	Potential for a LSE (Screened in)	Project is within the published foraging range (mean max +1SD), and feature has been recorded during baseline surveys during the breeding season. Therefore, screened in for potential effects during the breeding season. Non-breeding season effects have also been considered.
			Lesser black-backed gull	b	Potential for a LSE (Screened in)	
			Black-legged kittiwake*	b	Potential for a LSE (Screened in)	
			Herring gull*	b	Potential for a LSE (Screened in)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
			Common guillemot*	b	Potential for a LSE (Screened in)	Project beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened in for non-breeding season effects as species was recorded during baseline surveys, and >1% of birds within the BDMPS region during this period will originate from this population.
			Seabird assemblage	b	Potential for a LSE (Screened in)	Assemblage species indicated with (*) above.
UK9006131	Northumbria Coast SPA	177	Arctic tern	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Although this species has been recorded during baseline surveys, distance from site indicates that presence of significant numbers of birds originating from the site within the Project area is unlikely. BDMPS data for this site not available.
			Little tern	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season effects; species was not recorded during baseline surveys, and <1% of birds within the BDMPS region during this period will originate from this population.

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
UK9020091	Lough Neagh and Lough Beg SPA	190	Common tern	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.
UK9020325	Northumberland Marine SPA	191	Roseate tern	b	No LSE (Screened out)	SPA site boundary encompasses core areas used during the breeding season. No evidence for connectivity between this feature and the Project.
			Sandwich tern	b	No LSE (Screened out)	
			Common tern	b	No LSE (Screened out)	
			Arctic tern	b	No LSE (Screened out)	
			Little tern	b	No LSE (Screened out)	
			Common guillemot	b	No LSE (Screened out)	

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
			Atlantic puffin	b	No LSE (Screened out)	
			Seabird assemblage	b	No LSE (Screened out)	
UK9006031	Coquet Island SPA	210	Common tern	b	Potential for a LSE (Screened in)	Project beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened in for non-breeding season effects as species was recorded during baseline surveys, and >1% of birds within the BDMPS region during this period will originate from this population.
			Sandwich tern	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season effects; although species (except roseate tern) were recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.
			Arctic tern	b	No LSE (Screened out)	
			Roseate tern	b	No LSE (Screened out)	
			Seabird assemblage	b	Potential for a LSE (Screened in)	Screened in for common tern, as above.

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
UK9006101	Flamborough and Filey Coast SPA	212	Northern gannet	b	Potential for a LSE (Screened in)	Although Project is within 'straight line' published foraging range (mean max +1SD), distance across sea is very large (>1000km); therefore no breeding season connectivity. Screened in for non-breeding season effects as species was recorded during baseline surveys, and >1% of birds within the BDMPS region during this period will originate from this population.
			Black-legged kittiwake	b	Potential for a LSE (Screened in)	
			Common guillemot	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.
			Razorbill	b	No LSE (Screened out)	
			Seabird assemblage	b	Potential for a LSE (Screened in)	Screened in for species above.

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
UK9020011	Rathlin Island SPA	223	Black-legged kittiwake	b	Potential for a LSE (Screened in)	Project is within the published foraging range (mean max +1SD), and feature has been recorded during baseline surveys during the breeding season. Therefore, screened in for potential effects during the breeding season. Non-breeding season effects have also been considered.
			Common guillemot	b	Potential for a LSE (Screened in)	Project beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened in for non-breeding season effects as species was recorded during baseline surveys, and >1% of birds within the BDMPS region during this period will originate from this population.
			Razorbill	b	Potential for a LSE (Screened in)	
			Seabird assemblage	b	Potential for a LSE (Screened in)	Screened in for assemblage species above, together with fulmar, lesser black-backed gull and puffin, which are within published foraging range (mean max +1SD).
UK9006011	Lindisfarne SPA	227	Roseate tern	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Species not recorded during baseline surveys during any season. Therefore, there is no evidence for connectivity between this feature and the Project at any time of year.
			Little tern	b	No LSE (Screened out)	

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
UK9014091	Bae Caerfyrddin/Carmarthen Bay SPA	231	Black (common) scoter	nb	No LSE (Screened out)	SPA site boundary encompasses core areas used during the non-breeding season. Extensive distance between the site boundary and the Project. No evidence for connectivity between this feature and the Project.
UK9020021	Sheep Island SPA	231	Great cormorant	b	Potential for a LSE (Screened in)	Project beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened in for non-breeding season effects as species was recorded during baseline surveys, and >1% of birds within the BDMPS region during this period will originate from this population.
UK9006021	Farne Islands SPA	232	Sandwich tern	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.
			Arctic tern	b	No LSE (Screened out)	
			Common tern	b	No LSE (Screened out)	
			Roseate tern	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
						effects; species was not recorded during baseline surveys, and <1% of birds within the BDMPS region during this period will originate from this population.
			Common guillemot	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.
			Seabird assemblage	b	Potential for a LSE (Screened in)	Screened in for puffin. Although Project is within 'straight line' published foraging range (mean max +1SD), distance across sea is very large (>1000km); therefore no breeding season connectivity. Screened in for non-breeding season effects as species was recorded during baseline surveys, and >1% of birds within the BDMPS region during this period will originate from this population.
UK9020316	Outer Firth of Forth and St Andrews Bay Complex SPA	237	Manx shearwater*	b	No LSE (Screened out)	Site boundary encompasses core areas used during the breeding and non-breeding seasons. Extensive distance between the site boundary and the Project. No evidence for connectivity between this feature and
			Northern gannet	b	No LSE (Screened	

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
					out)	the Project. Effects on breeding species have been addressed through assessment for breeding-site SPAs.
			Black-legged kittiwake*	b	No LSE (Screened out)	
			Atlantic puffin*	b	No LSE (Screened out)	
			European shag	b	No LSE (Screened out)	
			Herring gull*	b	No LSE (Screened out)	
			Common tern	b	No LSE (Screened out)	
			Arctic tern	b	No LSE (Screened out)	
			Common guillemot*	b	No LSE (Screened out)	
			Little gull	nb	No LSE (Screened out)	

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
			Seabird assemblage	b	No LSE (Screened out)	
			Seabird assemblage	nb	No LSE (Screened out)	
UK9004171	Forth Islands SPA	239	Northern gannet	b	Potential for a LSE (Screened in)	Although Project is within 'straight line' published foraging range (mean max +1SD), distance across sea is very large (>1000km); therefore no breeding season connectivity. Screened in for non-breeding season effects as species was recorded during baseline surveys, and >1% of birds within the BDMPS region during this period will originate from this population.
			Atlantic puffin	b	Potential for a LSE (Screened in)	
			Black-legged kittiwake*	b	No LSE (Screened out)	Although Project is within 'straight line' published foraging range (mean max +1SD), distance across sea is very large (>1000km); therefore no breeding season connectivity. Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.
			Great cormorant*	b	No LSE (Screened	Project is beyond the published foraging range (mean max +1SD), therefore no

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
					out)	connectivity during the breeding season. Screened out for non-breeding season effects; although species was recorded during baseline surveys (excluding roseate tern), <1% of birds within the BDMPS region during this period will originate from this population.
			European shag	b	No LSE (Screened out)	
			Lesser black-backed gull	b	No LSE (Screened out)	
			Herring gull*	b	No LSE (Screened out)	
			Sandwich tern	b	No LSE (Screened out)	
			Roseate tern	b	No LSE (Screened out)	
			Common tern	b	No LSE (Screened out)	
			Arctic tern	b	No LSE (Screened out)	
			Common guillemot*	b	No LSE (Screened out)	

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
			Razorbill*	b	No LSE (Screened out)	
			Seabird assemblage	b	Potential for a LSE (Screened in)	Screened in for gannet and puffin, as above. [Assemblage-only species indicated by (*)].
UK9004271	St Abb's Head to Fast Castle SPA	298	Black-legged kittiwake*	b	No LSE (Screened out)	Although Project is within 'straight line' published foraging range (mean max +1SD), distance across sea is very large (>1000km); therefore no breeding season connectivity. Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.
			European shag*	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.
			Herring gull*	b	No LSE (Screened out)	
			Common guillemot*	b	No LSE (Screened out)	
			Razorbill*	b	No LSE	

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
					(Screened out)	
			Seabird assemblage	b	No LSE (Screened out)	Screened out for all species, as above. [Assemblage-only species indicated by (*)].
UK9014051	Skomer, Skokholm and the Seas off Pembrokeshire/Sgomer, Sgogwm a Moroedd Penfro SPA	246	Manx shearwater	b	Potential for a LSE (Screened in)	Project is within the published foraging range (mean max +1SD), and feature has been recorded during baseline surveys during the breeding season. Therefore, screened in for potential effects during the breeding season. Non-breeding season effects have also been considered.
			European storm-petrel	b	Potential for a LSE (Screened in)	Project is within the published foraging range (mean max +1SD). Feature has not been recorded during baseline surveys; however, presence is possible. Therefore, screened in for potential effects during the breeding season. Non-breeding season effects have also been considered.
			Short-eared owl	b	No LSE (Screened out)	No connectivity between the Project and this feature
			Atlantic puffin	b	Potential for a LSE (Screened in)	Project beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened in for non-breeding season effects as species was recorded during
			Lesser black-	b	Potential for a LSE	

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
			backed gull		(Screened in)	baseline surveys, and >1% of birds within the BDMPS region during this period will originate from this population.
			Seabird assemblage	b	Potential for a LSE (Screened in)	Screened in for species above, and also for kittiwake, guillemot and razorbill.
UK9014041	Grassholm SPA	256	Northern gannet	b	Potential for a LSE (Screened in)	Project is within the published foraging range (mean max +1SD), and feature has been recorded during baseline surveys during the breeding season. Therefore, screened in for potential effects during the breeding season. Non-breeding season effects have also been considered.
UK9003171	North Colonsay and Western Cliffs SPA	293	Black-legged kittiwake*	b	Potential for a LSE (Screened in)	Project is within the published foraging range (mean max +1SD), and feature has been recorded during baseline surveys during the breeding season. Therefore, screened in for potential effects during the breeding season. Non-breeding season effects have also been considered.
			Common guillemot*	b	Potential for a LSE (Screened in)	Project beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened in for non-breeding season effects as species was recorded during baseline surveys, and >1% of birds within the BDMPS region during this period will

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
						originate from this population.
			Seabird assemblage	b	Potential for a LSE (Screened in)	Assemblage species as above, indicated by (*)
UK9003211	Glas Eileanan SPA	325	Common tern	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.
UK9003041	Treshnish Isles SPA	339	European storm-petrel	b	Potential for a LSE (Screened in)	Project is just outside published foraging range (mean max +1SD) (336km). Feature has not been recorded during baseline surveys; however, presence is possible. Therefore, screened in on a precautionary basis for potential effects during the breeding season. Non-breeding season effects have also been considered.
UK9002271	Fowlsheugh SPA	351	Northern fulmar*	b	Potential for a LSE (Screened in)	Project is within the published foraging range (mean max +1SD) (including across-sea distance), and feature has been recorded during baseline surveys during the breeding season. Therefore, screened in for potential effects during the breeding season. Non-breeding season effects have

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
						also been considered.
			Black-legged kittiwake	b	Potential for a LSE (Screened in)	Project beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened in for non-breeding season effects as species was recorded during baseline surveys, and >1% of birds within the BDMPS region during this period will originate from this population.
			Herring gull*	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.
			Common guillemot	b	No LSE (Screened out)	
			Razorbill*	b	No LSE (Screened out)	
			Seabird assemblage	b	Potential for a LSE (Screened in)	Screened in for fulmar and kittiwake, as above. Assemblage-only species indicated by (*).
UK9020298	West Inverness-shire Lochs SPA	366	Black-throated diver	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Species not recorded during baseline surveys during any season. Therefore, there is no evidence for connectivity

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
						between this feature and the Project at any time of year. BDMPS data for this site not available.
			Black (common) scoter	b	No LSE (Screened out)	There is no published foraging range (mean max +1SD) for this species, but it is reasonable to assume that birds remain close to the nesting site, therefore no connectivity during the breeding season. Although species has been recorded during baseline surveys, distance from site indicates that presence of significant numbers of birds originating from the small site breeding population within the Project area is unlikely. BDMPS data for this site not available.
UK9001341	Rum SPA	374	Manx shearwater	b	Potential for a LSE (Screened in)	Project is within the published foraging range (mean max +1SD), and feature has been recorded during baseline surveys during the breeding season. Therefore, screened in for potential effects during the breeding season. Non-breeding season effects have also been considered.
			Red-throated diver	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season effects; although species was recorded
			Black-legged kittiwake*	b	No LSE (Screened	

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
					out)	during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.
			Common guillemot*	b	No LSE (Screened out)	
			Seabird assemblage	b	Potential for a LSE (Screened in)	Screened in for Manx shearwater, as above. Assemblage-only species indicated by (*).
UK9002221	Ythan Estuary, Sands of Forvie and Meikle Loch SPA, and Ythan Estuary and Meikle Loch Ramsar	380	Sandwich tern	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.
			Common tern	b	No LSE (Screened out)	
			Little tern	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Species not recorded during baseline surveys during any season. Therefore, there is no evidence for connectivity between this feature and the Project at any time of year.

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
UK9001431	Canna and Sanday SPA	394	Common guillemot*	b	Potential for a LSE (Screened in)	Project beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened in for non-breeding season effects as species was recorded during baseline surveys, and >1% of birds within the BDMPS region during this period will originate from this population.
			European shag*	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.
			Herring gull*	b	No LSE (Screened out)	
			Black-legged kittiwake*	b	No LSE (Screened out)	
			Atlantic puffin*	b	No LSE (Screened out)	
			Seabird assemblage	b	Potential for a LSE (Screened in)	Screened in for guillemot, as above. Assemblage-only species indicated by (*).

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
UK9002811	Tips of Corsemaul and Tom Mor SPA	402	Mew gull (common gull)	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Although species has been recorded during baseline surveys, distance from site indicates that presence of significant numbers of birds originating from the site within the Project area is unlikely. BDMPS data for this site not available.
UK9002491	Buchan Ness to Collieston Coast SPA	401	Northern fulmar*	b	Potential for a LSE (Screened in)	Project is within the published foraging range (mean max +1SD) (including across-sea distance), and feature has been recorded during baseline surveys during the breeding season. Therefore, screened in for potential effects during the breeding season. Non-breeding season effects have also been considered.
			Black-legged kittiwake*	b	Potential for a LSE (Screened in)	Project beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened in for non-breeding season effects as species was recorded during baseline surveys, and >1% of birds within the BDMPS region during this period will originate from this population.
			European shag*	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season.

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
			Herring gull*	b	No LSE (Screened out)	Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.
			Common guillemot*	b	No LSE (Screened out)	
			Seabird assemblage	b	Potential for a LSE (Screened in)	Screened in for fulmar and kittiwake, as above. Assemblage-only species indicated by (*).
UK9001121	Mingulay and Berneray SPA	406	Northern fulmar*	b	Potential for a LSE (Screened in)	Project is within the published foraging range (mean max +1SD), and feature has been recorded during baseline surveys during the breeding season. Therefore, screened in for potential effects during the breeding season. Non-breeding season effects have also been considered.
			Common guillemot*	b	Potential for a LSE (Screened in)	Project beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened in for non-breeding season effects as species was recorded during baseline surveys, and >1% of birds within the BDMPS region during this period will originate from this population.
			Razorbill	b	Potential for a LSE (Screened in)	
			Black-legged kittiwake*	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season.

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
			Atlantic puffin*	b	No LSE (Screened out)	Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.
			European shag*	b	No LSE (Screened out)	
			Seabird assemblage	b	Potential for a LSE (Screened in)	Screened in for fulmar, guillemot and razorbill, as above. Assemblage-only species indicated by (*).
UK9002471	Troup, Pennan and Lion's Heads SPA	433	Northern fulmar*	b	Potential for a LSE (Screened in)	Project is within the published foraging range (mean max +1SD) (including across-sea distance), and feature has been recorded during baseline surveys during the breeding season. Therefore, screened in for potential effects during the breeding season. Non-breeding season effects have also been considered.
			Black-legged kittiwake*	b	Potential for a LSE (Screened in)	Project beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened in for non-breeding season effects as species was recorded during baseline surveys, and >1% of birds within the BDMPS region during this period will originate from this population.
			Herring gull*	b	No LSE (Screened	Project is beyond the published foraging range (mean max +1SD), therefore no

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
					out)	connectivity during the breeding season. Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.
			Common guillemot	b	No LSE (Screened out)	
			Razorbill*	b	No LSE (Screened out)	
			Seabird assemblage	b	Potential for a LSE (Screened in)	Screened in for fulmar and kittiwake, as above. Assemblage-only species indicated by (*).
UK9020288	Isles of Scilly SPA	459	European storm-petrel	b	No LSE (Screened out)	Project beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Not recorded during baseline surveys, presence of significant numbers of birds originating from the site during non-breeding season is therefore unlikely. BDMPS data for this site not available.
			European shag	b	Potential for a LSE (Screened in)	Project beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened in for non-breeding season effects as species was recorded during baseline surveys, and >1% of birds within the BDMPS region during this period will originate from this population.
			Lesser black-backed gull	b	Potential for a LSE (Screened in)	
			Great black-backed gull	b	Potential for a LSE	

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
					(Screened in)	
			Seabird assemblage	b	Potential for a LSE (Screened in)	Screened in for shag, lesser black-backed gull and greater black-backed gull, as above.
UK9001261	Priest Island (Summer Isles) SPA	474	European storm-petrel	b	No LSE (Screened out)	Project beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Not recorded during baseline surveys, presence of significant numbers of birds originating from the site during non-breeding season is therefore unlikely. BDMPS data for this site not available.
UK9001182	East Caithness Cliffs SPA	474	Northern fulmar*	b	Potential for a LSE (Screened in)	Project is within the published foraging range (mean max +1SD) (including across-sea distance), and feature has been recorded during baseline surveys during the breeding season. Therefore, screened in for potential effects during the breeding season. Non-breeding season effects have also been considered.
			Black-legged kittiwake	b	Potential for a LSE (Screened in)	Project beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened in for non-breeding season effects as species was recorded during baseline surveys, and >1% of birds within the BDMPS region during this period will

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
						originate from this population.
			Great cormorant*	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.
			European shag	b	No LSE (Screened out)	
			Herring gull	b	No LSE (Screened out)	
			Great black-backed gull*	b	No LSE (Screened out)	
			Common guillemot	b	No LSE (Screened out)	
			Razorbill	b	No LSE (Screened out)	
			Peregrine falcon	b	No LSE (Screened out)	No connectivity between the Project and this feature is likely.
			Seabird assemblage	b	Potential for a LSE (Screened in)	Screened in for fulmar and kittiwake, as above. Assemblage-only species indicated by (*).

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
UK9001041	Shiant Isles SPA	474	Northern fulmar*	b	Potential for a LSE (Screened in)	Project is within the published foraging range (mean max +1SD), and feature has been recorded during baseline surveys during the breeding season. Therefore, screened in for potential effects during the breeding season. Non-breeding season effects have also been considered.
			European shag	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Distance from site indicates that presence of significant numbers of birds originating from the site within the Project area is unlikely.
			Black-legged kittiwake*	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.
			Common guillemot*	b	Potential for a LSE (Screened in)	Project beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened in for non-breeding season effects as species was recorded during
			Razorbill	b	Potential for a LSE	

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
					(Screened in)	baseline surveys, and >1% of birds within the BDMPS region during this period will originate from this population.
			Atlantic puffin	b	Potential for a LSE (Screened in)	
			Barnacle goose	nb	No LSE (Screened out)	Birds migrating to and from the SPA to their breeding grounds (Greenland) are unlikely to occur at the windfarm site, therefore no connectivity between the Project and this feature is likely.
			Seabird assemblage	b	Potential for a LSE (Screened in)	Screened in for fulmar, guillemot, razorbill and puffin, as above. Assemblage-only species indicated by (*).
UK9001071	Monach Islands SPA	480	Little tern	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Species not recorded during baseline surveys during any season. Therefore, there was no evidence for connectivity between this feature and the Project at any time of year.

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
UK9001241	Handa SPA	509	Northern fulmar*	b	Potential for a LSE (Screened in)	Project is within the published foraging range (mean max +1SD), and feature has been recorded during baseline surveys during the breeding season. Therefore, screened in for potential effects during the breeding season. Non-breeding season effects have also been considered.
			Great skua*	b	Potential for a LSE (Screened in)	
			Arctic skua*	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.
			Black-legged kittiwake*	b	Potential for a LSE (Screened in)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.
			Common guillemot	b	Potential for a LSE (Screened in)	Project beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season.

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
			Razorbill	b	Potential for a LSE (Screened in)	Screened in for non-breeding season effects as species was recorded during baseline surveys, and >1% of birds within the BDMPS region during this period will originate from this population.
			Seabird assemblage	b	Potential for a LSE (Screened in)	Screened in for fulmar, great skua, guillemot and razorbill, as above. Assemblage-only species indicated by (*).
UK9020332	Seas off St Kilda SPA	531	Northern fulmar*	b	No LSE (Screened out)	Site boundary encompasses core areas used during the breeding season. No evidence for connectivity between this feature and the Project.
			European storm-petrel*	b	No LSE (Screened out)	
			Northern gannet	b	No LSE (Screened out)	
			Common guillemot*	b	No LSE (Screened out)	
			Atlantic puffin*	b	No LSE (Screened out)	
			Seabird assemblage	b	No LSE (Screened out)	

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
UK9001181	North Caithness Cliffs SPA	524	Northern fulmar*	b	Potential for a LSE (Screened in)	Project is within the published foraging range (mean max +1SD) (including across-sea distance), and feature has been recorded during baseline surveys during the breeding season. Therefore, screened in for potential effects during the breeding season. Non-breeding season effects have also been considered.
			Black-legged kittiwake*	b	Potential for a LSE (Screened in)	Project beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened in for non-breeding season effects as species was recorded during baseline surveys, and >1% of birds within the BDMPS region during this period will originate from this population.
			Common guillemot	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.
			Razorbill*	b	No LSE (Screened out)	
			Atlantic puffin*	b	No LSE (Screened out)	
			Seabird assemblage	b	Potential for a LSE	Screened in for fulmar and kittiwake as above. Assemblage-only species indicated

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
					(Screened in)	by (*).
UK9001031	St Kilda SPA	526	Northern fulmar*	b	Potential for a LSE (Screened in)	Project is within the published foraging range (mean max +1SD), and feature has been recorded during baseline surveys during the breeding season (or presence is considered possible in case of Leach's storm-petrel). Therefore, screened in for potential effects during the breeding season. Non-breeding season effects have also been considered.
			Manx shearwater*	b	Potential for a LSE (Screened in)	
			Leach's storm-petrel	b	Potential for a LSE (Screened in)	
			Great skua	b	Potential for a LSE (Screened in)	
			Common guillemot*	b	Potential for a LSE (Screened in)	Project beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened in for non-breeding season effects as species was recorded during baseline surveys, and >1% of birds within the BDMPS region during this period will originate from this population.
			Atlantic puffin	b	Potential for a LSE (Screened in)	
			Northern gannet	b	Potential for a LSE (Screened in)	
			European storm-petrel	b	No LSE (Screened out)	Project beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Not recorded during baseline surveys,

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
						presence of significant numbers of birds originating from the site during non-breeding season is therefore unlikely. BDMPS data for this site not available.
			Black-legged kittiwake*	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.
			Razorbill*	b	No LSE (Screened out)	
			Seabird assemblage	b	Potential for a LSE (Screened in)	
UK9001231	Cape Wrath SPA	530	Northern fulmar*	b	Potential for a LSE (Screened in)	Project is within the published foraging range (mean max +1SD), and feature has been recorded during baseline surveys during the breeding season. Therefore, screened in for potential effects during the breeding season. Non-breeding season effects have also been considered.
			Black-legged kittiwake*	b	Potential for a LSE (Screened in)	Project beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened in for non-breeding season effects as species was recorded during baseline surveys, and >1% of birds within
			Common guillemot*	b	Potential for a LSE (Screened in)	

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
			Razorbill*	b	Potential for a LSE (Screened in)	the BDMPS region during this period will originate from this population.
			Atlantic puffin*	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.
			Seabird assemblage	b	Potential for a LSE (Screened in)	Screened in for fulmar, kittiwake, guillemot and razorbill, as above. Assemblage-only species indicated by (*).
UK9001131	Pentland Firth Islands SPA	541	Arctic tern	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
UK9001021	Flannan Isles SPA	544	Northern fulmar*	b	Potential for a LSE (Screened in)	Project is within the published foraging range (mean max +1SD), and feature has been recorded during baseline surveys during the breeding season (or presence considered possible in case of Leach's storm-petrel). Therefore, screened in for potential effects during the breeding season. Non-breeding season effects have also been considered.
			Leach's storm-petrel	b	Potential for a LSE (Screened in)	
			Common guillemot*	b	Potential for a LSE (Screened in)	Project beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened in for non-breeding season effects as species was recorded during baseline surveys, and >1% of birds within the BDMPS region during this period will originate from this population.
			Atlantic puffin*	b	Potential for a LSE (Screened in)	
			Black-legged kittiwake*	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.
			Razorbill*	b	No LSE (Screened out)	
			Seabird assemblage	b	Potential for a LSE (Screened in)	Screened in for fulmar, Leach's storm petrel, guillemot and puffin, as above. Assemblage-only species indicated by (*).

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
UK9002141	Hoy SPA	546	Red-throated diver	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.
			Northern fulmar*	b	Potential for a LSE (Screened in)	Project is within the published foraging range (mean max +1SD) (including across-sea distance), and feature has been recorded during baseline surveys during the breeding season. Therefore, screened in for potential effects during the breeding season. Non-breeding season effects have also been considered.
			Great skua	b	Potential for a LSE (Screened in)	
			Peregrine falcon	b	No LSE (Screened out)	Peregrine is a largely sedentary (non-migratory) species and therefore unlikely to occur at the windfarm site. No connectivity between the Project and this feature is likely.
			Arctic skua*	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
						will originate from this population.
			Great black-backed gull*	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.
			Black-legged kittiwake*	b	No LSE (Screened out)	
			Common guillemot*	b	No LSE (Screened out)	
			Atlantic puffin*	b	No LSE (Screened out)	
			Seabird assemblage	b	Potential for a LSE (Screened in)	Screened in for red-throated diver, fulmar and great skua, as above. Assemblage-only species indicated by (*).
UK9002151	Copinsay SPA	562	Northern fulmar*	b	Potential for a LSE (Screened in)	Project is within the published foraging range (mean max +1SD) (including across-sea distance), and feature has been recorded during baseline surveys during the breeding season. Therefore, screened in for potential effects during the breeding season. Non-breeding season effects have also been considered.
			Great black-backed gull*	b	No LSE (Screened	Project is beyond the published foraging range (mean max +1SD), therefore no

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
					out)	connectivity during the breeding season. Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.
			Black-legged kittiwake*	b	No LSE (Screened out)	
			Common guillemot*	b	No LSE (Screened out)	
			Seabird assemblage	b	Potential for a LSE (Screened in)	Screened in for fulmar, as above. Assemblage-only species indicated by (*).
UK9002181	Sule Skerry and Sule Stack SPA	575	Leach's storm-petrel	b	Potential for a LSE (Screened in)	Project is within the published foraging range (mean max +1SD) (including across-sea distance), and although feature has not been recorded during baseline surveys during the breeding season, presence is considered possible. Therefore, screened in for potential effects during the breeding season. Non-breeding season effects have also been considered.
			Northern gannet	b	Potential for a LSE (Screened in)	Project beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened in for non-breeding season effects as species was recorded during baseline surveys, and >1% of birds within the BDMPS region during this period will originate from this population.
			Common guillemot*	b	Potential for a LSE (Screened in)	
			Atlantic puffin	b	Potential for a	

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
					LSE (Screened in)	
			European storm-petrel	b	No LSE (Screened out)	Project beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Not recorded during baseline surveys, presence of significant numbers of birds originating from the site during non-breeding season is therefore unlikely. BDMPS data for this site not available.
			European shag*	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.
			Seabird assemblage	b	Potential for a LSE (Screened in)	Screened in for Leach's storm-petrel, gannet, guillemot and puffin, as above. Assemblage-only species indicated by (*).
UK9002381	Auskerry SPA	581	European storm-petrel	b	No LSE (Screened out)	Project is outside published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Distance across sea is very large (>750km); presence of significant numbers of birds originating from the site during non-breeding season is therefore unlikely.

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
						BDMPS data for this site not available.
			Arctic tern	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.
UK9002121	Marwick Head SPA	585	Black-legged kittiwake*	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.
			Common guillemot	b	No LSE (Screened out)	
			Seabird assemblage	b	No LSE (Screened out)	
UK9002371	Rousay SPA	589	Northern fulmar*	b	Potential for a LSE (Screened in)	Project is within the published foraging range (mean max +1SD) (including across-sea distance), and feature has been recorded during baseline surveys during the breeding season. Therefore, screened in for potential effects during the breeding season. Non-breeding season effects have also been considered.

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
			Arctic skua*	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.
			Black-legged kittiwake*	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.
			Arctic tern	b	No LSE (Screened out)	
			Common guillemot*	b	No LSE (Screened out)	
			Seabird assemblage	b	Potential for a LSE (Screened in)	Screened in for fulmar, as above. Assemblage-only species indicated by (*).
UK9001011	North Rona and Sula Sgeir SPA	597	Northern fulmar*	b	Potential for a LSE (Screened in)	Project is within the published foraging range (mean max +1SD) (including across-sea distance), and feature has been recorded during baseline surveys during the breeding season. Therefore, screened in for potential effects during the breeding season. Non-breeding season effects have

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
						also been considered.
			Leach's storm-petrel	b	Potential for a LSE (Screened in)	Project is within the published foraging range (mean max +1SD) (although outside across-sea distance), and although not recorded during baseline surveys presence is possible. Therefore, screened in for potential effects during the breeding and non-breeding season. BDMPS data for this site not available.
			Northern gannet	b	Potential for a LSE (Screened in)	Project beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened in for non-breeding season effects as species was recorded during baseline surveys, and >1% of birds within the BDMPS region during this period will originate from this population.
			Common guillemot	b	Potential for a LSE (Screened in)	
			European storm-petrel	b	No LSE (Screened out)	Project is outside published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Distance across sea is very large (>750km); presence of significant numbers of birds originating from the site during non-breeding season is therefore unlikely. BDMPS data for this site not available.
			Great black-backed gull*	b	No LSE (Screened	Project is beyond the published foraging range (mean max +1SD), therefore no

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
					out)	connectivity during the breeding season. Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.
			Black-legged kittiwake*	b	No LSE (Screened out)	
			Razorbill*	b	No LSE (Screened out)	
			Atlantic puffin*	b	No LSE (Screened out)	
			Seabird assemblage	b	Potential for a LSE (Screened in)	Screened in for fulmar, Leach's storm petrel, gannet and guillemot, as above. Assemblage-only species indicated by (*).
UK9002431	Calf of Eday SPA	599	Northern fulmar*	b	Potential for a LSE (Screened in)	Project is within the published foraging range (mean max +1SD) (including across-sea distance), and feature has been recorded during baseline surveys during the breeding season. Therefore, screened in for potential effects during the breeding season. Non-breeding season effects have also been considered.
			Great cormorant*	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season effects; although species was recorded
			Great black-backed gull*	b	No LSE (Screened	

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
					out)	during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.
			Black-legged kittiwake*	b	No LSE (Screened out)	
			Common guillemot*	b	No LSE (Screened out)	
			Seabird assemblage	b	Potential for a LSE (Screened in)	Screened in for fulmar, as above. Assemblage-only species indicated by (*).
UK9002101	West Westray SPA	603	Northern fulmar*	b	Potential for a LSE (Screened in)	Project is within the published foraging range (mean max +1SD) (including across-sea distance), and feature has been recorded during baseline surveys during the breeding season. Therefore, screened in for potential effects during the breeding season. Non-breeding season effects have also been considered.
			Black-legged kittiwake*	b	Potential for a LSE (Screened in)	Project beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened in for non-breeding season effects as species was recorded during baseline surveys, and >1% of birds within the BDMPS region during this period will originate from this population.

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
			Arctic skua*	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.
			Arctic tern	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.
			Common guillemot	b	No LSE (Screened out)	
			Razorbill*	b	No LSE (Screened out)	
			Seabird assemblage	b	Potential for a LSE (Screened in)	Screened in for fulmar and kittiwake, as above. Assemblage-only species indicated by (*).

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
UK9002111	Papa Westray (North Hill and Holm) SPA	615	Arctic skua	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.
			Arctic tern	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.
UK9002091	Fair Isle SPA	639	Northern fulmar*	b	Potential for a LSE (Screened in)	Project is within the published foraging range (mean max +1SD) (including across-sea distance), and feature has been recorded during baseline surveys during the breeding season. Therefore, screened in for potential effects during the breeding season. Non-breeding season effects have also been considered.
			Great skua*	b	Potential for a LSE (Screened in)	
			Northern gannet*	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season.

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
			European shag*	b	No LSE (Screened out)	Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.
			Arctic skua*	b	No LSE (Screened out)	
			Black-legged kittiwake*	b	No LSE (Screened out)	
			Arctic tern	b	No LSE (Screened out)	
			Common guillemot	b	No LSE (Screened out)	
			Razorbill*	b	No LSE (Screened out)	
			Atlantic puffin*	b	No LSE (Screened out)	
			Seabird assemblage	b	Potential for a LSE (Screened in)	Screened in for fulmar and great skua, as above. Assemblage-only species indicated by (*).

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
UK9020331	Seas off Foula SPA	675	Northern fulmar*	b	No LSE (Screened out)	SPA site boundary encompasses core areas used during the breeding and non-breeding seasons. No evidence for connectivity between this feature and the Project.
			Great skua	b	No LSE (Screened out)	
			Northern fulmar*	nb	No LSE (Screened out)	
			Great skua	nb	No LSE (Screened out)	
			Arctic skua*	b	No LSE (Screened out)	
			Common guillemot*	b	No LSE (Screened out)	
			Common guillemot*	nb	No LSE (Screened out)	
			Atlantic puffin*	b	No LSE (Screened out)	

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
			Seabird assemblage	b	No LSE (Screened out)	
			Seabird assemblage	nb	No LSE (Screened out)	
UK9002511	Sumburgh Head SPA	681	Northern fulmar*	b	Potential for a LSE (Screened in)	Project is within the published foraging range (mean max +1SD) (including across-sea distance), and feature has been recorded during baseline surveys during the breeding season. Therefore, screened in for potential effects during the breeding season. Non-breeding season effects have also been considered.
			Black-legged kittiwake*	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.
			Arctic tern	b	No LSE (Screened out)	
			Common guillemot*	b	No LSE (Screened out)	
			Seabird assemblage	b	Potential for a LSE (Screened in)	Screened in for fulmar, as above. Assemblage-only species indicated by (*).

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
UK9002361	Mousa SPA	700	European storm-petrel	b	No LSE (Screened out)	Project is outside published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Distance across sea is very large (>750km); presence of significant numbers of birds originating from the site during non-breeding season is therefore unlikely. BDMPS data for this site not available.
			Arctic tern	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.
UK9002061	Foula SPA	701	Northern fulmar*	b	Potential for a LSE (Screened in)	Project is within the published foraging range (mean max +1SD) (including across-sea distance), and feature has been recorded during baseline surveys during the breeding season. Therefore, screened in for potential effects during the breeding season. Non-breeding season effects have also been considered.
			Great skua	b	Potential for a LSE (Screened in)	
			Red-throated diver	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
						effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.
			Leach's storm-petrel	b	No LSE (Screened out)	Project is outside published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Distance across sea is very large (>850km); presence of significant numbers of birds originating from the site during non-breeding season is therefore unlikely. BDMPS data for this site not available.
			Arctic skua*	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.
			European shag	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.
			Black-legged kittiwake*	b	No LSE (Screened out)	
			Arctic tern	b	No LSE	

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
					(Screened out)	
			Common guillemot	b	No LSE (Screened out)	
			Razorbill*	b	No LSE (Screened out)	
			Atlantic puffin	b	Potential for a LSE (Screened in)	Project beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened in for non-breeding season effects as species was recorded during baseline surveys, and >1% of birds within the BDMPS region during this period will originate from this population.
			Seabird assemblage	b	Potential for a LSE (Screened in)	Screened in for fulmar, great skua, red-throated diver and puffin, as above. Assemblage-only species indicated by (*).
UK9002081	Noss SPA	715	Northern fulmar*	b	Potential for a LSE (Screened in)	Project is within the published foraging range (mean max +1SD) (including across-sea distance), and feature has been recorded during baseline surveys during the breeding season. Therefore, screened in for potential effects during the breeding season. Non-breeding season effects have also been considered.
			Great skua	b	Potential for a LSE (Screened in)	

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
			Northern gannet	b	Potential for a LSE (Screened in)	Project beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened in for non-breeding season effects as species was recorded during baseline surveys, and >1% of birds within the BDMPS region during this period will originate from this population.
			Black-legged kittiwake*	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.
			Common guillemot	b	No LSE (Screened out)	
			Atlantic puffin*	b	No LSE (Screened out)	
			Seabird assemblage	b	Potential for a LSE (Screened in)	Screened in for fulmar, great skua ang gannet, as above. Assemblage-only species indicated by (*).

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
UK9002051	Papa Stour SPA	730	Arctic tern	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.
UK9002041	Ronas Hill - North Roe and Tingon SPA and Ramsar Site	753	Red-throated diver	b	No LSE (screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.
			Great skua	b	Potential for a LSE (Screened in)	Project is within the published foraging range (mean max +1SD) (including across-sea distance), and feature has been recorded during baseline surveys during the breeding season. Therefore, screened in for potential effects during the breeding season. Non-breeding season effects have also been considered.

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
UK9002031	Fetlar SPA	763	Northern fulmar*	b	Potential for a LSE (Screened in)	Project is within the published foraging range (mean max +1SD) (including across-sea distance), and feature has been recorded during baseline surveys during the breeding season. Therefore, screened in for potential effects during the breeding season. Non-breeding season effects have also been considered.
			Great skua	b	Potential for a LSE (Screened in)	
			Arctic skua*	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.
			Arctic tern	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.
			Whimbrel	b	No LSE (Screened out)	Due to distance from the SPA these features are very unlikely to occur at the windfarm site No connectivity between the

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
			Red-necked phalarope	b	No LSE (Screened out)	Project and this feature is likely.
			Dunlin	b	No LSE (Screened out)	
			Seabird assemblage	b	Potential for a LSE (Screened in)	Screened in for fulmar and great skua, as above. Assemblage-only species indicated by (*).
UK9002021	Ramna Stacks and Gruney SPA	771	Leach's storm-petrel	b	No LSE (Screened out)	Project is outside published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Distance across sea is very large (>900km); presence of significant numbers of birds originating from the site during non-breeding season is therefore unlikely. BDMPS data for this site not available.
UK9002011	Hermaness, Saxa Vord and Valla Field SPA	782	Northern fulmar*	b	Potential for a LSE (Screened in)	Project is within the published foraging range (mean max +1SD) (including across-sea distance), and feature has been recorded during baseline surveys during the breeding season. Therefore, screened in for potential effects during the breeding season. Non-breeding season effects have also been considered.
			Great skua	b	Potential for a LSE (Screened in)	

Site code	Site	Distance (km)	Qualifying feature	Season (b= breeding; nb=non-breeding)	Significance of effect (alone or in-combination)	Rationale
			Northern gannet	b	Potential for a LSE (Screened in)	Project beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened in for non-breeding season effects as species was recorded during baseline surveys, and >1% of birds within the BDMPS region during this period will originate from this population.
			Atlantic puffin	b	Potential for a LSE (Screened in)	
			European shag*	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.
			Red-throated diver	b	No LSE (Screened out)	
			Black-legged kittiwake*	b	No LSE (Screened out)	
			Common guillemot*	b	No LSE (Screened out)	
			Seabird assemblage	b	Potential for a LSE (Screened in)	Screened in for fulmar, great skua, gannet, red-throated diver and puffin, as above. Assemblage-only species indicated by (*).

13 Appendix 3 Screening outcome for transboundary SPA and Ramsar Sites with ornithology qualifying features

Site code	Site	Distance (km)	Qualifying feature	Season	Significance of effect (alone or in-combination)	Rationale
UK21001 (1642)	Ballaugh Curragh Ramsar Site	85	Hen harrier	nb	Potential for a LSE (Screened in)	Potential risk of collision with the Project during migratory flights to and from the site in numbers sufficient for LSE to be a possibility. Significant barrier effects were considered unlikely.
IE0004014	Rockabill SPA	150.56	Roseate tern	b	No LSE (Screened out)	The Project lies beyond the published breeding foraging range for the tern species associated with the SPA (mean maximum foraging range +1SD from Woodward *et al.* (2019): Roseate tern = 24km; common tern = 27km; Arctic tern = 41km), and therefore there is no connectivity during the breeding season. During the non-breeding season these species migrate to and from their wintering grounds. No roseate terns were recorded during site surveys, and both Arctic and common terns were recorded in low numbers. The total predicted annual collision mortality for these latter species was estimated at 0.37 and 0.22 birds respectively. These values are considered precautionary, and once apportioned to individual SPAs would be substantially less. It is very unlikely that any measurable collision mortality would affect these species from Rockabill SPA or any other
			Common tern	b	No LSE (Screened out)	
			Artic tern	b	No LSE (Screened out)	

Site code	Site	Distance (km)	Qualifying feature	Season	Significance of effect (alone or in-combination)	Rationale
						SPA population.
004236	North West Irish Sea SPA	120.35	Red-throated Diver Great Northern Diver Fulmar Manx Shearwater Cormorant Shag Common Scoter Little Gull Black-headed Gull Common Gull Lesser Black-backed Gull Herring Gull Great Black-backed Gull Kittiwake Roseate Tern Common Tern Arctic Tern Little Tern Guillemot Razorbill Puffin	b and nb	No LSE (Screened out)	This site was designated in 2023 to provide supporting habitat to breeding seabird SPAs along the Irish coast. Given the distance between the SPA and the Project site, there are no mechanisms or pathways arising from the Project likely to affect these supporting habitats. Therefore, there would be no likely significant effect on this SPA, and no requirement for an appropriate assessment. It is noted that the seabird populations that the SPA supports have been assessed as part of their respective SPA breeding colonies.

Site code	Site	Distance (km)	Qualifying feature	Season	Significance of effect (alone or in-combination)	Rationale
4069	Lambay Island SPA	156	Guillemot	b	Potential for a LSE (Screened in)	Project is within the published foraging range (mean max +1SD), and feature has been recorded during baseline surveys during the breeding season. Therefore, screened in for potential effects during the breeding season. Non-breeding season effects have also been considered.
			Puffin	b	Potential for a LSE (Screened in)	
			Fulmar	b	Potential for a LSE (Screened in)	
			Lesser black-backed gull	b	Potential for a LSE (Screened in)	
			Kittiwake	b	Potential for a LSE (Screened in)	
			Razorbill	b	Potential for a LSE (Screened in)	
			Herring gull	b	Potential for a LSE (Screened in)	Project beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened in for non-breeding season effects as species was recorded during baseline surveys, and >1% of birds within the BDMPS region during this period will originate from this population.
			Shag	b	Potential for a LSE (Screened in)	
			Cormorant	b	Potential for a LSE (Screened in)	

Site code	Site	Distance (km)	Qualifying feature	Season	Significance of effect (alone or in-combination)	Rationale
4113	Howth Head Coast SPA	159	Kittiwake	b	Potential for a LSE (Screened in)	Project is within the published foraging range (mean max +1SD), and feature has been recorded during baseline surveys during the breeding season. Therefore, screened in for potential effects during the breeding season. Non-breeding season effects have also been considered.
4117	Ireland's Eye SPA	159	Kittiwake	b	Potential for a LSE (Screened in)	Project is within the published foraging range (mean max +1SD), and feature has been recorded during baseline surveys during the breeding season. Therefore, screened in for potential effects during the breeding season. Non-breeding season effects have also been considered.
			Razorbill	b	Potential for a LSE (Screened in)	
			Guillemot	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.
			Herring gull	b	No LSE (Screened out)	
			Cormorant	b	Potential for a LSE (Screened in)	Project beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened in for non-breeding season effects as species was recorded during baseline surveys, and >1% of birds within the BDMPS region during this period will originate from this population.

Site code	Site	Distance (km)	Qualifying feature	Season	Significance of effect (alone or in-combination)	Rationale
4127	Wicklow Head SPA	176	Kittiwake	b	Potential for a LSE (Screened in)	Project is within the published foraging range (mean max +1SD), and feature has been recorded during baseline surveys during the breeding season. Therefore, screened in for potential effects during the breeding season. Non-breeding season effects have also been considered.
4002	Saltee Islands SPA	265	Puffin	b	Potential for a LSE (Screened in)	Project is within the published foraging range (mean max +1SD), and feature has been recorded during baseline surveys during the breeding season. Therefore, screened in for potential effects during the breeding season. Non-breeding season effects have also been considered.
			Fulmar	b	Potential for a LSE (Screened in)	
			Gannet	b	Potential for a LSE (Screened in)	
			Kittiwake	b	Potential for a LSE (Screened in)	
			Guillemot	b	Potential for a LSE (Screened in)	Project beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened in for non-breeding season effects as species was recorded during baseline surveys, and >1% of birds within the BDMPS region during this period will originate from this population.
			Shag	b	Potential for a LSE (Screened in)	
			Cormorant	b	Potential for a LSE (Screened in)	
			Razorbill	b	Potential for a LSE (Screened in)	
			Herring gull	b	No LSE (Screened	Project is beyond the published foraging range

Site code	Site	Distance (km)	Qualifying feature	Season	Significance of effect (alone or in-combination)	Rationale
					out)	(mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.
			Lesser black-backed gull	b	No LSE (Screened out)	
4194	Horn Head to Fanad Head SPA	291	Fulmar	b	Potential for a LSE (Screened in)	Project is within the published foraging range (mean max +1SD), and feature has been recorded during baseline surveys during the breeding season. Therefore, screened in for potential effects during the breeding season. Non-breeding season effects have also been considered.
			Kittiwake	b	Potential for a LSE (Screened in)	
			Guillemot	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.
			Shag	b	Potential for a LSE (Screened in)	Project beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened in for non-breeding season effects as species was recorded during baseline surveys, and >1% of birds within the BDMPS region during this period will originate from this population.
			Cormorant	b	Potential for a LSE (Screened in)	

Site code	Site	Distance (km)	Qualifying feature	Season	Significance of effect (alone or in-combination)	Rationale
4150	West Donegal Coast SPA	327	Fulmar	b	Potential for a LSE (Screened in)	Project is within the published foraging range (mean max +1SD), and feature has been recorded during baseline surveys during the breeding season. Therefore, screened in for potential effects during the breeding season. Non-breeding season effects have also been considered.
			Guillemot	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.
			Herring gull	b	No LSE (Screened out)	
			Kittiwake	b	No LSE (Screened out)	
			Shag	b	Potential for a LSE (Screened in)	Project beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened in for non-breeding season effects as species was recorded during baseline surveys, and >1% of birds within the BDMPS region during this period will originate from this population.
			Cormorant	b	Potential for a LSE (Screened in)	
4073	Tory Island SPA	329	Fulmar	b	Potential for a LSE (Screened in)	Project is within the published foraging range (mean max +1SD), and feature has been recorded during baseline surveys during the breeding season. Therefore, screened in for potential effects during the breeding season. Non-breeding season effects have also been considered.

Site code	Site	Distance (km)	Qualifying feature	Season	Significance of effect (alone or in-combination)	Rationale
			Razorbill	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.
			Puffin	b	No LSE (Screened out)	
4005	Cliffs of Moher SPA	387	Fulmar	b	Potential for a LSE (Screened in)	Project is within the published foraging range (mean max +1SD), and feature has been recorded during baseline surveys during the breeding season. Therefore, screened in for potential effects during the breeding season. Non-breeding season effects have also been considered.
			Guillemot	b	Potential for a LSE (Screened in)	Project beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened in for non-breeding season effects as species was recorded during baseline surveys, and >1% of birds within the BDMPS region during this period will originate from this population.
			Kittiwake	b	Potential for a LSE (Screened in)	
			Razorbill	b	Potential for a LSE (Screened in)	
			Puffin	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.

Site code	Site	Distance (km)	Qualifying feature	Season	Significance of effect (alone or in-combination)	Rationale
4072	Stags of Broad Haven SPA	400	Leach's petrel	b	Potential for a LSE (Screened in)	Project is within the published foraging range (mean max +1SD), and feature has been recorded during baseline surveys during the breeding season. Therefore, screened in for potential effects during the breeding season. Non-breeding season effects have also been considered.
			Storm petrel	b	No LSE (Screened out)	Project beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Not recorded during baseline surveys, presence of significant numbers of birds originating from the site during non-breeding season is therefore unlikely. BDMPS data for this species not available.
4136	Clare Island SPA	408	Fulmar	b	Potential for a LSE (Screened in)	Project is within the published foraging range (mean max +1SD), and feature has been recorded during baseline surveys during the breeding season. Therefore, screened in for potential effects during the breeding season. Non-breeding season effects have also been considered.
			Guillemot	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.
			Shag	b	No LSE (Screened out)	
			Kittiwake	b	No LSE (Screened out)	

Site code	Site	Distance (km)	Qualifying feature	Season	Significance of effect (alone or in-combination)	Rationale
			Razorbill	b	No LSE (Screened out)	
			Common gull	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Although species has been recorded during baseline surveys, distance from site indicates that presence of significant numbers of birds originating from the site within the Project area is unlikely. BDMPS data for this species not available.
4111	Duvillaun Islands SPA	420	Fulmar	b	Potential for a LSE (Screened in)	Project is within the published foraging range (mean max +1SD), and feature has been recorded during baseline surveys during the breeding season. Therefore, screened in for potential effects during the breeding season. Non-breeding season effects have also been considered.
			Storm petrel	b	No LSE (Screened out)	Project beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Not recorded during baseline surveys, presence of significant numbers of birds originating from the site during non-breeding season is therefore unlikely. BDMPS data for this species not available.
4144	High Island, Inishshark and	421	Fulmar	b	Potential for a LSE (Screened in)	Project is within the published foraging range (mean max +1SD), and feature has been recorded during baseline surveys during the

Site code	Site	Distance (km)	Qualifying feature	Season	Significance of effect (alone or in-combination)	Rationale
	Davillaun SPA					breeding season. Therefore, screened in for potential effects during the breeding season. Non-breeding season effects have also been considered.
			Arctic tern	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.
4189	Kerry Head SPA	426	Fulmar	b	Potential for a LSE (Screened in)	Project is within the published foraging range (mean max +1SD), and feature has been recorded during baseline surveys during the breeding season. Therefore, screened in for potential effects during the breeding season. Non-breeding season effects have also been considered.
4170	Cruagh Island SPA	428	Manx shearwater	b	Potential for a LSE (Screened in)	Project is within the published foraging range (mean max +1SD), and feature has been recorded during baseline surveys during the breeding season. Therefore, screened in for potential effects during the breeding season. Non-breeding season effects have also been considered.

Site code	Site	Distance (km)	Qualifying feature	Season	Significance of effect (alone or in-combination)	Rationale
4153	Dingle Peninsula SPA	453	Fulmar	b	Potential for a LSE (Screened in)	Project is within the published foraging range (mean max +1SD), and feature has been recorded during baseline surveys during the breeding season. Therefore, screened in for potential effects during the breeding season. Non-breeding season effects have also been considered.
4154	Iveragh Peninsula SPA	463	Fulmar	b	Potential for a LSE (Screened in)	Project is within the published foraging range (mean max +1SD), and feature has been recorded during baseline surveys during the breeding season. Therefore, screened in for potential effects during the breeding season. Non-breeding season effects have also been considered.
			Kittiwake	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.
			Guillemot	b	No LSE (Screened out)	
4008	Blasket Islands SPA	491	Fulmar	b	Potential for a LSE (Screened in)	Project is within the published foraging range (mean max +1SD), and feature has been recorded during baseline surveys during the breeding season. Therefore, screened in for potential effects during the breeding season. Non-breeding season effects have also been considered.
			Manx shearwater	b	Potential for a LSE (Screened in)	

Site code	Site	Distance (km)	Qualifying feature	Season	Significance of effect (alone or in-combination)	Rationale
			Puffin	b	Potential for a LSE (Screened in)	Project beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened in for non-breeding season effects as species was recorded during baseline surveys, and >1% of birds within the BDMPS region during this period will originate from this population.
			Lesser black-backed gull	b	Potential for a LSE (Screened in)	
			Guillemot	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.
			Storm petrel	b	No LSE (Screened out)	
			Herring gull	b	No LSE (Screened out)	
			Shag	b	No LSE (Screened out)	
			Kittiwake	b	No LSE (Screened out)	
			Arctic tern	b	No LSE (Screened out)	
4175	Deenish Island and Scariff Island SPA	493	Fulmar	b	Potential for a LSE (Screened in)	Project is within the published foraging range (mean max +1SD), and feature has been recorded during baseline surveys during the breeding season. Therefore, screened in for potential effects during the breeding season. Non-breeding season effects have also been considered.
			Manx shearwater	b	Potential for a LSE (Screened in)	

Site code	Site	Distance (km)	Qualifying feature	Season	Significance of effect (alone or in-combination)	Rationale
			Storm petrel	b	No LSE (Screened out)	Project beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Not recorded during baseline surveys, presence of significant numbers of birds originating from the site during non-breeding season is therefore unlikely. BDMPS data for this species not available.
			Lesser black-backed gull	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.
			Arctic tern	b	No LSE (Screened out)	
4003	Puffin Island SPA	498	Fulmar	b	Potential for a LSE (Screened in)	Project is within the published foraging range (mean max +1SD), and feature has been recorded during baseline surveys during the breeding season. Therefore, screened in for potential effects during the breeding season. Non-breeding season effects have also been considered.
			Manx shearwater	b	Potential for a LSE (Screened in)	
			Puffin	b	Potential for a LSE (Screened in)	Project beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened in for non-breeding season effects as species was recorded during baseline surveys, and >1% of birds within the BDMPS region during this period will originate from this population.

Site code	Site	Distance (km)	Qualifying feature	Season	Significance of effect (alone or in-combination)	Rationale
			Storm petrel	b	No LSE (Screened out)	Project beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Not recorded during baseline surveys, presence of significant numbers of birds originating from the site during non-breeding season is therefore unlikely. BDMPS data for this species not available.
			Guillemot	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.
			Lesser black-backed gull	b	No LSE (Screened out)	
4066	The Bull and The Cow Rocks SPA	505	Gannet	b	Potential for a LSE (Screened in)	Project is within the published foraging range (mean max +1SD), and feature has been recorded during baseline surveys during the breeding season. Therefore, screened in for potential effects during the breeding season. Non-breeding season effects have also been considered.
			Puffin	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.

Site code	Site	Distance (km)	Qualifying feature	Season	Significance of effect (alone or in-combination)	Rationale
			Storm petrel	b	No LSE (Screened out)	Project beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Not recorded during baseline surveys, presence of significant numbers of birds originating from the site during non-breeding season is therefore unlikely. BDMPS data for this species not available.
4007	Skelligs SPA	508	Gannet	b	Potential for a LSE (Screened in)	Project is within the published foraging range (mean max +1SD), and feature has been recorded during baseline surveys during the breeding season. Therefore, screened in for potential effects during the breeding season. Non-breeding season effects have also been considered.
			Manx shearwater	b	Potential for a LSE (Screened in)	
			Fulmar	b	Potential for a LSE (Screened in)	
			Puffin	b	Potential for a LSE (Screened in)	Project beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened in for non-breeding season effects as species was recorded during baseline surveys, and >1% of birds within the BDMPS region during this period will originate from this population.
			Storm petrel	b	No LSE (Screened out)	Project beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Not recorded during baseline surveys, presence of significant numbers of birds originating from the site during non-breeding season is therefore unlikely. BDMPS data for this species not available.

Site code	Site	Distance (km)	Qualifying feature	Season	Significance of effect (alone or in-combination)	Rationale
			Kittiwake	b	No LSE (Screened out)	Project is beyond the published foraging range (mean max +1SD), therefore no connectivity during the breeding season. Screened out for non-breeding season effects; although species was recorded during baseline surveys, <1% of birds within the BDMPS region during this period will originate from this population.
			Guillemot	b	No LSE (Screened out)	

14 Appendix 4 Bird species considered in the HRA screening

English name	Scientific name
Arctic skua	*Stercorarius parasiticus*
Arctic tern	*Sterna paradisaea*
Barnacle goose	*Branta leucopsis*
Bar-tailed godwit	*Limosa lapponica*
Bewick's swan/Tundra swan	*Cygnus columbianus*
Black-headed gull	*Chroicocephalus ridibundus*
Black-tailed godwit	*Limosa limosa*
Black-throated diver	*Gavia arctica*
Chough/Red-billed chough	*Pyrrhocorax pyrrhocorax*
Common gull/mew gull	*Larus canus*
Common Scoter/black scoter	*Melanitta nigra*
Common tern	*Sterna hirundo*
Cormorant/great cormorant	*Phalacrocorax carbo*
Curlew/Eurasian curlew	*Numenius arquata*
Dunlin	*Calidris alpina*
Eider/common eider	*Somateria mollissima*
Fulmar/northern fulmar	*Fulmarus glacialis*
Gannet/northern gannet	*Morus bassanus*
Golden plover/European golden plover	*Pluvialis apricaria*
Goldeneye/common goldeneye	*Bucephala clangula*
Goosander	*Mergus merganser*
Great black-backed gull	*Larus marinus*
Great crested grebe	*Podiceps cristatus*
Great skua	*Stercorarius skua*
Grey plover	*Pluvialis squatarola*
Guillemot/common guillemot	*Uria aalge*
Hen harrier	*Circus cyaneus*
Herring gull	*Larus argentatus*
Kittiwake/black-legged kittiwake	*Rissa tridactyla*

English name	Scientific name
Knot/red knot	*Calidris canutus*
Lapwing/northern lapwing	*Vanellus vanellus*
Leach's petrel/Leach's storm-petrel	*Oceanodroma leucorhoa*
Lesser black-backed gull	*Larus fuscus*
Little egret	*Egretta garzetta*
Little gull	*Hydrocoloeus minutus*
Little tern	*Sternula albifrons*
Manx shearwater	*Puffinus puffinus*
Mediterranean gull	*Ichthyaetus melanocephalus*
Merlin	*Falco columbarius*
Oystercatcher/Eurasian oystercatcher	*Haematopus ostralegus*
Peregrine falcon	*Falco peregrinus*
Pink-footed goose	*Anser brachyrhynchus*
Pintail/northern pintail	*Anas acuta*
Puffin/Atlantic puffin	*Fratercula arctica*
Razorbill	*Alca torda*
Red kite	*Milvus milvus*
Red-breasted merganser	*Mergus serrator*
Red-necked phalarope	*Phalaropus lobatus*
Redshank/common redshank	*Tringa totanus*
Red-throated diver	*Gavia stellata*
Ringed plover	*Charadrius hiaticula*
Roseate tern	*Sterna dougallii*
Ruff	*Calidris pugnax*
Sanderling	*Calidris alba*
Sandwich tern	*Thalasseus sandvicensis*
Scaup/greater scaup	*Aythya marila*
Shag/European shag	*Phalacrocorax aristotelis*
Shelduck/common shelduck	*Tadorna tadorna*
Short-eared owl	*Asio flammeus*
Storm petrel/European storm-petrel	*Hydrobates pelagicus*
Teal/Eurasian teal	*Anas crecca*

English name	Scientific name
Turnstone/ruddy turnstone	*Arenaria interpres*
Whimbrel	*Numenius phaeopus*
Whooper swan	*Cygnus cygnus*
Wigeon/Eurasian wigeon	*Mareca penelope*