

# Outer Dowsing Offshore Wind

## Habitats Regulations Assessment

### Habitat Regulations Assessment Screening Report

#### Document 7.2

Date: March 2024

Document Reference: 7.2

Pursuant to APFP Regulation: 5(2)(g)

Rev: 1.0

Company:	<b>Outer Dowsing Offshore Wind</b>	Asset:	<b>Whole Asset</b>			
Project:	<b>Whole Windfarm</b>	Sub Project/Package:	Whole Asset			
Document Title or Description:	Part 7 HRA Screening Report					
Internal Document Number:	PP1-ODOW-DEV-CS-REP-0100	3 <sup>rd</sup> Party Doc No (If applicable):	N/A			
Outer Dowsing Offshore Wind accepts no liability for the accuracy or completeness of the information in this document nor for any loss or damage arising from the use of such information.						
<b>Rev No.</b>	<b>Date</b>	<b>Status / Reason for Issue</b>	<b>Author</b>	<b>Checked by</b>	<b>Reviewed by</b>	<b>Approved by</b>
V1.0	March 2024	DCO Application	GoBe	Outer Dowsing	Shepherd and Wedderburn	Outer Dowsing

## Table of Contents

Acronyms & Definitions .....	6
Abbreviations / Acronyms .....	6
Acronyms & Terminology .....	8
1 Introduction .....	14
1.1 Project Background .....	14
1.2 Purpose of the Report .....	14
1.3 Consultation on the Screening Report .....	15
1.4 Project Overview .....	28
1.4.1 Offshore .....	28
1.4.2 Onshore .....	29
1.4.3 Artificial Nesting Structures .....	31
1.4.4 Offshore Reactive Compensation Platform .....	31
1.4.5 Biogenic promoting infrastructure .....	32
2 The HRA Process .....	33
2.1 Legislative Context .....	33
2.1.1 Habitats Regulations .....	33
2.1.2 European Sites Post-EU Exit .....	33
2.2 The HRA Process .....	34
3 Environmental Baseline .....	35
3.1 Introduction .....	35
3.2 Subtidal and intertidal benthic ecology .....	37
3.2.1 Existing Data Sources .....	37
3.2.2 Site Specific Surveys .....	38
3.2.3 Baseline .....	38
3.3 Marine Mammals .....	39
3.3.1 Existing Data Sources .....	39
3.3.2 Site Specific Surveys .....	40
3.3.3 Baseline .....	40
3.4 Offshore and Intertidal Ornithology .....	42
3.4.1 Existing Data Sources .....	42
3.4.2 Site Specific Surveys .....	43
3.4.3 Baseline .....	43

3.5	Migratory Fish .....	44
3.5.1	Existing Data Sources .....	44
3.5.2	Site Specific Surveys.....	45
3.5.3	Baseline .....	45
3.6	Onshore Ecology and Ornithology .....	45
3.6.1	Existing Data Sources .....	45
3.6.2	Site Specific Surveys.....	46
3.6.3	Baseline .....	46
4	Determination of Screening Distances .....	50
4.1	Determination Process.....	50
4.2	Screening Distances Applied for Subtidal and Intertidal Benthic Receptors .....	50
4.3	Screening Distances Applied for Marine Mammal Receptors .....	50
4.4	Screening Distances Applied for Offshore and Intertidal Ornithology Receptors .....	53
4.5	Screening Distances Applied for Migratory Fish Receptors .....	55
4.6	Screening Distances Applied for Onshore Ecology and Ornithology Receptors .....	55
5	Screening .....	56
5.1	Screening Consultation .....	56
5.2	Subtidal and Intertidal Benthic Ecology Screening .....	56
5.3	Marine Mammal Screening.....	65
5.4	Offshore and Intertidal Ornithology Screening.....	72
5.5	Migratory Fish Screening.....	103
5.6	Onshore Screening .....	108
6	In-Combination Assessment .....	119
6.1	Approach to the In-Combination Assessment .....	119
6.2	Subtidal and Intertidal Benthic Ecology .....	131
6.3	Marine Mammals .....	133
6.4	Offshore and Intertidal Ornithology .....	134
6.5	Migratory Fish .....	135
6.6	Onshore Ecology and Ornithology .....	136
7	Conclusion of Potential for LSE (Alone and In-Combination).....	138
7.1	Subtidal and Intertidal Benthic Ecology .....	138
7.2	Marine Mammals .....	141
7.3	Offshore and Intertidal Ornithology .....	143

7.4	Migratory Fish .....	151
7.5	Onshore Ecology and Ornithology .....	151
8	References .....	161

## Table of Tables

Table 1.1	Comments received from Natural England.....	16
Table 1.2	WTG Maximum Design Scenario.....	28
Table 4.1:	Marine Mammal Receptors with overlapping MU's with the Project.....	51
Table 4.2:	Site Selection Criteria.....	53
Table 4.3:	MMF Range, Standard Deviation (SD) and MMF Range +1SD of UK Breeding Bird Species used to Screen against Criterion 2 (Woodward <i>et al.</i> , 2019). .....	54
Table 5.1:	Benthic Ecology Receptor Group Potential Effects.....	56
Table 5.2:	Potential for LSE for Subtidal and Intertidal Benthic Ecology.....	59
Table 5.3:	Marine Mammal Receptor Group Potential Effects .....	65
Table 5.4:	Marine Mammal Site Screening.....	67
Table 5.5:	Offshore and Intertidal Ornithology Receptor Group Potential Effects .....	72
Table 5.6:	Offshore and Intertidal Ornithology Screening .....	74
Table 5.7:	Migratory Fish Receptor Group Potential Effects.....	103
Table 5.8:	Migratory Fish Screening .....	106
Table 5.9:	Summary of Potential Effects on European and Ramsar Sites (Onshore) .....	108
Table 5.10:	Potential for LSE for Onshore Ecology .....	110
Table 6.1:	Designated Sites Screened in for the Project In-Combination .....	122
Table 6.2:	Plans and Projects considered for Subtidal and Intertidal Benthic Ecology.....	131
Table 6.3:	Plans and Projects considered for Marine Mammals .....	133
Table 6.4:	Plans and Projects considered for Offshore and Intertidal Ornithology .....	134
Table 6.5:	Plans and Projects considered for Migratory Fish .....	135
Table 6.6:	Plans and Projects considered for Onshore Ecology .....	136
Table 7.1:	Conclusion of LSE for Subtidal and Intertidal Benthic Ecology .....	138
Table 7.2:	Conclusion of LSE for Marine Mammals .....	141
Table 7.3:	Conclusion of LSE for Offshore and Intertidal Ornithology .....	143
Table 7.4:	Conclusion of LSE for Migratory Fish .....	151
Table 7.5:	Conclusion of LSE for Onshore Ecology.....	151

## Table of Figures

Figure 3.1:	The Project Array Area with the Onshore and Offshore Boundaries .....	36
Figure 4.1:	Relevant Marine Mammal MUs.....	52
Figure 5.1:	Designated Sites with a Potential for LSE for Subtidal and Intertidal Benthic Receptors .	64
Figure 5.2:	Designated Sites with a Potential for LSE for Marine Mammal Receptors .....	71
Figure 5.3:	Designated sites with a Potential for LSE for Offshore and Intertidal Ornithology Receptors .....	102

Figure 5.4: Designated sites with a Potential for LSE for Migratory Fish Receptors .....107  
Figure 5.5: Onshore Ecology European and Ramsar Sites .....118

## Acronyms & Definitions

### Abbreviations / Acronyms

Acronym	Meaning
AA	Appropriate Assessment
AC	Alternating Current
ADD	Acoustic Deterrent Devices
AfL	Agreement for Lease
ANS	Artificial Nesting Structure
AoS	Area of Search
BDMPS	Biologically Defined Minimum Population Scales
BGS	British Geological Survey
BTO	British Trust for Ornithology
CCS	Carbon Capture and Storage
Cefas	Centre for Environment, Fisheries and Aquaculture Science
CI	Confidence Interval
DAS	Digital Aerial Surveys
DCO	Development Consent Order
DECC	Department of Energy & Climate Change, now the Department for Energy Security and Net Zero (DESNZ)
Defra	Department for Environment, Food and Rural Affairs (Defra, not DEFRA)
DESNZ	Department for Energy Security and Net Zero, formerly Department of Business, Energy and Industrial Strategy (BEIS), which was previously Department of Energy & Climate Change (DECC)
dML	deemed Marine Licence
ECC	Export Cable Corridor (offshore ECC or indicative onshore ECC)
EDR	Effective Deterrence Range
EIA	Environmental Impact Assessment
EMF	Electromagnetic fields
EPP	Evidence Plan Process
ES	Environmental Statement
ETG	Expert Topic Group
EU	European Union
EUNIS	European Nature Information System
FFC	Flamborough and Filey Coast
GBS	Gravity Base Structure
GIS	Geographic Information System
GT R4 Ltd	The Applicant. The special project vehicle created in partnership between Corio Generation (a wholly owned Green Investment Group portfolio company), Gulf Energy Development (GULF) and TotalEnergies
GW	Gigawatt
HDD	Horizontal Directional Drilling
HRA	Habitats Regulations Assessment
HVAC	High Voltage Alternating Current

Acronym	Meaning
HVDC	High Voltage Direct Current
IAMMWG	the Inter Agency Marine Mammal Working Group
IBTS	International Bottom Trawl Survey
ICES	International Council for the Exploration of the Sea
IDRBNR	The Inner Dowsing, Race Bank and North Ridge
INNS	Invasive Non-Native Species
IROPI	Imperative Reasons of Over-riding Public Interest
IRZ	Impact Risk Zone
JCP	Joint Cetacean Protocol
JNCC	Joint Nature Conservation Committee
LAT	Lowest Astronomical Tide
LSE	Likely Significant Effect
MHWS	Mean High Water Springs
MLWS	Mean Low Water Springs
MMF	Mean-Maximum Foraging
MMOB	Marine Mammal Observer
MPA	Marine Protected Area
MU	Management Unit
NEWS	Non-Estuarine Wetland Survey
NGC	National Grid Carbon
NGET	National Grid Electricity Transmission
NGSS	National Grid Onshore Substation
NPS	National Policy Statement
NSIP	Nationally Significant Infrastructure Project
O&M	Operation and Maintenance
ODOW	Outer Dowsing Offshore Wind (The Project)
OnSS	Onshore Substation
ORCP	Offshore Reactive Compensation Platform
OSS	Offshore Substations
OWF	Offshore Windfarm
PAM	Passive Acoustic Monitoring
PEIR	Preliminary Environmental Information Report
RIAA	Report to Inform Appropriate Assessment
RSPB	Royal Society for the Protection of Birds
SAC	Special Area of Conservation
SCANS	Small Cetaceans in European Atlantic waters and the North Sea
SCI	Sites of Community Importance
SCOS	Special Committee on Seals
SD	Standard Deviation
SEL	Sound Exposure Level
SMRU	Sea Mammal Research Unit
SNCB	Statutory Nature Conservation Bodies
SoS	Secretary of State
SPA	Special Protection Area



Acronym	Meaning
SSC	Suspended Sediment Concentration
TCE	The Crown Estate
The Inspectorate	The Planning Inspectorate
UK	United Kingdom
UXO	Unexploded ordnance
WEBS	Wetland Bird Survey
WTG	Wind Turbine Generator
ZoI	Zone of Influence

## Acronyms & Terminology

Term	Definition
400kV cables	High-voltage cables linking the OnSS to the NGSS.
400kV cable corridor	The 400kV cable corridor is the area within which the 400kV cables connecting the onshore substation to the NGSS will be situated.
The Applicant	GT R4 Ltd. The Applicant making the application for a DCO. The Applicant is GT R4 Limited (a joint venture between Corio Generation, TotalEnergies and Gulf Energy Development (GULF)), trading as Outer Dowsing Offshore Wind. The Project is being developed by Corio Generation (a wholly owned Green Investment Group portfolio company), TotalEnergies and GULF.
AfL array area	The area of the seabed awarded to GT R4 Ltd. through an Agreement for Lease (AfL) for the development of an offshore windfarm, as part of The Crown Estate's Offshore Wind Leasing Round 4.
Array area	The area offshore within which the generating station (including wind turbine generators (WTG) and inter array cables), offshore accommodation platforms, offshore transformer substations and associated cabling will be positioned.
Baseline	The status of the environment at the time of assessment without the development in place.
Cable circuit	A number of electrical conductors necessary to transmit electricity between two points bundled as one cable or taking the form of separate cables, and may include one or more auxiliary cables (normally fibre optic cables).

Term	Definition
Cable ducts	A duct is a length of underground piping which is used to house the Cable Circuits.
Connection Area	An indicative area for the NGSS.
Deemed Marine Licence (dML)	A marine licence set out in a Schedule to the Development Consent Order and deemed to have been granted under Part 4 (marine licensing) of the Marine and Coastal Access Act 2009.
Development Consent Order (DCO)	An order made under the Planning Act 2008 granting development consent for a Nationally Significant Infrastructure Project (NSIP).
Effect	Term used to express the consequence of an impact. The significance of an effect is determined by correlating the magnitude of the impact with the sensitivity of the receptor, in accordance with defined significance criteria.
Environmental Impact Assessment (EIA)	A statutory process by which certain planned projects must be assessed before a formal decision to proceed can be made. It involves the collection and consideration of environmental information, which fulfils the assessment requirements of the EIA Regulations, including the publication of an Environmental Statement (ES).
Environmental Statement (ES)	The suite of documents that detail the processes and results of the EIA.
Export cables	High voltage cables which transmit power from the Offshore Substations (OSS) to the Onshore Substation (OnSS) via the Offshore Reactive Compensation Platform (ORCP) if required, which may include one or more auxiliary cables (normally fibre optic cables).
Habitats Regulations Assessment (HRA)	A process which helps determine likely significant effects and (where appropriate) assesses adverse impacts on the integrity of European conservation sites and Ramsar sites. The process consists of up to four stages of assessment: screening, appropriate assessment, assessment of alternative solutions and assessment of imperative reasons of over-riding public interest (IROPI) and compensatory measures.
Haul Road	The track within the onshore ECC which the construction traffic would use to facilitate construction.

Term	Definition
High Voltage Alternating Current (HVAC)	High voltage alternating current is the bulk transmission of electricity by alternating current (AC), whereby the flow of electric charge periodically reverses direction.
High Voltage Direct Current (HVDC)	High voltage direct current is the bulk transmission of electricity by direct current (DC), whereby the flow of electric charge is in one direction.
Impact	An impact to the receiving environment is defined as any change to its baseline condition, either adverse or beneficial.
Inter-array cables	Cables which connect the wind turbines to each other and to the offshore substation(s) which may include one or more auxiliary cables (normally fibre optic cables).
Interlink Cables	Cables which connect the Offshore Substations (OSS) to one another which may include one or more auxiliary cables (normally fibre optic cables).
Intertidal	The area between Mean High Water Springs (MHWS) and Mean Low Water Springs (MLWS)
Joint bays	An excavation formed with a buried concrete slab at sufficient depth to enable the jointing of high voltage power cables.
Landfall	The location at the land-sea interface where the offshore export cables and fibre optic cables will come ashore.
Link boxes	Underground metal chamber placed within a plastic and/or concrete pit where the metal sheaths between adjacent export cable sections are connected and earthed.
Maximum Design Scenario	The project design parameters, or a combination of project design parameters that are likely to result in the greatest potential for change in relation to each impact assessed
Mitigation	Mitigation measures are commitments made by the Project to reduce and/or eliminate the potential for significant effects to arise as a result of the Project. Mitigation measures can be embedded (part of the project design) or secondarily added to reduce impacts in the case of potentially significant effects.
National Grid Onshore Substation (NGSS)	The National Grid substation and associated enabling works to be developed by the National

Term	Definition
	Grid Electricity Transmission (NGET) into which the Project's 400kV Cables would connect.
National Policy Statement (NPS)	A document setting out national policy against which proposals for Nationally Significant Infrastructure Projects (NSIPs) will be assessed and decided upon
Offshore Export Cable Corridor (ECC)	The Offshore Export Cable Corridor (Offshore ECC) is the area within the Order Limits within which the export cables running from the array to landfall will be situated.
Offshore Reactive Compensation Platform (ORCP)	A structure attached to the seabed by means of a foundation, with one or more decks and a helicopter platform (including bird deterrents) housing electrical reactors and switchgear for the purpose of the efficient transfer of power in the course of HVAC transmission by providing reactive compensation
Offshore Substations (OSS)	A structure attached to the seabed by means of a foundation, with one or more decks and a helicopter platform (including bird deterrents), containing— (a) electrical equipment required to switch, transform, convert electricity generated at the wind turbine generators to a higher voltage and provide reactive power compensation; and (b) housing accommodation, storage, workshop auxiliary equipment, radar and facilities for operating, maintaining and controlling the substation or wind turbine generators
Onshore Export Cable Corridor (ECC)	The Onshore Export Cable Corridor (Onshore ECC) is the area within which, the export cables are routed within to the landfall to the onshore substation will be situated.
Onshore Infrastructure	The combined name for all onshore infrastructure associated with the Project from landfall to grid connection.
Onshore substation (OnSS)	The Project's onshore HVAC substation, containing electrical equipment, control buildings, lightning protection masts, communications masts, access, fencing and other associated equipment, structures or buildings; to enable connection to the National Grid
Outer Dowsing Offshore Wind (ODOW)	The Project.

Term	Definition
Order Limits	The area subject to the application for development consent. The limits shown on the works plans within which the Project may be carried out.
The Planning Inspectorate	The agency responsible for operating the planning process for Nationally Significant Infrastructure Projects (NSIPs).
Pre-construction and post-construction	The phases of the Project before and after construction takes place.
Preliminary Environmental Information Report (PEIR)	The PEIR was written in the style of a draft Environmental Statement (ES) and provided information to support and inform the statutory consultation process during the pre-application phase.
The Project	Outer Dowsing Offshore Wind, an offshore wind generating station together with associated onshore and offshore infrastructure.
Project Design Envelope	A description of the range of possible elements that make up the Project's design options under consideration, as set out in detail in the project description. This envelope is used to define the Project for Environmental Impact Assessment (EIA) purposes when the exact engineering parameters are not yet known. This is also often referred to as the "Rochdale Envelope" approach.
Receptor	A distinct part of the environment on which effects could occur and can be the subject of specific assessments. Examples of receptors include species (or groups) of animals or plants, people (often categorised further such as 'residential' or those using areas for amenity or recreation), watercourses etc.
Spudcan	Spudcans are the base cones on mobile-drilling jack-up platform. These inverted cones are mounted at the base of the jack-up and provide stability to lateral forces on the jack-up rig when deployed into ocean-bed systems.
Statutory consultee	Organisations that are required to be consulted by the Applicant, the Local Planning Authorities and/or The Planning Inspectorate during the pre-application and/or examination phases, and who also have a statutory responsibility in some form that may be relevant to the Project and the

Term	Definition
	DCO application. This includes those bodies and interests prescribed under Section 42 of the Planning Act 2008.
Study Area	Area(s) within which environmental impact may occur – to be defined on a receptor-by-receptor basis by the relevant technical specialist.
Subsea	Subsea comprises everything existing or occurring below the surface of the sea.
Transboundary impacts	Transboundary effects arise when impacts from the development within one European Economic Area (EEA) state affects the environment of another EEA state(s)
Transition Joint Bay (TJBs)	The offshore and onshore cable circuits are jointed on the landward side of the sea defences/beach in a Transition Joint Bay (TJB). The TJB is an underground chamber constructed of reinforced concrete which provides a secure and stable environment for the cable.
Trenched technique	Trenching is a construction excavation technique that involves digging a trench in the ground for the installation, maintenance, or inspection of pipelines, conduits, or cables.
Trenchless technique	Trenchless technology is an underground construction method of installing, repairing and renewing underground pipes, ducts and cables using techniques which minimize or eliminate the need for excavation. Trenchless technologies involve methods of new pipe installation with minimum surface and environmental disruptions. These techniques may include Horizontal Directional Drilling (HDD), thrust boring, auger boring, and pipe ramming, which allow ducts to be installed under an obstruction without breaking open the ground and digging a trench.
Wind turbine generator (WTG)	A structure comprising a tower, rotor with three blades connected at the hub, nacelle and ancillary electrical and other equipment which may include J-tube(s), transition piece, access and rest platforms, access ladders, boat access systems, corrosion protection systems, fenders and maintenance equipment, helicopter landing facilities and other associated equipment, fixed to a foundation.

# 1 Introduction

## 1.1 Project Background

1. In September 2019, The Crown Estate (TCE), as manager of the seabed, initiated a new leasing round process, known as the Offshore Wind Leasing Round 4, to make new areas of the seabed available for offshore wind development. It aimed to identify at least 7 Gigawatt (GW) of new offshore wind projects in English and Welsh waters, with the potential to deliver electricity for more than six million homes. The Offshore Wind Leasing Round 4 tender process concluded in February 2021, selecting six proposed new offshore wind projects in the waters around England and Wales.
2. GT R4 Limited (trading as Outer Dowsing Offshore Wind) hereafter referred to as the 'Applicant', is proposing to develop the Project. The Project will be located approximately 54km from the Lincolnshire coastline in the southern North Sea. The Project will include both offshore and onshore infrastructure including an offshore generating station (windfarm), export cables to landfall, the Offshore Reactive Compensation Platforms (ORCPs), onshore cables, connection to the electricity transmission network, ancillary and associated development and areas for the delivery of up to two Artificial Nesting Structures (ANS) and the creation of a biogenic reef (if these compensation measures are deemed to be required by the Secretary of State) (see Volume 1, Chapter 3: Project Description for full details (document reference 6.1.3)).

## 1.2 Purpose of the Report

3. This document has been produced to provide updated information to inform the 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 National Site Network and Ramsar sites of nature conservation importance. This step in the process and associated reporting requirements are further described in the following sections.
4. The assessment provided in this document is based on the current understanding of the baseline environment and the scope and nature of the proposed Project activities. Consultation on this Screening Report was undertaken alongside the Scoping Report and the advice received from stakeholders has been incorporated into this final Screening Report. Where relevant, further consultation was undertaken through the Evidence Plan Process (EPP). This HRA Screening Report is based on project information associated with the Project, desk-based information from other offshore windfarm projects in the vicinity (including Triton Knoll and the Dudgeon and Sheringham Shoal Offshore Windfarm Extensions), and any site-specific information currently available.

### 1.3 Consultation on the Screening Report

5. Feedback on the draft HRA Screening Report (Outer Dowsing Offshore Wind, 2022) was received from Natural England on the 23rd of September 2022. Additional consultation was undertaken on the draft Report to Inform Appropriate Assessment (RIAA), some of which relates to screening, which have been captured here. The Project's responses to these comments are presented within Table 1.1.



Table 1.1 Comments received from Natural England

Comment	Project Response
Comments on the draft screening report (including the relevant section of the draft screening report)	
<p><b>Section 3.2, Paragraph 3.2.3</b> Please see Natural England’s ‘Best Practice Guidance’ in relation to the age of supporting data and the weighting that can therefore be given to older data. In addition, we highlight that more regional broadscale data sets may not be sufficient to help characterise the Inner Dowsing, Race Bank and North Ridge (IDRBNR) Special Area of Conservation (SAC) features to inform scale and significance of impacts and inform mitigation measures.</p>	<p>The data sources used within this report have been updated to align with the relevant Environmental Statement (ES) chapters.</p>
<p><b>Section 3.2, Paragraph 3.2.4</b> Natural England advises that mixed sediment associated with Annex I sandbank troughs and Annex I Reefs is likely to be present based on information from Triton Knoll, Viking Link and the Hornsea Projects.</p>	<p>Noted – the baseline has been updated to reflect this.</p>
<p><b>Section 3.2, Paragraph 3.3.1</b> We note that the data sources differ noticeably between ODOW HRA screening report and ODOW Environmental Impact Assessment (EIA) scoping report, with latter having a more comprehensive list of data sources. We would expect that similarly comprehensive database is used to inform HRA. Please note, the most up to date references for SCAN III are Hammond <i>et al.</i>, (2021) and Lacey <i>et al.</i>, (2022). Also, Carter <i>et al.</i>, (2022) should be used, as it is the peer-reviewed and slightly amended version of Carter <i>et al.</i> (2020).</p>	<p>The data sources used within this report have been updated to align with the relevant ES chapters.</p>
<p><b>Section 3.3, Paragraph 3.3.2</b> Site-specific geophysical survey should be included in the list of Site Specific Surveys considering that marine mammal data were collected during acoustic and visual monitoring, especially as there is a mention of this survey in the Baseline section 3.3.3.</p>	<p>Site-specific geophysical surveys have been included within the baseline section.</p>

Comment	Project Response
<p><b><u>Section 3.3, Paragraph 3.3.3</u></b>            We note that two references (i.e., Small Cetaceans in European Atlantic waters and the North Sea (SCANS) III (Hammond <i>et al.</i>, 2017) and Dudgeon and Sheringham Shoal Offshore Windfarm Extensions Preliminary Environmental Impact Report (Equinor, 2021)) were used to draw a list of marine mammal species likely to be in the Project Area. We suggest that the entire list of sources to inform baseline should be consulted with to draw such conclusion.</p>	<p>All data sources were used in drafting the baseline, in line with the relevant ES chapter.</p>
<p><b><u>Section 3.4, Paragraph 3.4.1 and Paragraph 3.4.2</u></b>            Natural England note that the description of data sources to be used for offshore and intertidal ornithology is not as detailed as that provided in the Scoping Report. (123-ODO- CON-K-RA-000002-01).</p>	<p>All data sources used have been updated since PEIR in line with the Scoping Opinion and Section 42 feedback.</p>
<p><b><u>Section 3.4, Paragraph 3.4.5 and 3.4.6</u></b>            Until further project specific evidence including analysis is presented to support the HRA screening we are unable to provide further advice on the HRA screening and Ornithology baseline.</p>	<p>The full site-specific data has been used to inform this screening exercise.</p>
<p><b><u>Section 3.4, Paragraph 3.4.5 and 3.4.6</u></b>            Natural England note that only 12 months of raw data from the Digital Aerial Surveys (DAS) (out of 24) have been considered in this report, with density and population estimates available for only six months. As it is not clear to Natural England which six months density and population estimates are available for, we are unable to advise in more detail at this time.</p>	<p>Densities and population estimates using 24 months data have been used for all ornithology assessments within the ES.</p>
<p><b><u>Section 3.6, Paragraph 3.6.2</u></b>  <i>'Site specific surveys for the purpose of the project are yet to commence but are planned from Q3 2022 onwards. This information will be used to inform later stages of the assessment.'</i>            As per above our previous comments (29th July 2022):            The concern would be the PEIR being submitted in Q1 before the full suite of surveys have been completed. The full impacts cannot be</p>	<p>Winter bird surveys were completed between September 2022 and March 2023, and breeding bird surveys were undertaken between April and July 2023 (noting all breeding features were screened in). The full suite of surveys are documented within the ES.</p>

Comment	Project Response
<p>assessed, and therefore correctly mitigated for, without the full survey results.</p>	
<p><b><u>Section 4.2, Paragraph 4.2.1 and 5.2.2</u></b>            As noted elsewhere in the document disruption to sediment transport around Silver Pit can have detrimental consequences to the sediment feed for the Wash and North Norfolk Coast SAC and this should be considered in the HRA Screening.</p>	<p>The Wash and North Norfolk Coast SAC has been screened in for impacts arising from changes in suspended sediment concentrations (SSC) and deposition within Section 5.2 and are included within the RIAA.</p>
<p><b><u>Section 4.3, Table 4.3.1</u></b>            Natural England advises to include Northeast England Management Unit (MU) for grey seals due to the connectivity. As such, we suggest considering inclusion of the Berwickshire and North Northumberland Coast SAC in the list of designated sites.</p>	<p>This is noted and the Northeast England MU has been included, therefore screening in the Berwickshire and North Northumberland Coast SAC (see Section 5.3).</p>
<p><b><u>Section 4.3, Paragraph 4.3.2</u></b>            There is a reported southward expansion of bottlenose dolphins from the Moray Firth SAC thus the application should examine the available evidence in order to investigate if there is a connectivity with the proposed project area.</p>	<p>This is noted, and the Moray Firth SAC is screened in for potential LSE based on potential connectivity between the Project and the site (see Section 5.3).</p>
<p><b><u>Section 4.4, Table 4.4.1</u></b>            Natural England note a lack of clarity in the text and in Table 4.4.1 as regards screening distance criteria for breeding seabird features outside of the breeding season.            Natural England require further detail and greater clarity about the screening process as applied to seabird features outside of the breeding season.            Distant Special Protection Areas (SPAs) screened in should not be limited to those determined solely by the breeding season/foraging ranges of their ornithological features, but also account for the potential for the project to interact with birds from much more distant SPAs during the migration and non-breeding seasons.</p>	<p>The majority of features of sites with breeding season connectivity have also been screened in for the non-breeding season. Further details are provided in Section 5.4.</p>

Comment	Project Response
<p>Furness (2015) provides information for many species of seabird on the suite of colonies that may have connectivity with the southern North Sea outside the breeding season.</p>	
<p><b><u>Section 4.4, Table 4.4.1</u></b>            Natural England note a lack of clarity in the text and in Table 4.4.1 as regards screening distance criteria for non- breeding and migratory waterbird features.            Natural England require further detail and greater clarity about the screening process as applied to non-breeding and migratory waterbird features. Natural England recommend that migratory waterbird features be screened in for SPAs that are within 100 km of the project area.</p>	<p>All migratory qualifying features of SPA’s within 100km of the Project array have been screened into the assessment.            As recommended by Natural England, migratory features of SPAs beyond 100 km have been screened out because there is no LSE for these sites once impacts have been apportioned to all closer SPAs.</p>
<p><b><u>Section 4.6, Paragraph 4.6.2</u></b>  <i>‘Impacts occurring within the onshore AoS are not likely to be perceptible at designated sites beyond 15 km however the possibility cannot be fully excluded and sites beyond this distance may need to be screened in if potential impacts and potential additional pathways are identified at later stages of the assessment. For example, it may be necessary to consider designated sites beyond this distance that are close to routes being used by construction traffic, once these routes become known, or which are used by migratory birds which also use sites within the onshore AoS.’</i>            Natural England welcomes the consideration of extending the survey area if potential additional pathways are identified at a later stage. It should be noted that the scoping area should be based on the potential for species to be present within the area, the Impact Risk Zone (IRZ) for designated sites as available on Magic, the ecology, i.e., foraging areas of designated species of sites in proximity to the proposed development area. Fragmentation and disruption to habitats should also be considered and assessed.</p>	<p>Consideration has been given to designated sites located beyond 15 km from the Order Limits where a pathway has been identified, for example inclusion of pink-footed geese from the North Norfolk SPA based on evidence provided by Natural England.</p>

Comment	Project Response
<p>As previously commented (29th July 2022), if it cannot be determined that areas are not functionally linked to a designated sites for passage and over wintering Annex I birds then surveys should be carried out.</p>	
<p><b><u>Section 5.2, Table 5.2.2</u></b>            Natural England is concerned that impact pathways may be missed.</p>	<p>The scoping response has been referred to however the arguments made for scoping out effects within the EIA are different to those applied within this HRA Screening which are primarily based around distances. All impact pathways have been considered within screening (see section 4.4 for the methodology).</p>
<p><b><u>Section 5.3, Table 5.3.2</u></b>            We note the omission of the ‘habitat loss’ as potential effect in the row relevant to Southern North Sea SAC. We would welcome clarification whether this potential effect is screened in or out of the assessment.</p>	<p>This is noted and habitat loss has been screened in for the Southern North Sea SAC (see Section 3.3).</p>
<p><b><u>Section 5.3, Table 5.3.2</u></b>            We would welcome further evidence for screening out potential effects for two seal SACs (i.e., Humber Estuary SAC and The Wash and North Norfolk Coast SAC). We do not agree that at this stage ‘changes to prey’ and ‘disturbance at haul out’ can be screen out. Changes to prey is linked to the fish and shellfish assessment which is not yet available while ‘disturbance at haul out sites’ cannot be screened out until more information is known about port use and vessel traffic/movement.</p>	<p>With respect to the ‘changes to prey’ effect on a precautionary basis this has been screened in for further assessment (see Section 5.3).            With respect to the ‘disturbance at haul out’ effect, given the likelihood of the Humber estuary ports being utilised for both construction and O&amp;M phase works, the Humber Estuary SAC has been screened in for this effect. However, these ports are distanced enough from the Wash and North Norfolk Coast SAC, with no realistic prospect of being in proximity to vessel traffic routes that it is considered there is no potential for an LSE and the effect has been screened out (see Section 5.3).</p>
<p><b><u>Section 5.3, Table 5.3.2</u></b>            It is our understanding that the applicant used 26km Effective Deterrent Ranges (EDR) for monopiles as a maximum range considered relevant for all pathways for the transboundary sites for the harbour porpoise. We agree that LSE for majority of pathways is likely to be within this radius,</p>	<p>Noted. A Transboundary Screening assessment has been undertaken by The Planning Inspectorate, with no concerns raised by the parties consulted through that process.</p>

Comment	Project Response
<p>however we advise that the relevant authorities for transboundary sites are consulted to confirm this approach.</p>	
<p><b>Section 5.4, Paragraph 5.4.1</b>            The text states that the screening process “considers the waterbird features of designated sites with direct overlap with the Project or where there is potential for migratory waterbird collision risk impact using migratory pathways provided in Wright <i>et al.</i> (2012).”</p> <p>However, Natural England note that in Table 5.4.2, migratory waterbird features are excluded from consideration for all SPAs, based on the statement “migrations of birds from this SPA are likely to result in negligible numbers passing through the site.” Natural England note that the migratory pathways of many of these species as shown in Wright <i>et al</i> (2012) overlap with the project area. Natural England also note that Wright <i>et al</i> (2012) state: “Although the migratory destinations on land are quite well understood for many species, details of the routes that they follow when flying over the sea around the UK are rarely known. This means it is difficult to estimate the numbers of birds likely to fly over proposed offshore windfarm sites, particularly for species that use more than one migratory pathway across UK waters”.</p> <p>For these reasons, Natural England believe a more precautionary approach should be taken with regards to screening in assessment of impacts on migratory waterbird features of SPAs.</p>	<p>As recommended by Natural England, all migratory qualifying features of SPAs within 100 km of the Project array have been screened into the assessment.</p> <p>Migratory features of SPAs beyond 100 km have been screened out because there is no LSE for these sites once impacts have been apportioned to all closer SPAs.</p>
<p><b>Section 5.4, Table 5.4.1</b>            Natural England note that “Direct disturbance and displacement due to the presence of turbines” is not included in this table for consideration of impacts during construction. Natural England note this was included for consideration of impacts in the EIA Scoping Report (Table 7.6.5) under “Disturbance and displacement: array: construction”. Natural</p>	<p>Disturbance and displacement in the array during construction was included at PEIR and is included within the assessment at RIAA.</p>

Comment	Project Response
<p>England recommend that displacement impacts of the array be considered during construction.</p>	
<p><b>Section 5.4, Table 5.4.2</b>            Natural England note that it is not clear in Table 5.4.2 how or whether impacts are considered on breeding seabird features outside the breeding season. Natural England recommend that impacts on breeding seabird features outside the breeding season be considered and that details of how they are considered be clearly presented.</p>	<p>All features of sites with breeding season connectivity have also been screened in for the non-breeding season.</p>
<p><b>Section 5.4, Table 5.4.2</b>            Natural England note that in Table 5.4.2, migratory waterbird features are excluded from consideration for all SPAs, based on the statement: “migrations of birds from this SPA are likely to result in negligible numbers passing through the site.”            Natural England note that the migratory pathways of many of these species as shown in Wright <i>et al</i> (2012) overlap with the project area. Natural England also note that Wright <i>et al</i> (2012) state: “Although the migratory destinations on land are quite well understood for many species, details of the routes that they follow when flying over the sea around the UK are rarely known. This means it is difficult to estimate the numbers of birds likely to fly over proposed offshore windfarm sites, particularly for species that use more than one migratory pathway across UK waters”.            For these reasons, Natural England believe a more precautionary approach should be taken with regards to screening in assessment of impacts on migratory waterbird features of SPAs.</p>	<p>As recommended by Natural England, all migratory qualifying features of SPAs within 100 km of the Project array have been screened into the assessment.            Migratory features of SPAs beyond 100 km have been screened out because there is no LSE for these sites once impacts have been apportioned to all closer SPAs.</p>

Comment	Project Response
<p><b><u>Section 5.4, Table 5.4.2</u></b>            Natural England note that all reference to displacement impacts in this table is described as: “Direct disturbance and displacement due to work activity and vessel movements in both the offshore and intertidal zones”. Natural England note that it is not clear from this statement whether impacts of displacement due to the actual presence of the array have been considered in this table.</p>	<p>Displacement impacts due to the presence of the array have been considered.</p>
<p><b><u>Section 5.4, Table 5.4.2</u></b>            Natural England note that the project array is within mean- maximum +1SD foraging range for sandwich tern and common tern (contrary to what is stated in the table).            However, Natural England recognise that this is a marine SPA and the breeding sites for these species are not contained within the Greater Wash SPA. However, the sandwich tern foraging within the Greater Wash SPA are likely to be breeding at the North Norfolk Coast SPA (see comment below), which is within mean-maximum +1SD foraging range for this species. Impacts on sandwich tern breeding at the North Norfolk Coast SPA could also have impacts on site integrity of the Greater Wash SPA. Natural England also note that little gull have been screened out for this SPA.</p>	<p>Collision impacts on Sandwich tern and migratory collision impacts on little gull have been considered. Impacts to the Greater Wash SPA and North Norfolk Coast SPA conservation objectives are considered.</p>
<p><b><u>Section 5.4, Table 5.4.2</u></b>            Natural England notes that the table does not explicitly state which features are being screened in for collision impacts for the Flamborough and Filey Coast SPA.</p>	<p>This has now been clarified within the table.</p>
<p><b><u>Section 5.4, Table 5.4.2</u></b>            Natural England note that the project array is within mean- maximum +1SD foraging range for lesser black-backed gull, contrary to what is stated in the table, and contrary to the criteria outlined by the applicant in Table 4.4.1.</p>	<p>Screened in on advice from Natural England. Text amended noting connectivity.</p>



Comment	Project Response
<p><b><u>Section 5.4, Table 5.4.2</u></b>            Natural England note that impacts on breeding seabird features outside the breeding season have not been considered.</p>	<p>Text amended to clarify that impacts on breeding seabirds outside the breeding season have been considered.</p>
<p><b><u>Section 5.4, Table 5.4.2</u></b>            Regarding the following sites listed below, Natural England welcomes the precautionary inclusion of all features.            Humber Estuary SPA            The Wash SPA            The Greater Wash SPA            Gibraltar Point SPA</p>	<p>Noted.</p>
<p><b><u>Section 5.6, Table 5.6.1</u></b>            Risk of pollution to affect habitat quality at the construction and decommissioning stages and for consideration of LSE have not been included for Saltfleetby-Theddlethorpe Dunes &amp; Gibraltar Point SAC.</p>	<p>Noted, this has been considered within the RIAA.</p>
<p><b><u>Section 5.6, Table 5.6.1 and 5.6.2</u></b>            In Table 5.6.1, ‘loss of or decline in populations of scarce invertebrates and plants’ have not been included Gibraltar Point Ramsar but are included in Table 5.6.2.            ‘Loss of or decline in populations of scarce invertebrates and plants’ is included in the effects considered during construction for Gibraltar Point Ramsar site in Table 5.6.2 but is not included in the LSE consideration.</p>	<p>Noted, this has been considered within the RIAA.</p>
<p><b><u>Section 5.6, Table 5.6.2</u></b>            ‘Risk of loss of or damage to Annex I habitats depending on location of the above ground infrastructure’ has been considered for Saltfleetby-Theddlethorpe Dunes &amp; Gibraltar Point SAC in Table 5.6.1 but Table 5.6.2 does not include loss or damage to habitats for the construction and decommissioning stages but is considered as LSE.</p>	<p>Noted, this is considered within the RIAA.</p>

Comment	Project Response
<p><b><u>Section 5.6, Table 5.6.2</u></b> Pollution from site run-off affecting habitat quality has not been included for Saltfleetby-Theddlethorpe Dunes &amp; Gibraltar Point SAC.</p>	<p>Noted, this has been considered within the RIAA.</p>
<p><b><u>Section 6.1, Paragraph 6.1.1</u></b> Natural England welcomes further consideration of in-combination impacts. We would value confirmation by the applicant that the Southern North Sea SAC will be included in the in-combination assessment and clarification on which sites and pathways are screened in the in-combination assessment for seals.</p>	<p>The standard text for in-combination screening for the sites screened in for LSE alone has been updated to clarify that those sites screened in for the project alone are also screened in, in-combination (see Section 6). Detail on the sites screened in for seal is provided within Table 5.4. The receptors at the site have not been repeated in this table as they are outlined elsewhere.</p>
<p><b><u>Section 6.1, Paragraph 6.1.4</u></b> The text states: “It is proposed that projects that are built and operational at the time the site was designated have been classified as part of the baseline conditions.” Natural England request clarity on this statement and note that Natural England does not consider projects to be ‘part of the baseline’ in terms of in-combination effects unless the data under-pinning the assessment were collected subsequent to the construction or operation of projects.</p>	<p>It is considered that any projects that were constructed and operational at the time a site was designated, will have been considered within the condition assessment and designation of the site and therefore if they are considered again within this screening report the effects will have been double counted. Additionally, any projects that concluded any works resulting in potential impacts prior to the collection of baseline data have also been considered as part of the baseline and are therefore not considered in-combination.</p>
<p><b><u>Section 6.1, Table 6.1.1</u></b> See comments relating to screening of impacts for the project alone.</p>	<p>Please see responses to comments relating to screening of impacts for the project alone.</p>
<p><b><u>Section 6.1, Paragraph 6.1.9</u></b> Natural England note that the final long list of plans and projects to be considered for in-combination impacts is not yet available and Natural England cannot therefore comment on this list at this time.</p>	<p>Noted.</p>
<p><b><u>Section 7.3, Table 7.3.1</u></b> Natural England note that all reference to displacement impacts in this table is described as: “Direct disturbance and displacement due to work activity and vessel movements in both the offshore and intertidal zones”.</p>	<p>Text has been amended to make it clear that displacement due to the presence of the array is considered.</p>

Comment	Project Response
<p>However, it is not clear from this statement whether impacts of displacement due to the actual presence of the array have been considered in this table.</p>	
<p><b>Section 7.3, Table 7.3.1</b> Natural England note that no reference is made to collision risk impacts in this table.</p>	<p>Text has been amended so make it clear that collisions have been considered.</p>
<p><b>Section 7.5, Table 7.5.1</b> Pollution from site run-off affecting habitat quality has not been included in the construction stage or in the consideration of LSE alone for Saltfleetby-Theddlethorpe Dunes &amp; Gibraltar Point SAC.</p>	<p>Noted. This has been considered within the RIAA.</p>
<p><b>Comments on the draft RIAA relating to screening</b></p>	
<p>Berwickshire and North Northumberland Coast SAC has only been screened in for vessel presence disturbance for the in-combination assessment, and not for any other impact or for the project alone assessment. Insufficient justification has been provided as to why certain impact pathways have been screened out for this site. Natural England advise that this SAC for Grey seals should be fully considered in the assessment.</p> <p>Additionally, as the inshore bottlenose dolphin associated with the Moray Firth SAC are being considered in the assessment (see previous comments), we recommend that the Moray Firth SAC should also be screened into the HRA. Whilst the authority for the provision of advice on SACs located within Scotland is with NatureScot, populations of bottlenose dolphin associated with this Marine Protected Area (MPA) have been recorded frequently in English waters.</p> <p>The submitted RIAA should provide justification for screening out other impact pathways for the Berwickshire and North Northumberland Coast SAC Grey seal feature.</p> <p>Screen in the bottlenose dolphin populations of the Moray Firth SAC for LSE (Likely Significant Effect).</p>	<p>Noted. The Berwickshire and North Northumberland Coast SAC was screened in for several effects alone and in-combination as per Table 5.4. Several in-combination effects were screened through to the RIAA were subsequently determined to have no potential for an in-combination LSE within the RIAA due to the refinements made to the Project design and the more detailed information available for the Project at that stage and therefore not assessed at that stage. This justification is provided in Table 10.2 of the final RIAA, and those effects that are considered in-combination are subsequently assessed.</p> <p>The Moray Firth SAC has been screened in for underwater noise, vessel disturbance and collision risk. These are subsequently assessed within the RIAA.</p>

Comment	Project Response
<p>Changes to prey have only been screened in for Harbour Porpoise and the SNS SAC and not for any other sites/features in the project alone assessment. There should be consideration of how changes to prey could impact seals foraging at sea outside of their SAC boundary.</p> <p>Screen in relevant seal SACs into the submitted RIAA or provide justification as to why 'Changes to Prey' has been screened out for Grey and Harbour seal SACs.</p>	<p>Noted. Changes to prey have been screened in for additional sites which are assessed within the RIAA.</p>
<p>Insufficient justification has been presented as to why for the O&amp;M stage of the project alone assessment, seals have been screened out for underwater noise impacts.</p> <p>Screen in or provide justification for screening out in the submitted RIAA.</p>	<p>Seal tracking studies (e.g. Tougaard <i>et al.</i>, 2003 and Russell <i>et al.</i>, 2016) show that there is no adverse effect from operational windfarms and may result in increased usage compared to pre-construction (Russell <i>et al.</i>, 2016). Therefore, it is considered that there is no effect of operational noise on seals and this effect has been screened out.</p>

## 1.4 Project Overview

### 1.4.1 Offshore

6. This section summaries the key information regarding the design and development of the Project. For full details on all aspects of the Project, please see Volume 1, Chapter 3: Project Description (document reference 6.1.3).
7. The Project's array area covers an area of seabed of approximately 435.75km<sup>2</sup> and lies approximately 54 km east of the Lincolnshire coast at its closest point. Water depths vary across the array area between approximately -5.6m to -48.1m relative to Lowest Astronomical Tide (LAT).
8. A proposed maximum number of 100 Wind Turbine Generators (WTGs) will be installed within the array area. The physical parameters of these WTGs are presented in Table 1.2. While the maximum number and parameters of WTGs is known at this time, the final layout of the WTGs is yet to be determined.

Table 1.2 WTG Maximum Design Scenario

Parameters	Project Design Envelope
Maximum number of WTGs	100
Indicative number of WTGs assuming maximum rotor diameter	50
Maximum blade tip height above LAT (m)	403
Maximum rotor diameter	340

9. The factors influencing the choice of foundation for the Project includes: the type of wind turbine to be used, the nature of the ground conditions on the site, the water depth and sea conditions (i.e. prevailing wave and current climate), as well as supply chain constraints and overall cost. The foundation type selected in the final design for the offshore structures (WTGs, OSS, accommodation platform, ORCPs and ANSs) will be dependent on the final site investigations and turbine procurement (both undertaken post consent). Therefore, given the uncertainty over this aspect of the design, a range of foundation types have been considered in this Screening Report. The types of foundations currently being considered for the Project are monopiles, suction bucket monopiles, gravity base structures (GBS), pin-piled jackets, suction bucket jackets, and gravity base jackets.
10. Scour protection will be put in place around the foundations (where relevant), with several methods being considered, including rock or gravel placement, concrete mattresses, flow energy dissipation devices, protective aprons, or coverings (solid structures of varying shapes, typically prefabricated in concrete or high-density plastics), ecological based solutions, and bagged solutions.

11. OSS hosting electrical systems will collect the power generated by the WTGs (via the inter-array cables) and export it (through the export cable) to shore. These platforms would be intended to step-up and stabilise the voltage of power generated offshore and reduce the potential electrical losses. Additionally, at this stage the Project is also considering the possibility of using both an accommodation platform to facilitate the operation of the windfarm (positioned within the array area), and up to two High Voltage Alternating Current (HVAC) ORCP (positioned within the offshore export cable corridor).
12. Electricity generated will be transported from the array to the coastline via the offshore export cables. Several installation (burial) methodologies for cables are being considered including: jet trenching, pre-cut and post-lay ploughing or simultaneous lay and plough, mechanical trenching (such as chain cutting), dredging (typically trailing suction hopper dredging and backhoe dredging or water injection dredging), mass flow excavation, rock cutting, burial sledge, sandwave and boulder clearance, jet sledding (hybrid of jet trencher and cable plough), and vertical injector burial (for very deep burial). At the landfall, the cables will be installed using a trenchless technique to avoid impacting the intertidal or the sea defence.
13. All offshore cables will be buried where possible. Where it is not reasonably feasible to bury cables, it may be necessary to install cable protection to prevent scour, minimise the risk of damage to the cable and protect other sea users. The assessment will consider the use of cable protection to be laid anywhere within the offshore Order Limits, i.e. within the array and export cable corridor (ECC) areas. An analysis of the requirement for the cables to cross existing or proposed infrastructure (such as subsea cables and pipelines) has been provided within the ES along with realistic worst case design parameters which enables a detailed assessment to be undertaken. Additionally, up to six platform link cables will also be required between the OSS, which could have the same characteristics as either the export cables or inter-array cables.
14. The Project also includes for the delivery of ANSs and biogenic reef creation if these are deemed necessary by the Secretary of State (SoS) as compensation for impacts arising from the development. The Project has provided for the delivery of up to two ANSs, within the ANS areas, situated to the north-west and south-east of the array area. Depending on agreement with relevant stakeholders, the ANSs could be either co-located within a single area or one ANS positioned within each area. The area for the biogenic reef creation overlaps with the Inner Dowsing, Race Bank and North Ridge SAC, inshore of the array area. Final locations of the ANSs and biogenic reef areas would be determined post-consent, in consultation with Natural England and other relevant stakeholders, and would be subject to final approval by the SoS.

#### 1.4.2 Onshore

15. Cables will be delivered in sections and buried in trenches, with the ground surface subsequently re-instated to its pre-existing condition as far as reasonably practical. Cables sections will be connected within jointing bays.
16. The cables shall follow the prescribed route onshore.

17. The indicative key parameters for the onshore export cables are presented in Volume 1, Chapter 3: Project Description (document reference 6.1.3). Cable installation techniques are well-established and incorporate environmental management and mitigation measures as standard practice. Precise installation methods will differ according to the nature of the environment through which the cable is being installed. The Project has committed to Horizontal Directional Drilling (HDD) at landfall.
18. During construction of the cable trenches the topsoil and subsoil will be stripped and stored on site within the temporary working corridor of the project onshore cable corridor. The procedures followed will be in line with best practice and agreed through the Code of Construction Practice or an appropriate management plan.
19. Jointing bays (an underground concrete structure holding the joint between sections of the onshore export cables) will be required. The detailed design of these components will be defined post-consent (if granted).
20. Details of the proposed cable corridor (including access corridors), jointing bays and installation methods (and parameters) has been included within the ES.
21. The Project will require the construction of project specific onshore electrical infrastructure facilities. These facilities may include:
  - One onshore substation containing the electrical components for transforming the power supplied from the windfarm to 400 kV and to adjust the power quality and power factor, as required to meet the United Kingdom (UK) System-Operator Transmission-Owner Code (STC) for supply to the National Grid.
22. Grading, earthworks and drainage will be undertaken initially within the onshore electrical infrastructure facilities footprint. Foundations will then be installed which will either be ground-bearing or piled, based on the prevailing ground conditions.
23. The proposed building substructures will be predominantly composed of steel and cladding materials although brick/ block-built structures are sometimes employed. The structural steelwork is likely to be fabricated and prepared off site and delivered to site for construction. The steelwork may be erected with the use of cranes. Cladding panels (typically composite) may be delivered to site ready to erect and be fixed to the steelwork. In addition, there could be unshoused equipment, such as compensation transformers and water tanks. Lightning masts may be constructed to an approximate height of 30 m.
24. A key aspect of substation(s) installation will be the delivery of the transformers and shunt reactors. Due to their size and weight, these items will be classified as Abnormal Indivisible Loads (AILs) and delivered via specialist means and offloaded with the use of cranes, Self-Propelled Modular Transporters (SPMTs) or skids. The majority of the remaining equipment is anticipated to be erected with the use of small mobile plant and lifting apparatus.
25. The onshore electrical infrastructure facilities will be required throughout the lifetime of the project. Their key parameters are presented in Volume 1, Chapter 3: Project Description (document reference 6.1.3).

26. Average vehicle movements will be provided to inform the ES assessments for the construction phase of the onshore works, including movements of abnormal loads, Heavy Goods Vehicles (HGVs) movements and movements of Light Goods Vehicles (LGVs) and cars associated with the construction activities.

#### 1.4.3 Artificial Nesting Structures

27. The project may construct a maximum of up to two ANS offshore to provide a nesting location for certain bird species. This is an ecological compensation measure for potential impacts from the Project to the kittiwake feature of the Flamborough and Filey Coast (FFC) Special Area of Protection (SPA) identified as necessary by The Crown Estate (TCE) Plan Level Habitats Regulation Assessment (HRA) for Offshore Wind Leasing Round 4. If required by the Secretary of State, the platform may also be designed to accommodate other species for the purpose of compensation. Further details are presented within Volume 1, Chapter 3: Project Description (document reference 6.1.3).

28. The ANS would be comprised of a topside nesting structure and will be supported by a foundation structure such as a monopile or jacket. The installation of such foundations will be undertaken in a similar manner to other offshore structures as described in Volume 1, Chapter 3: Project Description (document reference 6.1.3).

#### 1.4.4 Offshore Reactive Compensation Platform

29. Long distance, large capacity HVAC transmission systems can require reactive compensation equipment to reduce the reactive power generated by the capacitance of the offshore export cable to maximise the amount of power delivered to the National Grid transmission system. The electrical equipment required, primarily shunt reactors and HV switchgear will be in the form of HVAC ORCPs. The maximum number of ORCPs would be two.

30. The ORCPs would be located in the Project offshore ECC, rather than in the Project array area. For the purposes of the ES assessments, an ORCP area of approximately 15 km<sup>2</sup>, approximately 12 km from the shore, along the Project cable corridor has been identified. This area has been chosen based on primarily electrical design studies, while aiming to minimise environmental impact and avoiding the Inner Dowsing, Race Bank and North Ridge SAC.

31. The final position of the ORCPs will be defined post-consent in the detailed design stage. The siting will consider factors including final electrical design, water depth, ground conditions, marine traffic, proximity to shore, other existing/ planned offshore infrastructure and other engineering and economic considerations.

32. The external design of the ORCPs will be structurally similar to the OSS. These will comprise a platform with one or more decks, including means to facilitate helicopter access. They will contain equipment required to provide reactive power compensation and housing auxiliary equipment and facilities for operating, maintaining, controlling the ORCPs and to access the ORCPs by vessels and helicopters.



#### 1.4.5 Biogenic promoting infrastructure

33. Technology may be developed by the time of construction so that remedial protection measures are available that may promote increased biodiversity through creation of suitable habitat (e.g., artificial reefs). The use of such measures will be considered post consent on an area-by-area basis (e.g. in areas considered most sensitive to cable protection measures where agreed with stakeholders). The use of such measures may be in conjunction with other remedial protection measures.

## 2 The HRA Process

### 2.1 Legislative Context

#### 2.1.1 Habitats Regulations

34. A network of protected areas for specific habitats and species of importance (known as European sites) has been established by European Union (EU) member states under the Habitats and Birds Directives (Council Directive 92/43/EEC and Directive 2009/147/EC). In the UK, these are implemented through the Conservation of Habitats and Species Regulations 2017 (the Habitats Regulations (as amended)) and Offshore Marine Habitats and Species Regulations 2017 (the Offshore Habitats Regulations (as amended)), which require that an Appropriate Assessment (AA) of the implications must be made, by the relevant Competent Authority, if a project (or plan) is likely to have a significant effect on a European site either alone, or in combination with other plans or projects. The four-stage process of determining potential impacts to European sites under the Habitats Regulations is known as a Habitats Regulations Assessment (HRA).

35. The requirement to undertake HRA is provided by Section 63(1) of the Habitats Regulations that specifies that:

*"A competent authority, before deciding to undertake, or give any consent, permission or other authorisation for, a plan or project which -*

*Is likely to have a significant effect on a European Site or a European offshore marine site (either alone or in combination with other plans or projects), and*

*Is not directly connected with or necessary to the management of that site, must make an appropriate assessment of the implications of the plan or project for that site in view of that site's conservation objectives."*

36. As the Project is not directly connected with or necessary to the management of a European site, an HRA is required.

37. The EU Exit Regulations (2019) establish any EU Exit-related changes to the Habitat Regulations, with these considered to have no material implications on the requirement or process for a HRA of the Project.

#### 2.1.2 European Sites Post-EU Exit

38. The National Site Network comprises of European sites in the UK that already existed on 31 December 2020 (or proposed to the European Commission before that date) and were established under the Nature Directives (Habitats Directive, Council Directive 92/43/EEC, and the Wild Birds Directive, Directive 2009/147/EC), alongside any sites subsequently designated under the Habitats Regulations (2017) or Offshore Habitats Regulations (2017). Regulation 8 of the Habitats Regulations (2017) defines European sites as Special Areas of Conservation (SACs), Sites of Community Importance (SCI), proposed sites (candidate SACs (cSAC) and proposed SPAs (pSPA)) and Special Protection Areas (SPAs).

39. The term 'European marine site' is interchangeable with European site and refers to SACs and SPAs covered by tidal water that protect marine and coastal habitats and species. UK planning policy extended the definition to include proposed and designated Ramsar wetland sites of international importance designated under the Ramsar Convention 1971. Defra has confirmed that following Brexit, Ramsar sites remain protected in the same way as SACs and SPAs, but do not form part of the National Site Network (Defra, 2021a).

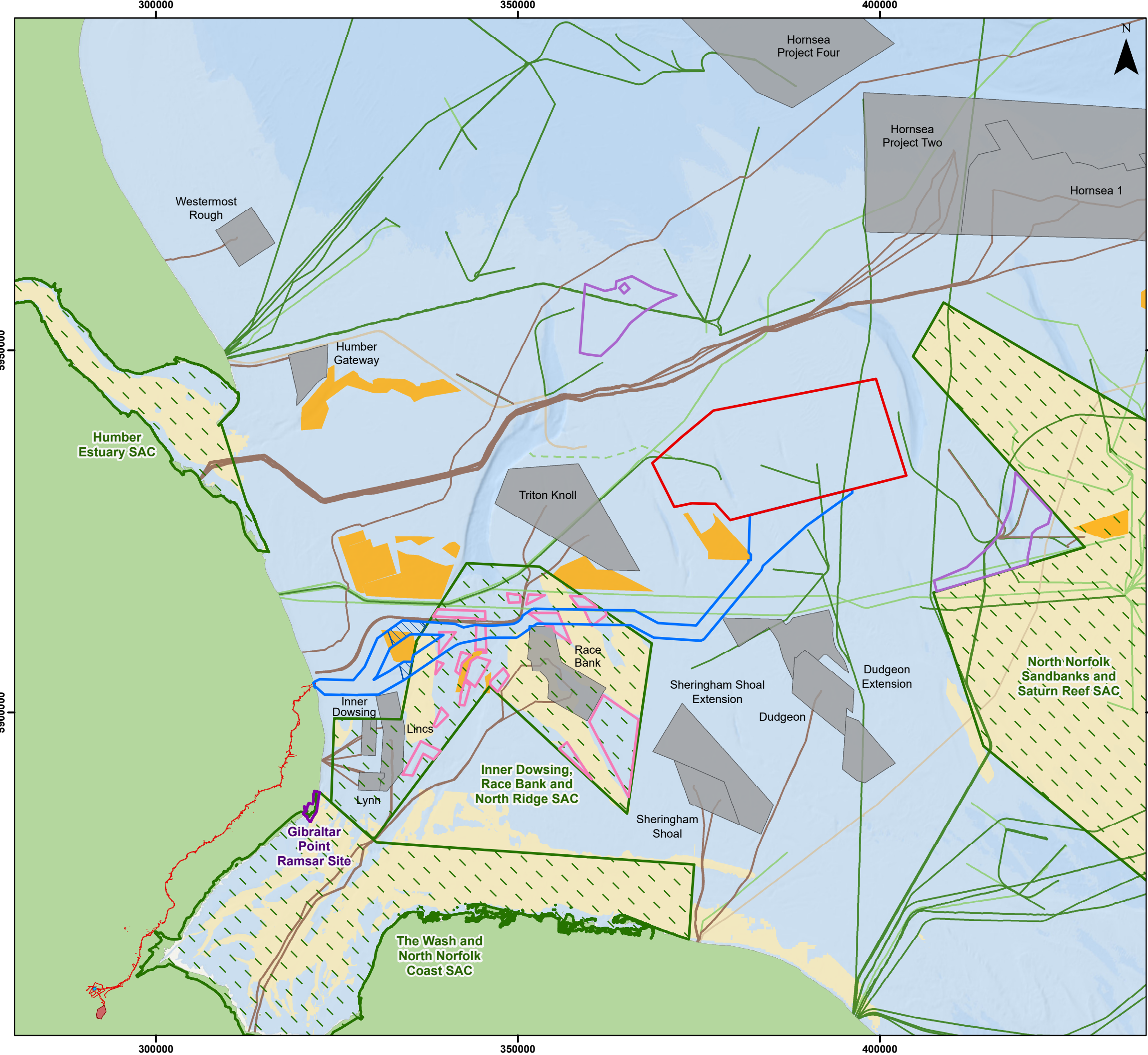
## 2.2 The HRA Process

40. The Stages covered by HRA are referenced in the Planning Inspectorate Advice Note 10. Each stage (except the last) defines the requirement for and scope of the next. An initial 'Screening' stage (Stage 1) determines the potential for a LSE. Key to the process are the terms 'likely' and 'significant', which means there is potential for an effect to occur but for it to not be considered significant (i.e. a pathway for effect does not necessarily result in a conclusion of LSE). It is possible that no LSE is determined alone but potential for LSE remains in-combination. If, on the best available information, potential for a LSE to a European site(s) cannot be discounted, then an Appropriate Assessment (AA) of the effect-pathway(s) to the site is required at HRA Stage 2, where the implications for European site integrity are considered. Importantly, as determined in the case of *People Over Wind, Peter Sweetman v Coillte Teoranta (C-323/17)* (The Court, 2018), mitigation measures cannot be considered at Stage 1, however such measures are an integral element of the assessment at Stage 2.
41. The latter stages become relevant if the AA cannot exclude an adverse effect on site integrity. These stages will be addressed in the event there is a negative outcome to the second stage (AA). The current report presents the conclusions of Stage 1 screening only. Stage 2 is presented within the RIAA (Document Reference 7.1).

## 3 Environmental Baseline

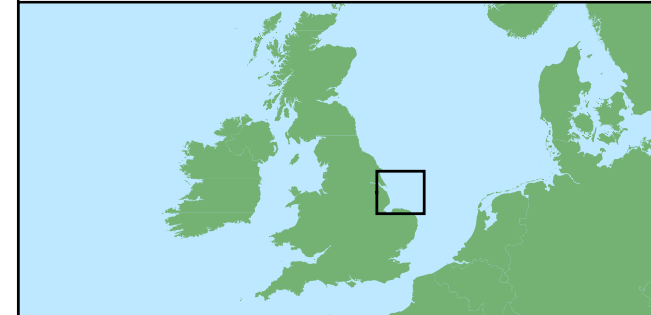
### 3.1 Introduction

42. This section provides an overview of the environmental characteristics relevant to the receptors under consideration as part of the HRA screening process, specifically:
- Subtidal and intertidal benthic ecology;
  - Marine mammals;
  - Offshore and intertidal ornithology;
  - Migratory fish; and,
  - Onshore ecology.
43. Baseline information relevant to the determination of LSE relates to the array area, the onshore and offshore cable corridor, onshore substation, and compensation areas (Figure 3.1), and the wider area across which designated sites are identified for consideration of potential LSE.
44. The information presented here draws on a wide range of data sources specific to each receptor, as outlined below. This section is intended to provide a brief summary of the existing baseline information only to inform this HRA screening exercise. A more exhaustive review of baseline data is not required for this HRA screening exercise but has been compiled to inform the subsequent stage two assessments within the RIAA, which builds on the information collated to inform the final ES. Where site specific information is available this is highlighted in the relevant section below.



### Legend

- Array Area
- Offshore Export Cable Corridor
- ORCP Area
- Artificial Nesting Structure Area
- Biogenic Reef Restoration Area
- Onshore Order Limits
- Onshore Substation
- Substation Search Area
- Offshore Wind Farm
- Aggregates Area
- Annex I Sandbanks
- Cable - Active
- Cable - Not In Use
- Pipeline - Active
- Pipeline - Not In Use
- Pipeline - Abandoned
- Ramsar Site
- Special Areas of Conservation (SAC)



Coordinate System: WGS 1984 UTM Zone 31N

0 10 20 km

Scale: 1:500,000

A3 Page Size

Environmental Statement

The Project Array Area with the Onshore and Offshore Area of Search (AoS)

Figure 3.1



Document Path: Z:\GIS\GIS - Projects\0152 Outer Dowsing EIA\GIS\Figures\ESHRA Screening\ODOW\_0152\_HRA\_Fig3\_1 Onshore Offshore AoS.mxd

## 3.2 Subtidal and intertidal benthic ecology

### 3.2.1 Existing Data Sources

45. The following regional datasets provide the existing baseline for subtidal and intertidal benthic ecology:

- British Geological Survey (BGS) Marine Sediment Particle Size dataset sourced from the BGS GeoIndex Offshore portal;
- Cefas OneBenthic Baseline Tool (OneBenthic database, 2020);
- Environmental statements or ES documents from other offshore windfarm (OWF) developments within the area (Triton Knoll, Race Bank, Dogger Bank Creyke Beck A and B, and Dudgeon and Sheringham Shoal OWFs extension projects);
- EU SeaMap 2021 Broad-Scale Predictive Habitat Map for Europe (European Marine Observation and Data Network (EMODnet), 2021);
- Hornsea Project Four OWF Benthic Ecology Technical Report (Orsted, 2022);
- Hornsea Project One Array Survey (2010 – 2011);
- Hornsea Project One Offshore Windfarm – Year 2 Post Construction Controlled Flow Excavation Monitoring Report (Orsted, 2020);
- Hornsea Project Three OWF Benthic Ecology Technical Report (Orsted, 2018);
- Hornsea Project Two array Survey (2012);
- Humber Aggregate Dredging Association (HADA) benthic grab samples in the Humber and Outer Wash Region (ERM, 2012);
- Humber Gateway datasets and studies including baseline study of marine ecology (ICES, 2005), benthic monitoring programme (PMSL, 2011; 2012; 2013);
- Humber Regional Environmental Characterisation (REC) including benthic biotope map (Tappin *et al.*, 2011);
- Information on species of conservation interest (Joint Nature Conservation Committee (JNCC), 2007);
- Lincs OWF Benthic Baseline Survey Report (EMU, 2005);
- Lincs OWF Post Construction Hydrographic, Geophysical and Benthic Survey (EGS International, 2015);
- Planning Offshore Wind Strategic Environmental Impact Decisions (POSEIDON) Project;
- Regional Seabed Monitoring Programme (RSMP) (Cooper and Barry, 2017);
- Sheringham Shoal and Dudgeon Offshore Windfarm Extension Projects including Dudgeon Extension Project (DEP) Benthic Characterisation Report (Fugro, 2020a), and Sheringham Extension Project (SEP) Benthic Characterisation Report (Fugro, 2020b);
- Triton Knoll offshore windfarm (TKOWF) site specific benthic survey data (November 2018 – January 2019);

- UK Benthos Database v5.14 1975-2015 (OGUK, undated);
- Various datasets from Lynn and Inner Dowsing offshore windfarms including pre-construction characterisation surveys (AMEC, 2002), *Sabellaria spinulosa* mapping survey (Envision, 2004), Lynn and Inner Dowsing Geophysical and Biological Survey report (EGS International Ltd, 2010), and Post-construction monitoring survey reports (EGS International, 2010; 2011; RPS, 2014);
- Various datasets from TKOWF including pre-Construction Benthic and Geophysical Baseline Report (Triton Knoll OWF Limited, 2019), and post Cable Installation Monitoring Survey 2021 (Precision Marine Survey Ltd, 2021); and,
- Westermost Rough Pre-construction environmental monitoring survey reports (Westermost Rough Ltd, 2014).

### 3.2.2 Site Specific Surveys

46. The first geophysical survey campaign commenced in August 2021 and was completed in January 2022. This survey covered the Project array area with a buffer, and also collected some data from the 'Silver Pit' area to inform export cable routeing considerations. Additional geophysical, geotechnical, and benthic ecology site specific surveys of the Project array area and offshore ECC were carried out in 2022 and have been used to inform this screening report, the RIAA, and the ES as appropriate.

### 3.2.3 Baseline

47. As identified by EUSeaMap 2021, the habitats found within the Project site include:

- A5.14 Circalittoral coarse sediment;
- A5.15 Deep circalittoral coarse sediment;
- A.23 or A.24 Infralittoral fine sand or Infralittoral muddy sand;
- A5.25 or A5.26 Circalittoral fine sand or Circalittoral muddy sand; and,
- A5.27 Deep circalittoral sand.

48. Sublittoral mixed sediment is also considered likely to be present within the study area due to the proximity of the project to Hornsea Offshore Wind Project Three, which identified this sediment type in the region.

49. Due to the proximity to the Project, the biotypes identified by TKOWF have also been considered as a part of the baseline. The biotypes identified include:

- MD52 Atlantic offshore circalittoral sand;
- MC52 Atlantic circalittoral sand;
- MB52 Atlantic infralittoral sand;
- MC42 Atlantic circalittoral mixed sediment;
- MD32 Atlantic offshore circalittoral coarse sediment;
- MC32 Atlantic circalittoral coarse sediment;

- MB32 Infralittoral coarse sediment;
- MC3211 *Spirobranchus triqueter* with barnacles and bryozoan crusts on unstable circalittoral cobbles and pebbles (Impoverished);
- MB5231 Infralittoral mobile clean sand with sparse fauna (Impoverished);
- MC4214 *Flustra foliacea* and *Hydrallmania falcata* on tide-swept circalittoral mixed sediment (Intermediate); and,
- MC2211 *S. spinulosa* on stable circalittoral mixed sediment.

50. The primary benthic habitats and species of relevance to this HRA include sandbanks, reefs and *S. spinulosa* as identified within Table 5.2. The designated sites within the study area include the North Norfolk Sandbanks and Saturn Reef SAC, Inner Dowsing Sandbanks and Saturn Reef SAC, Wash and North Norfolk Coast SAC, Humber Estuary Ramsar, Humber Estuary SAC, Gibraltar Point Ramsar and The Wash Ramsar.

### 3.3 Marine Mammals

#### 3.3.1 Existing Data Sources

51. The following regional datasets provide the existing baseline for marine mammals:

- Atlas of Cetacean Distribution in North-west European Waters 'Joint Cetacean Database' (Reid *et al.*, 2003);
- Carter, M., Boehme, L., Cronin, M., Duck, C., Grecian, W., Hastie, G., Jessopp, M., Matthiopoulos, J., McConnell, B., Miller, D., Morris, C., Moss, S., Thompson, D., Thompson, P. and Russell, D. (2022). 'Sympatric Seals, Satellite Tracking and Protected Areas: Habitat-Based Distribution Estimates for Conservation and Management', *Frontiers in Marine Science*, 9/875869: 1-18;
- Carter, M., L. Boehme, C. Duck, W. Grecian, G. Hastie, B. McConnell, D. Miller, C. Morris, S. Moss, D. Thompson, P. Thompson, and D. Russell. 2020. Habitat-based predictions of at-sea distribution for grey and harbour seals in the British Isles. Sea Mammal Research Unit (SMRU), University of St Andrews, Report to BEIS, OESEA-16-76/OESEA-17-78;
- Environmental statements from other OWF developments within the area (Triton Knoll; Dudgeon and Sheringham Shoal OWFs extension projects);
- Harbour porpoise densities (Heinänen and Skov, 2015);
- Joint Cetacean Protocol (JCP) Phase III (Paxton *et al.*, 2016);
- Sea Watch Foundation data;
- Seal telemetry data provided by the Sea Mammal Research Unit (SMRU);
- Site-specific data collated at nearby OWFs including Docking Shoal, Dudgeon, Dudgeon & Sheringham Shoal Extensions, Hornsea Project Four, Hornsea Project One, Hornsea Project Three, Hornsea Project Two, Humber Gateway, Inner Dowsing, Lincs, Lynn, Race Bank, Sheringham Shoal, Triton Knoll, and Westermost Rough;
- Small Cetacean Abundance in the Atlantic and North Sea (SCANS II), (SMRU, 2006);



- Small Cetacean Abundance in the North Sea and Adjacent Waters (SCANS II and SCANS III) (Hammond *et al.*, 2021, Lacey *et al.*, 2022, and SCANS, 20062021);
- Special Committee on Seals (SCOS Reports);
- The Wildlife Trust (TWT) data; and,
- UK Offshore Energy Strategic Environmental Assessment (OESEA) 2 (DECC, 2011).

### 3.3.2 Site Specific Surveys

52. Monthly (and for some periods, bi-monthly) Project site specific digital aerial surveys were undertaken for both marine mammals and ornithological receptors, having started in March 2021 and concluding in August 2023. One survey per month was carried out, with the exception of March – September 2022 when two surveys per month were flown, however only 24 months of data were available to inform the Development Consent Order (DCO) Application (March 2021 – February 2023), resulting in a total survey count of 31. These surveys have a coverage of approximately 16.7% of the Project site (based on two cameras), including a 4km buffer around the perimeter of the Agreement for Lease (AfL) array area, and were focussed on gathering data relating to both marine mammal and ornithological receptors.
53. Site-specific geophysical surveys were also undertaken at the site, with MMOB and Passive Acoustic Monitoring (PAM) detections during surveys conducted for the array area between August 2021 – January 2022 and between April and July 2022 for the ECC. The surveys covered the AfL array area plus a 500m buffer, with coverage of the Silver Pit area to the west of the array.

### 3.3.3 Baseline

54. Based on all the available sources above there are six marine mammals considered likely to be present within the area surrounding the Project area (including ANS, biogenic reef and ORCP areas). This includes all four Annex II marine mammal species; Harbour porpoise *Phocoena phocoena*, bottlenose dolphin *Tursiops truncatus*, grey seal *Halichoerus grypus*, and harbour seal *Phoca vitulina*. Harbour porpoise is considered to be the most common cetacean species, with harbour porpoise within the North Sea MU having an estimated abundance of 346,601 (95% Confidence Interval (CI): 289,498 – 419,967, CV: 0.09) (IAMMWG, 2023). They have an overall conservation status of ‘unknown’ and an overall trend of ‘unknown’ (JNCC, 2019a). Harbour porpoise have a widespread distribution within the MU and were observed at the Project site during the 24 months of site-specific surveys (March 2021 – February 2023). The site-specific surveys obtained an average absolute harbour porpoise density estimate of 1.63 porpoise/km<sup>2</sup>.

55. The site-specific surveys observed three of the four marine mammal species as present within the array area, with the notable absence of bottlenose dolphin. Despite this, bottlenose dolphins are anticipated to be present in the vicinity of the Project, although in relatively low numbers for bottlenose dolphins. The Project is located in the Greater North Sea MU for bottlenose dolphins which has an estimated abundance of 2,022 (95% CI: 548 - 7,453, CV: 0.75) (IAMMWG, 2022). No bottlenose dolphins were identified in the site-specific surveys (March 2021 - February 2022) and neither were any identified in block O of the SCANS III survey (Hammond *et al.*, 2021). The SCANS III data has been used to obtain predicted density surfaces (Lacey *et al.*, 2022) and data extracted from these density surfaces showed there was a maximum density of 0.002 bottlenose dolphin/km<sup>2</sup> in both the array area and ECC.
56. Additionally, consideration has been provided for densities closer to the coast as the east coast Scottish population has been recorded ranging further south into the coast of northeast England. As no bottlenose dolphin were sighted in the site-specific surveys, no estimate for bottlenose dolphin densities in the vicinity of the Project has been calculated. As a highly precautionary estimate, 0.110 dolphins/km<sup>2</sup> within 2km of the coast of northeast England has been assumed. Therefore, this report assumes two different density estimates: 0.002 dolphins/km<sup>2</sup> (throughout entire impact range) and 0.110 dolphins/km<sup>2</sup> (2km from coast).
57. The region supports important breeding populations of both harbour seal and grey seal, with the Wash and North Norfolk SAC supporting the largest colony of harbour seal in the UK, covering 7% of the UK population. However, the 2019 population estimate shows a decrease in the population at this site, with a 27.6% reduction compared to the preceding five-year average (SCOS, 2023). Counts for 2020 and 2021 have since confirmed that the population has declined. For all sites between Donna Nook and Scroby Sands, there has been a ~30% decline in harbour seals counts compared to the mean of the previous five years (2019–2022 mean count = 3,132; 2014–2018 mean count = 4,296) (SCOS, 2023).
58. The count for The Wash and North Norfolk SAC has decreased by ~19% (2019–2022 mean = 2,758; 2015–2018 mean = 3,399), Donna Nook counts have shown a 57% decrease and Scroby Sands showed a 70% decrease (SCOS, 2023). The latest August haul-out data for harbour seals within the Southeast England MU from the 2021 dataset resulted in an estimated abundance of 3,505 (SCOS, 2023). In Volume 2, Appendix 11.1: Marine Mammal Technical Baseline (document reference 6.3.11.1) the 2021 count has been scaled by the estimated proportion hauled out (0.72, 95% CI: 0.54-0.88) (Lonergan *et al.*, 2013) to provide an estimate of 4,868 harbour seals in the Southeast England MU in 2021 (95% CI: 3,980 – 6,490). A total of 36 harbour seals have been sighted in the site-specific surveys (March 2021 - February 2023).

59. The latest August haul-out data for grey seals within the Southeast England MU from the 2021 dataset resulted in an estimated abundance of 7,694 (SCOS, 2023). Given the wide-ranging nature of grey seals (frequently travelling over 100km between haul out sites) (SCOS, 2021) and the large degree of movement between the north-east and south-east of England, it is not appropriate to consider the Southeast England MU as a discrete population unit in isolation. Therefore, combined Southeast and Northeast England MUs should be considered. In Volume 2, Appendix 11.1: Marine Mammal Technical Baseline (document reference 6.3.11.1) the 2021 count data for the Southeast England MU and combined with the Northeast England MU 2021 count data (14,211 total) has been scaled by the estimated proportion hauled out (0.2515, 95% CI: 0.2145-0.2907) (SCOS, 2022) to produce an estimate of 65,505 grey seals in the Southeast and Northeast England MUs combined (95% CI: 48,885 – 66,252). A total of 93 grey seals were recorded during the sight-specific surveys (March 2021 - February 2023).
60. Harbour seals pup during the summer months (May to August) whilst their annual molt occurs in August and September. Harbour seals tend to forage within 60km of their haul out sites, eating a wide range of prey species including sandeel, gadoids, herring, sprat, flatfish, octopus, and squid (SCOS, 2009). Grey seals forage over a very wide area, with estimated home ranges of 1,088 to 6,400km<sup>2</sup> (Dietz *et al.*, 2003). Individuals that use dispersed haul outs around the UK and European mainland coasts could theoretically forage over the Project area.
61. Designated sites for marine mammal receptors within the study area include the Southern North Sea SAC, Humber Estuary SAC, Humber Estuary Ramsar, The Wash and North Norfolk Coast SAC, Berwickshire and North Northumberland Coast SAC, Moray Firth SAC, Bancs des Flandres SCA, Doggersbank (Netherlands) SAC, Klaverbak SCI, Noordzeekustone SCI, SBZ 1 SCI, SBZ 2 SCI, SBZ 3 SCI, Vlaamse Banked SCI, Vlake van de Raan SCI, Voordelta SCI, Waddenzee SCI; Westerschelde & Saeftinghe SCI.

### 3.4 Offshore and Intertidal Ornithology

#### 3.4.1 Existing Data Sources

62. 3.4.1 The following regional datasets provide the existing baseline for offshore ornithology:

- Aerial surveys of waterbirds around the UK carried out by Wildfowl and Wetlands Trust, 2004 – 2009;
- DASs undertaken by JNCC to assess the importance of the Greater Wash to red-throated diver, little gull and common scoter;
- Bird movements during breeding season foraging trips and migratory movements e.g. Wernham *et al.* (2002), Thaxter *et al.* (2012) and Woodward *et al.* (2019);
- Publicly available reports of bird distribution in UK waters e.g. Stone *et al.* (1995), Brown and Grice (2005), Kober *et al.* (2010), Balmer *et al.* (2013), WWT (2013) and Brenchley *et al.* (2013); and

- Literature reviews including the baseline reports of other OWF developments within the area (Triton Knoll, Dudgeon, Dudgeon and Sheringham Shoal Offshore Windfarm Extensions, Race Bank, Hornsea Project One, Hornsea Project Two, Hornsea Project Three and Hornsea Project Four).

63. Intertidal birds may be disturbed by activities associated with the installation and maintenance of the export cable. The Humber Estuary as well as several other sites around the Lincolnshire coast provide great habitat for intertidal birds. The main sources of information on intertidal ornithology receptors drawn on for this report comprise:

64. Periodic surveys of bird populations along the coast as part of national programmes such as the Wetland Bird Survey (WEBS) and Non-Estuarine Wetland Survey (NEWS) organised by the British Trust for Ornithology (BTO) and the resultant web-based databases and atlases of bird distribution;

- Peer reviewed scientific papers;
- County bird reports and county avifaunas; and
- Literature reviews including the baseline reports of other OWF developments.

#### 3.4.2 Site Specific Surveys

65. Monthly (and for some periods, bi-monthly) Project site specific digital aerial surveys have been undertaken for marine mammals and ornithology, and the detail is described within Section 3.3.

66. Intertidal and onshore wintering bird surveys were undertaken at a number of potential landfall locations between November 2021 and March 2022 and October 2022 and March 2023..

#### 3.4.3 Baseline

67. Extensive ornithological surveys (as listed in above in Section 3.4.1 and 3.4.2) have shown that the southern North Sea is an important area for birds. There is a mix of bird populations present at different times including those overwintering in the area, those foraging from nearby breeding coastal colonies and those on post-breeding dispersal, migration and pre-breeding return. In addition to true pelagic seabirds (e.g. gannet *Morus bassanus*, fulmar *Fulmarus glacialis*, and auk species), other species that spend part of their annual life cycle at sea (e.g. divers, gulls and sea ducks) are also present in particular months, with periodic numbers of non-seabird migrants passing through the area (e.g. wildfowl, waders and passerines).

68. Thirty months of DAS based population estimates have been used to inform this HRA Screening Report. Aerial surveys recorded an avian assemblage typical of those found in wider surveys within the south North Sea (e.g. Stone *et al.* 1995). In total, 25 species have been recorded. Spatial distribution of birds within the project area has been assessed within the Ornithology Technical Baseline (document reference 6.1.12.1), with concentrations of seabirds likely to be an ephemeral occurrence in response to food resources and influenced by species specific bioseasons.

69. Key points from the surveys include:

- Guillemot *Uria aalge*, razorbill *Alca torda*, and kittiwake *Rissa tridactyla* were the most frequently recorded species, with the following peaks in abundance and density. Kittiwake abundance was highest in April 2021, with 5,339 birds estimated to be in the array area, at a density of 12.34 birds/km<sup>2</sup>. Guillemot abundance peaked in April 2021, with an estimated 16,821 birds at a density of 38.52 birds/km<sup>2</sup>. Razorbill peaked in February 2023 with 6,465 birds at 14.80 birds/km<sup>2</sup>;
- Gannets *Morus bassanus* were also relatively abundant, with a peak abundance of 1,091 birds, at 2.5 birds/km<sup>2</sup> in April 2022; and
- The abundance of these species in the breeding season may be linked, at least in part, to the location of the development area in relation to breeding colonies at Flamborough and Filey Coast SPA. Although outside of the mean-maximum foraging range from these colonies for most species, there may be suitable foraging habitats in the vicinity of the Project. In general bird abundance seems to be higher in the winter months – showing a similar pattern to those observed at other OWFs in the southern North Sea.

70. The intertidal bird species may migrate across the North Sea, potentially via European stop-over points, to more northern or eastern breeding grounds. Those birds undertaking that twice-yearly migration may be placed at risk of collision. Intertidal and onshore wintering bird surveys have provided information about species occurrence and abundance across the Lincolnshire coast where cable landfall is expected to occur.

### 3.5 Migratory Fish

#### 3.5.1 Existing Data Sources

71. The following regional datasets provide the existing baseline for migratory fish:

- TKOWF, site specific surveys;
- Hornsea Project Three, site specific surveys;
- Sheringham Shoal OWF herring spawning survey, and pre- and post-construction elasmobranch surveys;
- Dogger Bank Teeside A & B, site specific surveys;
- Dudgeon OWF pre-construction adult fish surveys;
- Environmental statements and/or ES from other OWF developments within the area (Triton Knoll, Hornsea Project One, Hornsea Project Two, Hornsea Project Three, Hornsea Project Four, Dudgeon and Sheringham Shoal OWFs extension projects);
- Environment Agency fish pass counts;
- International Council for the Exploration of the Sea (ICES) International Bottom Trawl Survey (IBTS);
- Information on species of conservation interest (JNCC); and
- Humber Estuary fish records.

### 3.5.2 Site Specific Surveys

72. Extant data (as listed in 3.5.1 above) provides a comprehensive characterisation of fish species collected over a long-time series across the region (1960-2022), which provides an appropriate evidence base for fish and shellfish populations within the ZoI, sufficient for the purposes of this HRA Screening Report. It is intended that these are the primary sources utilised to characterise the fish and shellfish receptors in the vicinity of the Project, as agreed through the EPP for fish and shellfish that this is sufficient to characterise the environment for these receptors (see consultation in document reference 6.1.10). However, in addition to the extant data, eDNA data has been collected to provide a snapshot of fish species presence. A total of 28 fish species were identified within the array area and ECC, including several Annex II species, Atlantic Salmon (*Salmo salar*) and shad species (*Alosa spp*). Further site-specific surveys were undertaken including grab sampling, camera transects, and epibenthic trawls, however no other Annex II species were identified.

### 3.5.3 Baseline

73. Using the information sources listed above, there are a number of species identified to migrate through the area surrounding the Project that were considered to be of conservation interest and of relevance to the OWF. These include the Annex II species Atlantic salmon *S. salar*, river lamprey *Lampetra fluviatilis*, sea lamprey *Petromyzon marinus*, Allis shad *A. alosa* and twaite shad *A. fallax*. There is one designated sites within the migratory fish study area for the Project, the Humber Estuary SAC.

## 3.6 Onshore Ecology and Ornithology

74. The Order Limits is along and near the east coast of England between the landfall near Wolla Bank, in the northeast, and the town of Spalding, in the southwest. It extends inland and parallel to approximately 70 km of the coastline, including the Lincolnshire coast of the Wash and Gibraltar Point. It extends inland up to approximately 7 km from the coast. See Figure 5.5.

### 3.6.1 Existing Data Sources

75. The following sources provide information on the European Sites (of the National Site Network) and Ramsar Sites within and around the Order Limits (boundary shown in Figure 5.5):
- JNCC website (JNCC, 2021);
  - Multi-agency Geographic Information Centre (MAGIC) website (Defra, 2021b);
  - Natural England's Designated Sites Viewer (Natural England, 2021);
  - Online atlases such as the Biological Records Centre's Online Plant Atlas and the British Trust for Ornithology's Atlas Mapstore for birds;
  - Data held in the British Trust for Ornithology's Wetland Bird Survey database; and,
  - Data held by biological records centres.

### 3.6.2 Site Specific Surveys

76. Site specific surveys of relevance to HRA Screening are the habitat survey, wintering and breeding bird surveys, and the otter survey.
77. For the habitat survey, habitat types were initially mapped from aerial images in Geographical Information System (GIS) using the UK Habitat Classification Documents V1.1 using the highest level of the UKHab Primary Habitat Hierarchy possible. This was followed up with field surveys to confirm and remap habitats using the same habitat classification system.
78. Wintering bird surveys specifically targeted wintering waterbirds, however other notable species, e.g., Schedule 1/Annex 1 raptors or particularly large concentrations of passerine species of conservation concern, were also recorded.
79. The surveys comprised:
- Through the tide surveys of the Landfall area between September 2022 and March 2023 (two visits per month). Through the tide surveys commence at either low or high tide and continue for approximately six hours to high or low tide; and
  - Winter bird surveys of the potential locations for onshore infrastructure plus a 400m buffer were completed between September 2022 and March 2023 (two visits per month).
80. Breeding bird surveys and otter surveys were conducted based on the PEIR boundary which has since been refined down to the Order Limits.

### 3.6.3 Baseline

81. The Humber Estuary has three overlapping relevant designations:
- the Humber Estuary SPA;
  - the Humber Estuary Ramsar; and,
  - the Humber Estuary SAC.
82. The designated area for the SPA and Ramsar extends southwards from the Humber Estuary along the coastline to Mablethorpe, while the southern boundary of the SAC is further north at Saltfleet. The Humber Estuary SPA is designated for its breeding and wintering birds, the Humber Estuary Ramsar for its wintering birds and sand dunes, and the Humber Estuary SAC for its marine and coastal habitats. Immediately south of the Humber Estuary SAC, the coastline is included in the northern part of Saltfleetby-Theddlethorpe Dunes & Gibraltar Point SAC. This SAC comprises two discrete parts, the northern as described above, and the southern located around Gibraltar Point to the south. Saltfleetby-Theddlethorpe Dunes & Gibraltar Point SAC is designated for its sand dunes.
83. Immediately adjacent to the southern part of the Saltfleetby-Theddlethorpe Dunes & Gibraltar Point SAC is the Wash, which has three overlapping relevant designations: the Wash SPA, the Wash Ramsar, and the Wash and North Norfolk Coast SAC. The SPA is designated for its wintering waterbirds and breeding terns, the Ramsar for its marine and coastal habitats, assemblage of waterfowl and certain species of birds, and the SAC for its marine and coastal habitats.

84. Beyond the seaward boundary of the Wash SPA and seawards from the coastline between Gibraltar Point and Mablethorpe is the Greater Wash SPA. The Greater Wash SPA is designated for its seabirds including breeding terns which nest along the coast. Gibraltar Point also has three overlapping relevant designations; Gibraltar Point SPA, Gibraltar Point Ramsar; and the southern part of Saltfleetby-Theddlethorpe Dunes & Gibraltar Point SAC. The SPA is designated for wintering birds and breeding tern and the Ramsar for wintering waterfowl, invertebrates, plants, and marine and coastal habitats.
85. In the north, the Order Limits is 12.5 km from the Humber Estuary SPA and the Humber Estuary Ramsar. In the south, the Project boundary is 0.18 km from the Wash SPA, the Wash Ramsar and the Wash and North Norfolk Coast SAC at the closest point, at The Haven River. The Order Limits is also immediately adjacent to the Greater Wash SPA at the Landfall. The southern part of Saltfleetby-Theddlethorpe Dunes & Gibraltar Point SAC is outside but within 4.1 km of the Order Limits.
86. The main habitat types recorded in the survey area were cropland, grassland, heathland and shrub, rivers and lakes, sparsely vegetated ground, woodland and forest, and urban habitats. Most of the land area is cropland, including both arable and horticulture. Grassland is the next most widespread, while sparsely vegetated land (largely concentrated at the coast), wetland, heathland and shrub, urban, woodland and rivers and streams are present but are cumulatively and individually small proportion of the land cover. Among the less frequent habitats are some which may qualify as Annex I habitats, including:
- Mudflats, which could qualify as 1140 Mudflats and sandflats not covered by seawater at low tide;
  - Saline lagoons, which could qualify as 1150 \* Coastal lagoons;
  - Coastal saltmarsh, which could qualify as 1330 Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*);
  - Coastal sand dunes, which could qualify as;
  - 2110 Embryonic shifting dunes;
  - 2120 Shifting dunes along the shoreline with *Ammophila arenaria* ("white dunes");
  - 2130 Fixed coastal dunes with herbaceous vegetation ("grey dunes");
  - 2160 Dunes with *Hippophae rhamnoides*; and
  - 2190 Humid dune slacks.
  - Lowland calcareous grassland, which could qualify as 6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) \* important orchid sites.
87. These habitats were concentrated at the coast, within the designated sites and form part of the qualifying interest of at least one SAC site, with the exception of possible 6210 calcareous grassland.



88. Records of otter were obtained during the desk study and survey. This species utilises the ditch network present with the area. It is part of the qualifying interest of the Wash and North Norfolk Coast SAC. There were no other confirmed records of terrestrial or freshwater Annex II species obtained during the desk study, other than migratory fish which are assessed separately.

89. This includes a number of wintering waterbird and raptor species were recorded at the landfall, including:

- golden plover;
- curlew;
- oystercatcher;
- redshank;
- dunlin;
- sanderling;
- grey plover;
- dark-bellied brent goose;
- wigeon;
- shelduck;
- pintail;
- common scoter;
- eider; and,
- marsh harrier.

90. Elsewhere, the wintering species recorded included:

- Avocet;
- golden plover;
- lapwing;
- curlew;
- redshank;
- Dunlin;
- Sanderling;
- dark-bellied brent goose;
- pink-footed goose;
- gadwall;
- wigeon;

- shelduck;
- common scoter; and,
- marsh harrier.

91. Breeding birds included:

- marsh harrier; and,
- avocet.

92. These species are listed on Annex I of the Birds Directive and/ or form part of the qualifying interest of at least one the SPAs or Ramsar sites mentioned above.

## 4 Determination of Screening Distances

### 4.1 Determination Process

93. Given the nature and scale of the Project and the number of sites that could potentially be affected, the HRA Screening undertaken is fronted by an initial selection process, reliant on the determination of screening distances. This process identifies sites and features for consideration throughout Screening, taking account of the approach used in the Round 4 Plan HRA (The Crown Estate, 2022) and following the process used for other projects including, for example, Awel y Môr, Five Estuaries, and Hornsea Project Four OWFs. This is achieved through a receptor-based approach with a source-pathway-receptor methodology, where a receptor can only be impacted by an effect if a pathway exists through which the effect can be transmitted between the source activity and the receptor.
94. This step to the process essentially provides a long list of designated sites identified on the basis of potential spatial connectivity to the Project, to be taken forward for consideration of potential for LSE. Sites are identified based on the maximum range of effects, however effects are only subsequently screened through for assessment if the potential for connectivity exists, and if the site is beyond the considered range for effects it is screened out. The potential effects associated with the construction, operation and maintenance, and decommissioning of the Project for each receptor are presented in Section 5.
95. Where a designated site is designated for features covering multiple receptor groups, the site has been repeated in all relevant sections below, with only the features relevant to the specific receptor group presented in the relevant section.

### 4.2 Screening Distances Applied for Subtidal and Intertidal Benthic Receptors

96. An initial screening range of 20 km from the Project was applied to identify all designated sites with intertidal and subtidal benthic features on a highly precautionary basis for the maximum potential effect from the Project. However, following sediment modelling, final screening ranges of 12km from the array and ANS', and 15 km from the ECC have been applied, based on the impact with the largest zone of influence which is considered to be the tidal ellipses for increased suspended sediment concentrations and deposition.

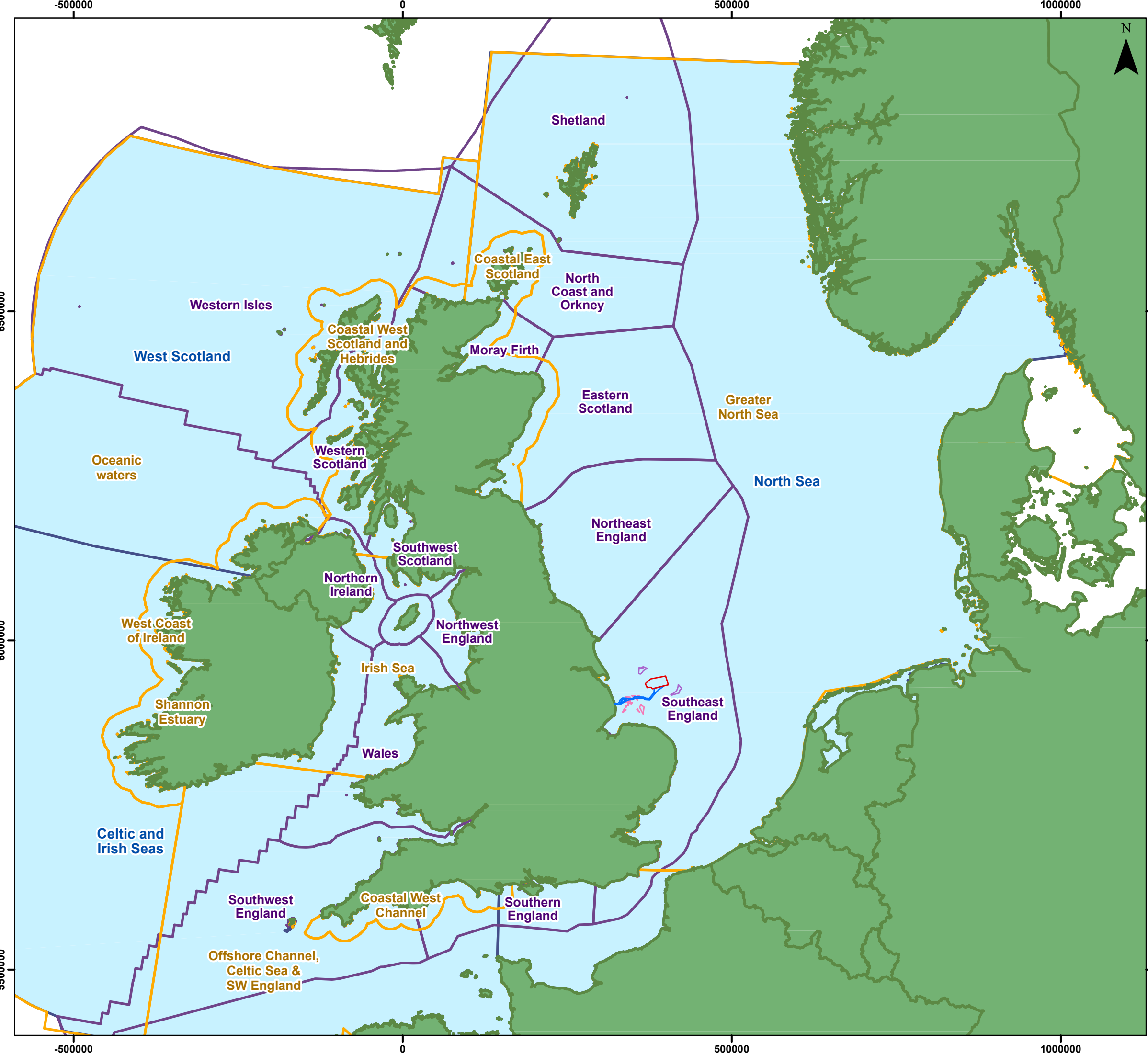
### 4.3 Screening Distances Applied for Marine Mammal Receptors

97. The marine mammal distances applied are dependent on the species in question and their relevant management units (MUs). The process is concerned with the four Annex II marine mammal species identified within the Project area (including ANS', ORCP's and reef areas) for which SACs may be designated, with the relevant MUs defining the study area for each species, as described in Table 4.1. The MUs are illustrated in Figure 4.1.

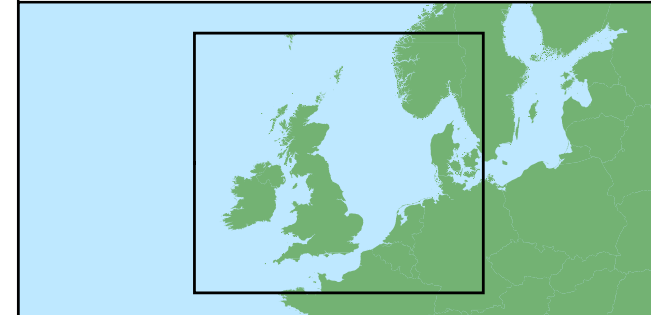
Table 4.1: Marine Mammal Receptors with overlapping MU's with the Project

Receptor Species	Relevant MU
Harbour porpoise <i>Phocoena phocoena</i>	North Sea MU
Bottlenose dolphin <i>Tursiops truncatus</i>	Greater North Sea MU
Grey seal <i>Halichoerus grypus</i>	Southeast England and Northeast England MUs
Harbour seal <i>Phoca vitulina</i>	Southeast England and Northeast England MUs

98. All designated sites for marine mammal species within these MUs are considered within the screening stage. Should wider connectivity be evident (beyond the range of the MU), then that will also be taken into consideration for screening.



- Legend**
- ▭ Array Area
  - ▭ Offshore Export Cable Corridor
  - ▭ Artificial Nesting Structure Area
  - ▭ Biogenic Reef Restoration Area
  - ▭ Harbour & Grey Seal Management Units
  - ▭ Harbour Porpoise Management Units
  - ▭ Bottlenose Dolphin Management Units



Coordinate System: WGS 1984 UTM Zone 31N  
 0 100 200 km  
 Scale: 1:5,500,000  
 A3 Page Size

Environmental Statement  
 Relevant Marine Mammal MUs  
 Figure 4.1



Date: 13/02/2024  
 Produced By: BPHB  
 Revision: 0.1  
 Contains ESRI Basemapping:  
**GoBe**

Document Path: Z:\GIS\GIS - Projects\0152 Outer Dowsing ELA\GIS\Figures\ES\HRA Screening\ODOW\_0152\_HRA\_Fig\_1\_Marine Mammal MUs.mxd

## 4.4 Screening Distances Applied for Offshore and Intertidal Ornithology

### Receptors

99. Initial site selection for offshore and intertidal ornithology identified all EU Sites (Natura 2000) and the National Site Network with designated ornithology features located within a range defined by the criteria outlined in Table 4.2 below. The Ornithology Screening Table (Table 5.6) considers all UK coastal SPAs and Ramsar Sites and identifies those sites where a designated feature falls into the criteria outlined in Table 4.2. Those sites where no species are identified to fall within the criteria are not taken through for consideration for screening. The resulting sites screened in as shown in Table 5.6 are considered in-combination within Section 7.3 below.
100. For non-breeding bio-seasons, such as migration periods, connectivity to SPA's will be considered within the context of appropriate biologically defined minimum population scales, as defined by Furness *et al.* (2015).
101. Birds have not been categorised in Table 5.6: Offshore and Intertidal Ornithology Screening, to keep the screening table compact. However, consideration to biological relationships related to breeding biology, feeding, habitat use and migratory pathways was made in the Potential for LSE column of Table 5.6. The main categories considered were:
- Breeding seabirds;
  - Non-breeding seabirds; and,
  - Non-breeding waterbirds.

Table 4.2: Site Selection Criteria.

Criteria	Definition	Relevant Distance/Range to Determine Connectivity with Qualifying Features
Criterion 1	National Site Network/Special Protection Areas and Ramsar Sites which have physical overlap with the Project array area.	Overlap between designated site and array area. The infrastructure areas do not overlap with any Special Protection Areas and Ramsar Sites.
Criterion 2	National Site Network/European and Ramsar Sites that occur within a species-specific defined range of effect (in this case mean-maximum foraging (MMF) range +1 Standard Deviation, hereafter referred to as MMF+1SD), of the Project.  This Criterion only identifies sites with seabird receptors that are interest features in the breeding season since it is only at that part of the year that a numeric range can be stated based on foraging distances from the designated site. Consequently, only breeding	Overlap between designated site and offshore ZoI. MMF+1SD, Woodward <i>et al.</i> , (2019) provides the most up-to-date, robust collation of seabird foraging ranges based on multiple individuals from numerous study colonies. Table 4.3 below provides an overview of Woodward <i>et al.</i> (2019) foraging ranges used to determine connectivity.

Criteria	Definition	Relevant Distance/Range to Determine Connectivity with Qualifying Features
	features of relevant SPAs/Ramsar Sites are assessed for Criterion 2.	
Criterion 3	National Site Network/European SPAs and Ramsar Sites which occur within range of the maximum expected extent of displacement/ disturbance to wintering birds due to Project activities.	Intertidal: 0.5 km Seaducks: 4 km Divers: 10 km (Ranges based on advice from Statutory Nature Conservation Bodies (SNCBs), 2022 and recent stakeholder discussion (relevant to red-throated diver).
Criterion 4	Designated sites for breeding interest features that might pass through the array on migration or in winter. Relevant breeding SPAs for each species from SPAs located along the eastern seaboard of the UK have been considered for the determination of LSE.	Whether the designated site is on the eastern seaboard of the UK and north, north-west or north-east of the Project array. SPA's with migratory waterbirds as features, within 100 km of the project area, have been screened in.

Table 4.3: MMF Range, Standard Deviation (SD) and MMF Range +1SD of UK Breeding Bird Species used to Screen against Criterion 2 (Woodward *et al.*, 2019).

Species	Mean-Max Foraging Range (km)	Standard Deviation (SD) (km)	Mean-Max +1SD (km)
Arctic tern	25.7	14.8	40.5
Atlantic puffin	137.1	128.3	265.4
Black guillemot	4.8	4.3	9.1
Black-headed gull	18.5	0.0	18.5
Black-legged kittiwake	156.1	144.5	300.6
Common eider	21.5	0.0	21.5
Common guillemot	73.2	80.5	153.7
Common gull	50.0	0.0	50.0
Common tern	18.0	8.9	26.9
European shag	13.2	10.5	23.7
European storm-petrel	336.0	0.0	336.0
Great black-backed gull	73.0	0.0	73.0
Great cormorant	25.6	8.3	33.9
Great skua	443.3	487.9	931.2
Herring gull	58.8	26.8	85.6
Lesser black-backed gull	127.0	109.0	236.0
Little tern	5.0	0.0	5.0
Manx shearwater	1346.8	1018.7	2365.5
Mediterranean gull	20.0	0.0	20.0
Northern fulmar	542.3	657.9	1200.2
Northern gannet	315.2	194.2	509.4
Razorbill	88.7	75.9	164.6

Species	Mean-Max Foraging Range (km)	Standard Deviation (SD) (km)	Mean-Max +1SD (km)
Red-throated diver	9.0	0.0	9.0
Roseate tern	12.6	10.6	23.2
Sandwich tern	34.3	23.2	57.5

#### 4.5 Screening Distances Applied for Migratory Fish Receptors

102. Following approach adopted by other OWFs in the region, a highly precautionary range of 100 km to the relevant estuary mouth was considered for the screening process. Underwater noise is considered to be the impact with the largest range affecting migratory fish and a screening distance of 100 km is considerably greater than the potential noise footprint of the Project (~one and a half times the maximum range for the 135 decibel (dB) Sound Exposure Level (SEL) contour (see Appendix 3.1: Underwater Noise Technical Report; Document Reference 6.3.3.1)); therefore 100 km from the array, ECC and ANS' is considered a precautionary and inclusive range for the screening process.

#### 4.6 Screening Distances Applied for Onshore Ecology and Ornithology Receptors

103. The initial study area comprised the Order Limits plus 15 km, in line with standard practice. All National Site Network and Ramsar Sites within this study area have been identified, together with their qualifying interest features. The initial study area based on 15 km is a pragmatic starting point and is based on existing guidance for plans rather than projects (Scott Wilson *et al.*, 2006). It is precautionary and exceeds the impact risk zones (IRZs) for designated sites that have been set by Natural England (Natural England, 2023). A summary of these sites is provided in Table 5.9: Summary of Potential Effects on European and Ramsar Sites (Onshore).

104. Impacts occurring within the Order Limits are not likely to be perceptible at designated sites beyond 15 km however the possibility cannot be fully excluded and sites beyond this distance may need to be screened in if potential impacts and potential additional pathways are identified at later stages of the assessment. For example, it may be necessary to consider designated sites beyond this distance that are close to routes being used by construction traffic, or which are used by migratory birds which also use sites within the Order Limits, such as pink-footed geese of North Norfolk Coast SPA located 22 km from the Order Limits.



## 5 Screening

### 5.1 Screening Consultation

105. Discussions regarding the Project have been held with key stakeholders as detailed above in Section 1.3, including Natural England and the Royal Society for the Protection of Birds (RSPB). Consultation has also been held in relation to derogation and compensation (including derogation specific Expert Topic Groups (ETGs) and Natural England cable corridor workshops). Consultation has taken place through bilateral meetings with consultees and has been discussed in depth within the relevant Expert Topic Groups (ETGs). Consultation on this Screening Report has also been taken into account when drafting the RIAA.

### 5.2 Subtidal and Intertidal Benthic Ecology Screening

106. The study area for subtidal and intertidal benthic ecology for this project with respect to Stage 1 Screening is defined by the maximum range of relevant effects from the Project. Initial site selection identified all sites with designated benthic features located within a 20 km range of the array area.

107. The potential effects to be considered are identified in, including the types of activity that could result in such effects at different stages of development. The maximum range of all such effects has been identified as 15 km from the ECC and 12 km from the array and ANS', as defined by modelling which defines these values as the maximum potential range for suspended sediment concentrations (the potential effect with the largest ZoI).

**Table 5.1: Benthic Ecology Receptor Group Potential Effects**

Potential Effect	Activities Potentially Resulting in Effect Construction	Operation and Maintenance	Decommissioning
Physical habitat loss/ disturbance	<ul style="list-style-type: none"> <li>▪ Installation of structures</li> <li>▪ Seabed preparation</li> <li>▪ Seabed dredging</li> <li>▪ Sediment disposal</li> <li>▪ Installation of scour or cable protection</li> <li>▪ Vessel movements/ anchoring</li> <li>▪ All in- combination effects</li> </ul>	<ul style="list-style-type: none"> <li>▪ Physical presence of structures</li> <li>▪ Maintenance of structures</li> <li>▪ Presence of scour or cable protection</li> <li>▪ All in-combination effects</li> </ul>	<ul style="list-style-type: none"> <li>▪ Removal of structures</li> <li>▪ Seabed preparation</li> <li>▪ Seabed dredging</li> <li>▪ Sediment disposal</li> <li>▪ Removal of scour or cable protection</li> <li>▪ Vessel movements/ anchoring</li> <li>▪ All in- combination effects</li> </ul>
Suspended sediment/ deposition	<ul style="list-style-type: none"> <li>▪ Installation of structures</li> </ul>	<ul style="list-style-type: none"> <li>▪ Maintenance of structures</li> </ul>	<ul style="list-style-type: none"> <li>▪ Removal of structures</li> </ul>

Potential Effect	Activities Potentially Resulting in Effect		
	Construction	Operation and Maintenance	and Decommissioning
	<ul style="list-style-type: none"> <li>▪ Seabed preparation</li> <li>▪ Seabed dredging and sandwave clearance</li> <li>▪ Installation of scour or cable protection</li> <li>▪ All in- combination effects</li> </ul>	<ul style="list-style-type: none"> <li>▪ All in-combination effects</li> </ul>	<ul style="list-style-type: none"> <li>▪ Seabed preparation</li> <li>▪ Seabed dredging and sandwave clearance</li> <li>▪ Removal of scour or cable protection</li> <li>▪ All in- combination effects</li> </ul>
Indirect pollution (release of contaminants within the sediment)	<ul style="list-style-type: none"> <li>▪ Installation of structures</li> <li>▪ Seabed preparation</li> <li>▪ Seabed dredging and sandwave clearance</li> <li>▪ Installation of scour or cable protection</li> <li>▪ All in- combination effects</li> </ul>	<ul style="list-style-type: none"> <li>▪ Maintenance of structures</li> <li>▪ All in-combination effects</li> </ul>	<ul style="list-style-type: none"> <li>▪ Removal of structures</li> <li>▪ Seabed preparation</li> <li>▪ Seabed dredging and sandwave clearance</li> <li>▪ Removal of scour or cable protection</li> <li>▪ All in- combination effects</li> </ul>
Accidental pollution	<ul style="list-style-type: none"> <li>▪ Release of pollutants from all activities associated with the development</li> <li>▪ All in-combination effects</li> </ul>		
Invasive non-native species (INNS)	<ul style="list-style-type: none"> <li>▪ Vessel movements on and off site</li> <li>▪ Installation of solid structures</li> <li>▪ All in-combination effects</li> </ul>	<ul style="list-style-type: none"> <li>▪ Vessel movements on and off site</li> <li>▪ Maintenance activities</li> <li>▪ Physical presence of structures</li> <li>▪ All in-combination effects</li> </ul>	<ul style="list-style-type: none"> <li>▪ Vessel movements on and off site</li> <li>▪ Removal of solid structures</li> <li>▪ All in-combination effects</li> </ul>
Electromagnetic Fields (EMF)	<ul style="list-style-type: none"> <li>▪ N/A</li> </ul>	<ul style="list-style-type: none"> <li>▪ Generation of EMF from installed cables</li> </ul>	<ul style="list-style-type: none"> <li>▪ N/A</li> </ul>
Changes to physical processes	<ul style="list-style-type: none"> <li>▪ Installation of structures</li> <li>▪ All in-combination effects</li> </ul>	<ul style="list-style-type: none"> <li>▪ Physical presence of structures</li> <li>▪ Installation of cable and scour protection (where required)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Removal of structures</li> <li>▪ All in-combination effects</li> </ul>

108. Stage 1 Screening (as presented in Table 5.2) determines the potential for a pathway to exist between the Project and each designated site identified based on the screening ranges identified for impacts arising during construction, operation and maintenance and decommissioning. Where potential for an impact to impinge on the conservation objectives of a site is identified, potential for LSE is concluded. All sites where a potential for LSE has been concluded for benthic receptors are depicted in Figure 5.1.

Table 5.2: Potential for LSE for Subtidal and Intertidal Benthic Ecology

Designated Site	Distance to Array (km)	Distance to ECC (km)	Distance to ANS (km)	Distance to biogenic reef (km)	Distance to ORCP (km)	Feature(s) to Consider for Potential LSE	Potential Effects Construction	Operation and Maintenance	Decommissioning	Potential for LSE
North Norfolk Sandbanks and Saturn Reef SAC	5.9	17.7	0.0	39.5	69.6	<ul style="list-style-type: none"> <li>Reefs</li> <li>Sandbanks which are slightly covered by sea water all of the time</li> </ul>	<ul style="list-style-type: none"> <li>Suspended sediment/ deposition</li> <li>Indirect Pollution</li> <li>Accidental Pollution</li> <li>INNS</li> <li>Changes to physical processes</li> </ul>	<ul style="list-style-type: none"> <li>Suspended sediment/ deposition</li> <li>Indirect pollution</li> <li>Accidental Pollution</li> <li>INNS</li> <li>Changes to physical processes</li> </ul>	<ul style="list-style-type: none"> <li>Suspended sediment/ deposition</li> <li>Indirect Pollution</li> <li>Accidental Pollution</li> <li>INNS; and</li> <li>Changes to physical processes</li> </ul>	<p>The site is within the maximum range for sediment transport as informed by modelling. The same modelling ranges is considered appropriate for indirect pollution, accidental pollution, and changes to physical processes. The proximity to site also results in the potential for the Project to facilitate the movement of INNS. <b>Therefore, there is a potential for LSE from these effects.</b></p>
							<ul style="list-style-type: none"> <li>Physical habitat loss/ disturbance</li> </ul>	<ul style="list-style-type: none"> <li>EMF</li> </ul>	<ul style="list-style-type: none"> <li>Physical habitat loss/ disturbance</li> </ul>	
Inner Dowsing Sandbanks and Saturn Reef SAC	17.8	0.0	30.0	0.0	0.0	<ul style="list-style-type: none"> <li>Reefs</li> <li>Sandbanks which are slightly covered by sea water all of the time</li> </ul>	<ul style="list-style-type: none"> <li>Physical habitat loss/disturbance</li> <li>Suspended sediment/ deposition</li> <li>Indirect Pollution</li> <li>Accidental Pollution</li> <li>INNS</li> <li>Changes to physical processes</li> </ul>	<ul style="list-style-type: none"> <li>Physical habitat loss/ disturbance</li> <li>Suspended sediment/ deposition</li> <li>Indirect Pollution</li> <li>Accidental Pollution</li> <li>INNS</li> <li>Changes to physical processes</li> <li>EMF</li> </ul>	<ul style="list-style-type: none"> <li>Physical habitat loss/ disturbance</li> <li>Suspended sediment/ deposition</li> <li>Indirect Pollution</li> <li>Accidental Pollution</li> <li>INNS</li> <li>Changes to physical processes</li> </ul>	<p>The site is within the maximum range for sediment transport as informed by modelling. The same modelling ranges is considered appropriate for indirect pollution, accidental pollution, and changes to physical processes. The proximity to site also results in the potential for the Project to facilitate the movement of INNS. <b>Therefore, there is a potential for LSE from these effects.</b></p>

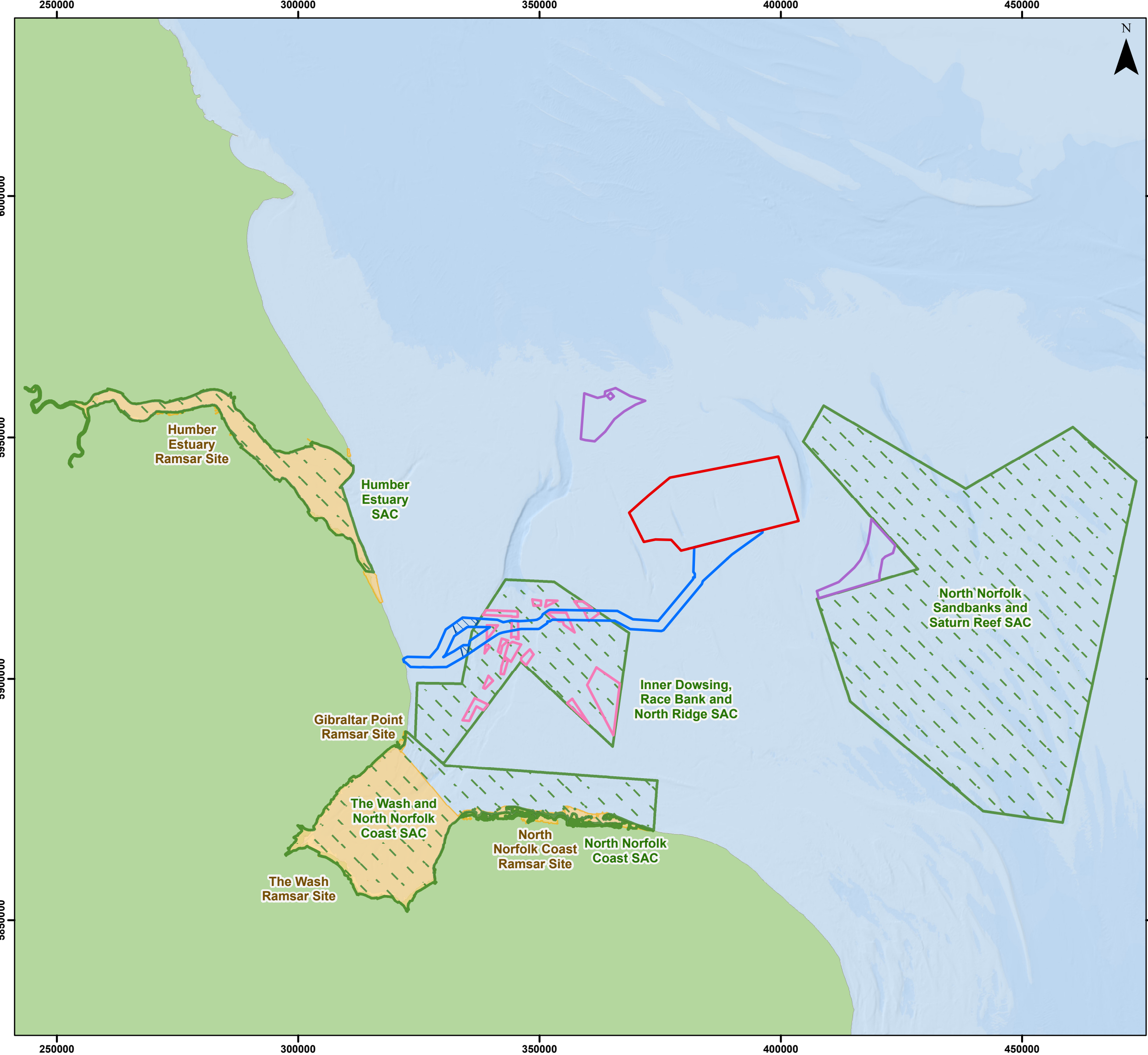
Designated Site	Distance to Array (km)	Distance to ECC (km)	Distance to ANS (km)	Distance to biogenic reef (km)	Distance to ORCP (km)	Feature(s) to Consider for Potential LSE	Potential Effects Construction	Operation and Maintenance	Decommissioning	Potential for LSE
The Wash and North Norfolk Coast SAC	48.4	13.4	50.4	0.0	19.3	<ul style="list-style-type: none"> <li>Sandbanks which are slightly covered by sea water all of the time</li> <li>Mudflats and sandflats not covered by seawater at low tide</li> <li>Large shallow inlets and bays</li> <li>Reefs</li> <li>Salicornia and other annuals colonizing mud and sand</li> <li>Atlantic salt meadows (<i>Glauco-Puccinellietalia maritima</i>)</li> </ul>	<ul style="list-style-type: none"> <li>Suspended sediment/deposition</li> <li>Indirect Pollution</li> <li>Accidental Pollution</li> <li>INNS</li> <li>Changes to physical processes</li> </ul>	<ul style="list-style-type: none"> <li>Suspended sediment/deposition</li> <li>Indirect Pollution</li> <li>Accidental Pollution</li> <li>INNS</li> <li>Changes to physical processes.</li> </ul>	<ul style="list-style-type: none"> <li>Suspended sediment/deposition;</li> <li>Indirect Pollution</li> <li>Accidental Pollution</li> <li>INNS</li> <li>Changes to physical processes</li> </ul>	The site is within the maximum range for sediment transport as informed by modelling. The same modelling ranges is considered appropriate for indirect pollution, accidental pollution, and changes to physical processes. The proximity to site also results in the potential for the Project to facilitate the movement of INNS. <b>Therefore, there is a potential for LSE from these effects.</b>
							<ul style="list-style-type: none"> <li>Physical habitat loss/disturbance</li> </ul>	<ul style="list-style-type: none"> <li>EMF</li> </ul>	<ul style="list-style-type: none"> <li>Physical habitat loss/ disturbance</li> </ul>	Due to the distance of the site, physical habitat loss/disturbance and EMF effects are not anticipated to arise due to the distance from the site. EMF effects only arise from the cables when in operation and therefore there is no pathway for effect for EMF during construction and decommissioning. <b>Therefore, there is no potential for an LSE for either of these effects.</b>
Humber Estuary Ramsar	54.0	12.1	47.5	18.2	15.3	<ul style="list-style-type: none"> <li>Dune systems with humid dune slacks</li> <li>Estuarine waters</li> <li>Intertidal mud and sand flats</li> <li>Saltmarshes</li> <li>Coastal brackish/saline lagoons</li> </ul>	<ul style="list-style-type: none"> <li>Suspended sediment/deposition</li> <li>Indirect Pollution</li> <li>Accidental Pollution</li> <li>INNS</li> <li>Changes to physical processes</li> </ul>	<ul style="list-style-type: none"> <li>Suspended sediment/deposition</li> <li>Indirect Pollution</li> <li>Accidental Pollution</li> <li>INNS</li> <li>Changes to physical processes.</li> </ul>	<ul style="list-style-type: none"> <li>Suspended sediment/deposition</li> <li>Indirect Pollution</li> <li>Accidental Pollution</li> <li>INNS</li> <li>Changes to physical processes</li> </ul>	The site is within the maximum range for sediment transport as informed by modelling. The same modelling ranges is considered appropriate for indirect pollution, accidental pollution, and changes to physical processes. The proximity to site also results in the potential for the Project to facilitate the movement of INNS. <b>Therefore, there is a potential for LSE from these effects.</b>
							<ul style="list-style-type: none"> <li>Physical habitat loss/ disturbance</li> </ul>	<ul style="list-style-type: none"> <li>EMF</li> </ul>	<ul style="list-style-type: none"> <li>Physical habitat loss/ disturbance</li> </ul>	Due to the distance of the site, physical habitat loss/disturbance and EMF

Designated Site	Distance to Array (km)	Distance to ECC (km)	Distance to ANS (km)	Distance to biogenic reef (km)	Distance to ORCP (km)	Feature(s) to Consider for Potential LSE	Potential Effects Construction	Operation and Maintenance	Decommissioning	Potential for LSE
										effects are not anticipated to arise due to the distance from the site. EMF effects only arise from the cables when in operation and therefore there is no pathway for effect for EMF during construction and decommissioning. <b>Therefore, there is no potential for a LSE for either of these effects.</b>
Humber Estuary SAC	54.4	18.5	47.5	23.8	19.7	<ul style="list-style-type: none"> <li>▪ Estuaries</li> <li>▪ Mudflats and sandflats not covered by seawater at low tide</li> <li>▪ Sandbanks which are slightly covered by sea water all the time</li> <li>▪ Salicornia and other annuals colonizing mud and sand</li> <li>▪ Atlantic salt meadows</li> </ul>	<ul style="list-style-type: none"> <li>▪ Physical habitat loss/ disturbance</li> <li>▪ Suspended sediment/ deposition</li> <li>▪ Indirect Pollution</li> <li>▪ Accidental Pollution</li> <li>▪ INNS</li> <li>▪ Changes to physical processes</li> </ul>	<ul style="list-style-type: none"> <li>▪ Physical habitat loss/ disturbance</li> <li>▪ Suspended sediment/ deposition</li> <li>▪ Indirect Pollution</li> <li>▪ Accidental Pollution</li> <li>▪ INNS</li> <li>▪ Changes to physical processes.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Physical habitat loss/ disturbance</li> <li>▪ Suspended sediment/ deposition</li> <li>▪ Indirect Pollution</li> <li>▪ Accidental Pollution</li> <li>▪ INNS</li> <li>▪ Changes to physical processes</li> </ul>	The site is within the maximum range for sediment transport as informed by modelling. The same modelling ranges is considered appropriate for indirect pollution, accidental pollution, and changes to physical processes. The proximity to site also results in the potential for the Project to facilitate the movement of INNS. <b>Therefore, there is a potential for LSE from these effects.</b>
							<ul style="list-style-type: none"> <li>▪ Physical habitat loss/ disturbance</li> </ul>	<ul style="list-style-type: none"> <li>▪ EMF</li> </ul>	<ul style="list-style-type: none"> <li>▪ Physical habitat loss/ disturbance</li> </ul>	Due to the distance of the site, physical habitat loss/disturbance and EMF effects are not anticipated to arise due to the distance from the site. EMF effects only arise from the cables when in operation and therefore there is no pathway for effect for EMF during construction and decommissioning. <b>Therefore, there is no potential for a LSE for either of these effects.</b>
Gibraltar Point Ramsar	63.1	13.3	70.5	1.6	19.3	<ul style="list-style-type: none"> <li>▪ Estuarine mudflats</li> <li>▪ Sandbanks</li> <li>▪ Saltmarsh</li> <li>▪ Dunes</li> </ul>	<ul style="list-style-type: none"> <li>▪ Suspended sediment/ deposition</li> <li>▪ Indirect Pollution</li> </ul>	<ul style="list-style-type: none"> <li>▪ Suspended sediment/ deposition</li> <li>▪ Indirect Pollution</li> </ul>	<ul style="list-style-type: none"> <li>▪ Suspended sediment/ deposition</li> <li>▪ Indirect Pollution</li> </ul>	The site is within the maximum range for sediment transport as informed by modelling. The same modelling ranges is considered appropriate for indirect pollution, accidental pollution, and changes to

Designated Site	Distance to Array (km)	Distance to ECC (km)	Distance to ANS (km)	Distance to biogenic reef (km)	Distance to ORCP (km)	Feature(s) to Consider for Potential LSE	Potential Effects Construction	Operation and Maintenance	Decommissioning	Potential for LSE
							<ul style="list-style-type: none"> <li>Accidental Pollution</li> <li>INNS</li> <li>Changes to physical processes</li> </ul>	<ul style="list-style-type: none"> <li>Accidental Pollution</li> <li>INNS</li> <li>Changes to physical processes</li> </ul>	<ul style="list-style-type: none"> <li>Accidental Pollution</li> <li>INNS</li> <li>Changes to physical processes</li> </ul>	<p>physical processes. The proximity to site also results in the potential for the Project to facilitate the movement of INNS. <b>Therefore, there is a potential for LSE from these effects.</b></p>
							<ul style="list-style-type: none"> <li>Physical habitat loss/ disturbance</li> </ul>	<ul style="list-style-type: none"> <li>EMF</li> </ul>	<ul style="list-style-type: none"> <li>Physical habitat loss/ disturbance</li> </ul>	<p>Due to the distance of the site, physical habitat loss/disturbance and EMF effects are not anticipated to arise due to the distance from the site. EMF effects only arise from the cables when in operation and therefore there is no pathway for effect for EMF during construction and decommissioning. <b>Therefore, there is no potential for a LSE for either of these effects.</b></p>
The Wash Ramsar	66.5	16.4	74.0	3.8	22.7	<ul style="list-style-type: none"> <li>Saltmarshes</li> <li>Estuaries</li> <li>Major intertidal banks of sand and mud</li> <li>Shallow water</li> <li>Deep channels</li> </ul>	<ul style="list-style-type: none"> <li>Physical habitat loss/ disturbance</li> <li>Suspended sediment/ deposition</li> <li>Indirect Pollution</li> <li>Accidental Pollution</li> <li>INNS</li> <li>Changes to physical processes</li> </ul>	<ul style="list-style-type: none"> <li>Physical habitat loss/ disturbance</li> <li>Suspended sediment/ deposition</li> <li>Indirect Pollution</li> <li>Accidental Pollution</li> <li>INNS</li> <li>Changes to physical processes</li> <li>EMF</li> </ul>	<ul style="list-style-type: none"> <li>Physical habitat loss/ disturbance</li> <li>Suspended sediment/ deposition</li> <li>Indirect Pollution</li> <li>Accidental Pollution</li> <li>INNS</li> <li>Changes to physical processes</li> </ul>	<p>The site is within the maximum range for sediment transport as informed by modelling. The same modelling ranges is considered appropriate for indirect pollution, accidental pollution, and changes to physical processes. The proximity to site also results in the potential for the Project to facilitate the movement of INNS. <b>Therefore, there is a potential for LSE from these effects.</b></p>
							<ul style="list-style-type: none"> <li>Physical habitat loss/disturbance</li> </ul>	<ul style="list-style-type: none"> <li>EMF</li> </ul>	<ul style="list-style-type: none"> <li>Physical habitat loss/ disturbance</li> </ul>	<p>Due to the distance of the site, physical habitat loss/disturbance and EMF effects are not anticipated to arise due to the distance from the site. EMF effects only arise from the cables when in operation and therefore there is no pathway for effect for</p>

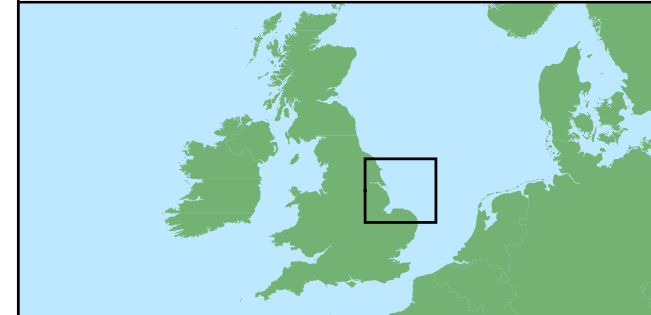
Designated Site	Distance to Array (km)	Distance to ECC (km)	Distance to ANS (km)	Distance to biogenic reef (km)	Distance to ORCP (km)	Feature(s) to Consider for Potential LSE	Potential Effects Construction	Operation and Maintenance	Decommissioning	Potential for LSE
										EMF during construction and decommissioning. <b>Therefore, there is no potential for a LSE for either of these effects.</b>





**Legend**

- Array Area
- Offshore Export Cable Corridor
- ORCP Area
- Artificial Nesting Structure Area
- Biogenic Reef Restoration Area
- Ramsar Site
- Special Areas of Conservation (SAC)



Coordinate System: WGS 1984 UTM Zone 31N  
 0 20 40 km  
 Scale: 1:750,000 A3 Page Size

Environmental Statement  
 Designated Sites with a Potential for LSE for Subtidal and Intertidal Benthic Receptors  
 Figure 5.1



Date: 13/02/2024  
 Produced By: BPHB  
 Revision: 0.1

Contains ESRI Basemapping; Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

Document Path: Z:\GIS\GIS - Projects\0152 Outer Dowsing EIA\GIS\Figures\ES\HRA Screening\ODOW\_0152\_HRA\_Fig5.1\_SACs\_Benthic\_Receptors.mxd

### 5.3 Marine Mammal Screening

109. Table 5.3 presents the potential activities and resulting effects considered for the marine mammal receptors identified in Table 4.1.

Table 5.3: Marine Mammal Receptor Group Potential Effects

Potential Effect	Activities Potentially Resulting in Effect		
	Construction	Operation and Maintenance	Decommissioning
Underwater noise	<ul style="list-style-type: none"> <li>▪ Piling</li> <li>▪ Unexploded Ordnance (UXO)</li> <li>▪ Construction vessel noise</li> <li>▪ Other construction activities</li> <li>▪ Acoustic/geophysical surveys</li> <li>▪ Acoustic Deterrent Devices (ADD)</li> <li>▪ Any in-combination effects identified</li> </ul>	<ul style="list-style-type: none"> <li>▪ Acoustic/geophysical surveys</li> <li>▪ Vessel noise</li> <li>▪ Operational noise</li> <li>▪ All in-combination effects</li> </ul>	<ul style="list-style-type: none"> <li>▪ Piling</li> <li>▪ UXO</li> <li>▪ Construction vessel noise</li> <li>▪ Other construction activities</li> <li>▪ Acoustic/geophysical surveys</li> <li>▪ Acoustic Deterrent Devices (ADD)</li> <li>▪ Any in-combination effects identified</li> </ul>
Vessel disturbance	<ul style="list-style-type: none"> <li>▪ Construction vessel movements</li> <li>▪ Survey vessel movements</li> <li>▪ Any in-combination effects identified</li> </ul>	<ul style="list-style-type: none"> <li>▪ Maintenance vessel movements</li> <li>▪ Survey vessel movements</li> <li>▪ All in-combination effects</li> </ul>	<ul style="list-style-type: none"> <li>▪ Construction vessel movements</li> <li>▪ Survey vessel movements</li> <li>▪ Any in-combination effects identified</li> </ul>
Collision risk	<ul style="list-style-type: none"> <li>▪ Vessel collision risk</li> <li>▪ Any in-combination effects identified.</li> </ul>		
Indirect pollution (release of contaminants within the sediment)	<ul style="list-style-type: none"> <li>▪ Installation of structures</li> <li>▪ Seabed preparation</li> <li>▪ Seabed dredging and sandwave clearance</li> <li>▪ Installation of scour or cable protection</li> <li>▪ Any in-combination effects identified</li> </ul>	<ul style="list-style-type: none"> <li>▪ Maintenance of structures</li> <li>▪ All in-combination effects</li> </ul>	<ul style="list-style-type: none"> <li>▪ Removal of structures</li> <li>▪ Seabed preparation;</li> <li>▪ Seabed dredging and sandwave clearance</li> <li>▪ Installation of scour or cable protection</li> <li>▪ Any in-combination effects identified</li> </ul>
Accidental pollution	<ul style="list-style-type: none"> <li>▪ Release of pollutants from all activities associated with the development</li> <li>▪ Any in-combination effects identified</li> </ul>		
Changes to prey	<ul style="list-style-type: none"> <li>▪ Generation of underwater noise from construction/maintenance activities</li> <li>▪ Loss of supporting habitats (via all activities listed for habitats loss/disturbance in Table 5.1)</li> <li>▪ Vessel movements</li> </ul>		

Potential Effect	Activities Potentially Resulting in Effect		
	Construction	Operation and Maintenance	Decommissioning
	<ul style="list-style-type: none"> <li>▪ EMF</li> <li>▪ Any in-combination effects identified</li> </ul>		
Habitat Loss	<ul style="list-style-type: none"> <li>▪ Removal of supporting habitat during installation of structures</li> <li>▪ Any in-combination effects identified</li> </ul>	<ul style="list-style-type: none"> <li>▪ Prey habitat loss in footprint of structure/cable protection</li> <li>▪ Any in-combination effects identified</li> </ul>	<ul style="list-style-type: none"> <li>▪ Removal of supporting habitat during removal of structures</li> <li>▪ Any in-combination effects identified</li> </ul>
Disturbance to seals at haul out (non-physical disturbance)	<ul style="list-style-type: none"> <li>▪ Vessel movements</li> <li>▪ Any in-combination effects identified</li> </ul>		

110. Stage 1 Screening (as presented in Table 5.4) determines the potential for a pathway to exist between the Project and each designated site identified based on the screening ranges identified for impacts arising during construction, operation and maintenance and decommissioning. Where potential for an impact to impinge on the conservation objectives of a site is identified, potential for LSE is concluded. All sites where a potential for LSE has been concluded for marine mammal receptors are depicted in Figure 5.2.

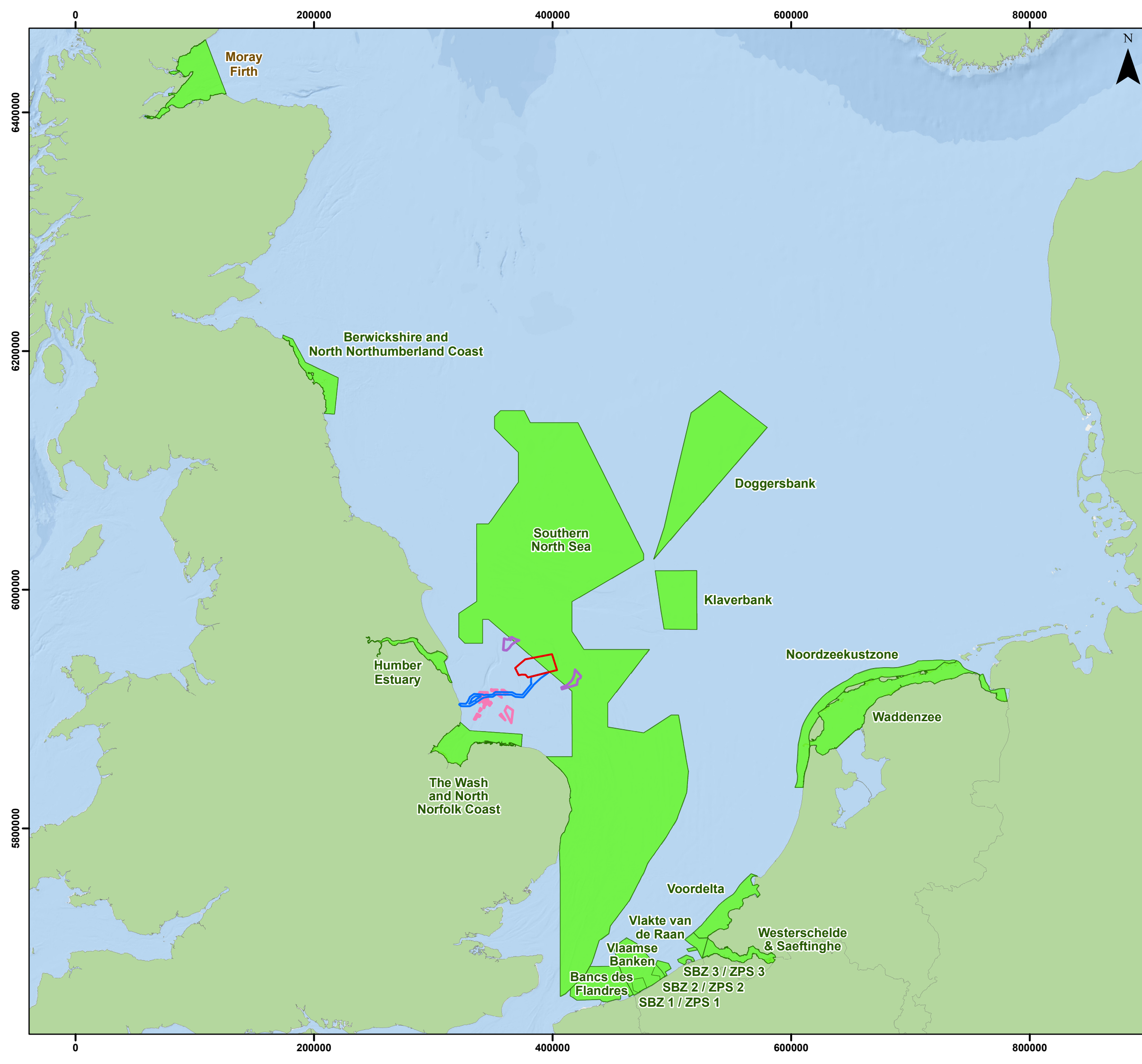
Table 5.4: Marine Mammal Site Screening

Designated Site		MU	Distance to Array (km)	Distance to ECC (km)	Distance to ANS (km)	Distance to biogenic reef (km)	Distance to ORCP (km)	Feature(s) to Consider for Potential LSE	Potential Effects Construction	Operation and Maintenance	Decommissioning	Potential for LSE
Southern Sea SAC	North	North Sea Harbour Porpoise MU	0.0	1.1	0.0	34.7	42.3	Harbour Porpoise ( <i>Phocoena phocoena</i> )	<ul style="list-style-type: none"> <li>Underwater noise;</li> <li>Vessel disturbance;</li> <li>Collision risk;</li> <li>Indirect pollution;</li> <li>Accidental pollution;</li> <li>Habitat loss; and</li> <li>Changes to prey.</li> </ul>	<ul style="list-style-type: none"> <li>Underwater noise;</li> <li>Vessel disturbance;</li> <li>Collision risk;</li> <li>Indirect Pollution;</li> <li>Accidental pollution;</li> <li>Habitat loss; and</li> <li>Changes to prey.</li> </ul>	<ul style="list-style-type: none"> <li>Underwater noise;</li> <li>Vessel disturbance;</li> <li>Collision risk;</li> <li>Indirect Pollution;</li> <li>Accidental pollution;</li> <li>Habitat loss; and</li> <li>Changes to prey.</li> </ul>	Potential for LSE. The site is within the maximum range for these effects as informed by modelling and <b>therefore there is a potential for an LSE.</b>
Humber Estuary SAC		Southeast England Seal MU	54.4	18.5	47.5	23.8	19.7	Grey Seal ( <i>Halichoerus grypus</i> )	<ul style="list-style-type: none"> <li>Underwater noise;</li> <li>Vessel disturbance;</li> <li>Changes to prey;</li> <li>Disturbance at haul out; and</li> <li>Collision risk.</li> </ul>	<ul style="list-style-type: none"> <li>Underwater noise</li> <li>Vessel disturbance;</li> <li>Changes to prey;</li> <li>Disturbance at haul out; and</li> <li>Collision risk.</li> </ul>	<ul style="list-style-type: none"> <li>Underwater noise;</li> <li>Vessel disturbance;</li> <li>Changes to prey;</li> <li>Disturbance at haul out; and</li> <li>Collision risk.</li> </ul>	The site is within the maximum range for these effects as informed by modelling and <b>therefore there is a potential for an LSE.</b>
									<ul style="list-style-type: none"> <li>Indirect pollution;</li> <li>Accidental pollution; and</li> <li>Habitat loss.</li> </ul>	<ul style="list-style-type: none"> <li>Indirect pollution</li> <li>Accidental pollution; and</li> <li>Habitat loss.</li> </ul>	<ul style="list-style-type: none"> <li>Accidental pollution;</li> <li>Indirect pollution; and</li> <li>Habitat loss.</li> </ul>	<b>No potential for LSE.</b> These effects have been screened out from assessment as a result of the distance between the Project and the designated site, the scale of the potential change and the scale and extent of alternative habitat.
Humber Ramsar	Estuary	Southeast England Seal MU	54.0	12.1	47.5	18.2	15.3	Grey Seal ( <i>Halichoerus grypus</i> )	<ul style="list-style-type: none"> <li>Underwater noise;</li> <li>Vessel disturbance;</li> <li>Changes to prey;</li> <li>Disturbance at haul out; and</li> <li>Collision risk.</li> </ul>	<ul style="list-style-type: none"> <li>Underwater noise;</li> <li>Vessel disturbance;</li> <li>Changes to prey;</li> <li>Disturbance at haul out; and</li> <li>Collision risk.</li> </ul>	<ul style="list-style-type: none"> <li>Underwater noise;</li> <li>Vessel disturbance;</li> <li>Changes to prey;</li> <li>Disturbance at haul out; and</li> <li>Collision risk.</li> </ul>	The site is within the maximum range for these effects as informed by modelling and <b>therefore there is a potential for an LSE.</b>
									<ul style="list-style-type: none"> <li>Indirect pollution;</li> <li>Accidental pollution; and</li> <li>Habitat loss.</li> </ul>	<ul style="list-style-type: none"> <li>Indirect pollution;</li> <li>Accidental pollution; and</li> <li>Habitat loss.</li> </ul>	<ul style="list-style-type: none"> <li>Accidental pollution;</li> <li>Indirect pollution; and</li> <li>Habitat loss.</li> </ul>	<b>No potential for LSE.</b> These effects have been screened out from assessment as a result of the distance between the Project and the designated site, the scale of the potential change and the scale

Designated Site	MU	Distance to Array (km)	Distance to ECC (km)	Distance to ANS (km)	Distance to biogenic reef (km)	Distance to ORCP (km)	Feature(s) to Consider for Potential LSE	Potential Effects			Potential for LSE
								Construction	Operation and Maintenance	Decommissioning	
The Wash and North Norfolk Coast SAC	Southeast England Seal MU	48.4	13.4	50.4	0.0	19.3	Harbour Seal ( <i>Phoca vitulina</i> )	<ul style="list-style-type: none"> <li>Underwater noise;</li> <li>Vessel disturbance;</li> <li>Changes to prey; and</li> <li>Collision risk.</li> </ul>	<ul style="list-style-type: none"> <li>Underwater noise;</li> <li>Vessel disturbance;</li> <li>Changes to prey; and</li> <li>Collision risk.</li> </ul>	<ul style="list-style-type: none"> <li>Underwater noise;</li> <li>Vessel disturbance;</li> <li>Changes to prey; and</li> <li>Collision risk.</li> </ul>	and extent of alternative habitat. The site is within the maximum range for these effects as informed by modelling (Document reference 6.3.3.2) and <b>therefore there is a potential for an LSE.</b>
								<ul style="list-style-type: none"> <li>Indirect pollution;</li> <li>Accidental pollution;</li> <li>Habitat loss; and</li> <li>Disturbance at haul out.</li> </ul>	<ul style="list-style-type: none"> <li>Indirect pollution</li> <li>Accidental pollution;</li> <li>Habitat loss; and</li> <li>Disturbance at haul out.</li> </ul>	<ul style="list-style-type: none"> <li>Accidental pollution;</li> <li>Indirect pollution;</li> <li>Habitat loss; and</li> <li>Disturbance at haul out.</li> </ul>	<b>No potential for LSE.</b> These effects have been screened out from assessment as a result of the distance between the Project and the designated site, the scale of the potential change and the scale and extent of alternative habitat.
Berwickshire and North Northumberland Coast SAC	Northeast England MU	260.4	262.0	232.6	259.2	262.0	Grey Seal ( <i>Halichoerus grypus</i> )	<ul style="list-style-type: none"> <li>Underwater noise;</li> <li>Vessel disturbance;</li> <li>Changes to prey; and</li> <li>Collision risk.</li> </ul>	<ul style="list-style-type: none"> <li>Underwater noise;</li> <li>Vessel disturbance;</li> <li>Changes to prey; and</li> <li>Collision risk.</li> </ul>	<ul style="list-style-type: none"> <li>Underwater noise;</li> <li>Vessel disturbance;</li> <li>Changes to prey; and</li> <li>Collision risk.</li> </ul>	The site is within the maximum range for these effects as informed by modelling (Document reference 6.3.3.2) and <b>therefore there is a potential for an LSE.</b>
								<ul style="list-style-type: none"> <li>Indirect pollution;</li> <li>Accidental pollution;</li> <li>Habitat loss; and</li> <li>Disturbance at haul out.</li> </ul>	<ul style="list-style-type: none"> <li>Indirect pollution</li> <li>Accidental pollution;</li> <li>Habitat loss; and</li> <li>Disturbance at haul out.</li> </ul>	<ul style="list-style-type: none"> <li>Accidental pollution;</li> <li>Indirect pollution;</li> <li>Habitat loss; and</li> <li>Disturbance at haul out.</li> </ul>	<b>No potential for LSE.</b> These effects have been screened out from assessment as a result of the distance between the Project and the designated site, the scale of the potential change and the scale and extent of alternative habitat.
Moray Firth SAC	Coastal East	515.0	525.5	487.0	521.2	525.5	Bottlenose dolphin	<ul style="list-style-type: none"> <li>Underwater noise;</li> <li>Vessel disturbance;</li> </ul>	<ul style="list-style-type: none"> <li>Underwater noise;</li> <li>Vessel disturbance;</li> </ul>	<ul style="list-style-type: none"> <li>Underwater noise;</li> <li>Vessel disturbance;</li> </ul>	Potential for site connectivity is indicated from photo-

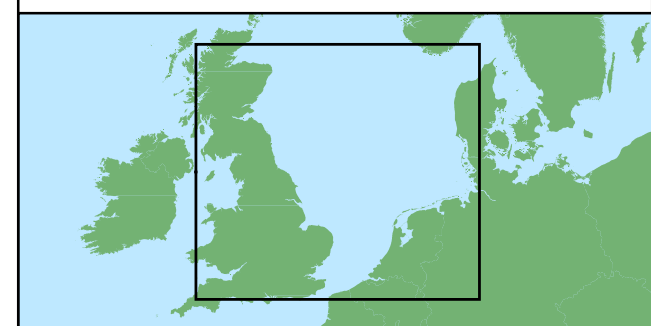
Designated Site	MU	Distance to Array (km)	Distance to ECC (km)	Distance to ANS (km)	Distance to biogenic reef (km)	Distance to ORCP (km)	Feature(s) to Consider for Potential LSE	Potential Effects			Potential for LSE
								Construction	Operation and Maintenance	Decommissioning	
	Scotland MU							<ul style="list-style-type: none"> <li>Collision risk; and</li> <li>Changes to prey.</li> </ul>	<ul style="list-style-type: none"> <li>Collision risk; and</li> <li>Changes to prey.</li> </ul>	<ul style="list-style-type: none"> <li>Collision risk; and</li> <li>Changes to prey.</li> </ul>	<p>identification data. <b>Therefore, there is the potential for some level of interaction and therefore LSE</b> between bottlenose dolphin associated with the Moray Firth SAC and these effects from the project.</p>
								<ul style="list-style-type: none"> <li>Accidental pollution;</li> <li>Indirect pollution; and</li> <li>Habitat loss.</li> </ul>	<ul style="list-style-type: none"> <li>Accidental pollution;</li> <li>Indirect pollution; and</li> <li>Habitat loss.</li> </ul>	<ul style="list-style-type: none"> <li>Accidental pollution;</li> <li>Indirect pollution; and</li> <li>Habitat loss.</li> </ul>	<p><b>No potential for LSE.</b> These effects have been screened out from assessment as a result of the distance between the Project and the designated site, the scale of the potential change and the scale and extent of alternative habitat.</p>
Transboundary sites for Harbour porpoise; Bancs des Flandres SCA; Doggersbank (Netherlands) SAC; Klaverbak SCI; Noordzeekustone SCI; SBZ 1 SCI; SBZ 2 SCI; SBZ 3 SCI; Vlaamse Banked SCI; Vlake van de Raan SCI; Voordelta SCI; Waddenzee SCI; and	Various	Various	Various	Various	Various	Various	Harbour porpoise	<ul style="list-style-type: none"> <li>Underwater noise;</li> <li>Vessel disturbance;</li> <li>Collision risk;</li> <li>Indirect pollution;</li> <li>Accidental pollution;</li> <li>Habitat loss; and</li> <li>Changes to prey.</li> </ul>	<ul style="list-style-type: none"> <li>Underwater noise;</li> <li>Vessel disturbance;</li> <li>Collision risk;</li> <li>Indirect pollution;</li> <li>Accidental pollution;</li> <li>Habitat loss; and</li> <li>Changes to prey.</li> </ul>	<ul style="list-style-type: none"> <li>Underwater noise;</li> <li>Vessel disturbance;</li> <li>Collision risk;</li> <li>Indirect pollution;</li> <li>Accidental pollution; and</li> <li>Changes to prey.</li> </ul>	<p><b>No potential for LSE.</b> The sites have been screened out based on a lack of evidence to suggest connectivity (no site within 26km of the Project).</p>

Designated Site	MU	Distance to Array (km)	Distance to ECC (km)	Distance to ANS (km)	Distance to biogenic reef (km)	Distance to ORCP (km)	Feature(s) to Consider for Potential LSE	Potential Effects Construction	Operation and Maintenance	Decommissioning	Potential for LSE
Westerschelde & Saefthinghe SCI.											
Transboundary sites for seals; Bancs des Flandres SAC; Doggersbank (Netherlands) SAC; Klaverbak SCI; Noordzeekustone SCI; SBZ 1 SCI; SBZ 2 SCI; SBZ 3 SCI; Vlaamse Banked SCI; Vlakte van de Raan SCI; Voordelta SCI; Waddenzee SCI; and Westerschelde & Saefthinghe SCI.	Various	Various	Various	Various	Various	Various	Harbour seal; and Grey seal	<ul style="list-style-type: none"> <li>Underwater noise;</li> <li>Vessel disturbance;</li> <li>Changes to prey; and</li> <li>Collision risk.</li> </ul>	<ul style="list-style-type: none"> <li>Underwater noise;</li> <li>Vessel disturbance;</li> <li>Changes to prey; and</li> <li>Collision risk.</li> </ul>	<ul style="list-style-type: none"> <li>Underwater noise;</li> <li>Vessel disturbance;</li> <li>Changes to prey; and</li> <li>Collision risk.</li> </ul>	The sites are within the maximum range for these effects as informed by modelling and <b>therefore there is a potential for an LSE.</b>
								<ul style="list-style-type: none"> <li>Indirect pollution;</li> <li>Accidental pollution;</li> <li>Habitat loss; and</li> <li>Disturbance at haul out.</li> </ul>	<ul style="list-style-type: none"> <li>Indirect pollution</li> <li>Accidental pollution;</li> <li>Habitat loss; and</li> <li>Disturbance at haul out.</li> </ul>	<ul style="list-style-type: none"> <li>Accidental pollution;</li> <li>Indirect pollution;</li> <li>Habitat loss; and</li> <li>Disturbance at haul out.</li> </ul>	<b>No potential for LSE.</b> These effects have been screened out from assessment as a result of the distance between the Project and the designated site, the scale of the potential change and the scale and extent of alternative habitat.



**Legend**

- Array Area
- Offshore Export Cable Corridor
- Artificial Nesting Structure Area
- Biogenic Reef Restoration Area
- SAC / SCI



Coordinate System: WGS 1984 UTM Zone 31N

0 100 200 km

Scale: 1:3,000,000

A3 Page Size

Environmental Statement

Designated Sites with a Potential for LSE for Marine Mammal Receptors

Figure 5.2



Date: 13/02/2024  
 Produced By: BPHB  
 Revision: 0.1

**GoBe**

Contains ESRI Basemapping; Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

Document Path: Z:\GIS\GIS - Projects\0152 Outer Dowsing EIA\GIS\Figures\ES\HRA Screening\ODOW\_0152\_HRA\_Fig 5.2 Marine Mammals SAC\_SCI.mxd



## 5.4 Offshore and Intertidal Ornithology Screening

111. Table 5.6 presents the potential activities and resulting effects considered following the criteria established in Table 4.2 for offshore and intertidal ornithological features. Stage 1 Screening (as presented in Table 5.6) determines the potential for a pathway to exist between the Project and each designated site identified through the initial site selection process during construction, operation and maintenance and decommissioning. The screening process primarily considers the breeding and non-breeding season connectivity for seabird species and additionally considers the waterbird features of designated sites with direct overlap with the Project or where there is potential for migratory waterbird collision risk impact using migratory pathways provided in Wright *et al.* (2012). For most designated sites, where the potential for a pathway exists, the potential for LSE is concluded. However, for those sites that are a considerable distance away, a screening conclusion is presented based on logic and reasoned expert opinion.

112. Additionally, during site selection, several transboundary sites were identified as having features that met Criteria 2 (having designated seabird features that are within MMF+1SD of the Project). However, due to the distance of these sites from the Project, no LSE is determined for all transboundary sites. Screening for Criteria 2 is based on the distance birds would fly based on travelling around major land masses as it is unlikely that birds would travel across land to forage offshore, thus all west coast SPAs have been screened out as the flight distance from those colonies would be very large (as not on a straight-line distance).

**Table 5.5: Offshore and Intertidal Ornithology Receptor Group Potential Effects**

Potential Effect	Activities Potentially Resulting in Effect		
	Construction	Operation and Maintenance	Decommissioning
Direct disturbance and displacement due to work activity and vessel movements in both the offshore and intertidal zones.	<ul style="list-style-type: none"> <li>▪ Vessel movements;</li> <li>▪ Construction of cable corridor;</li> <li>▪ Construction of the array; and</li> <li>▪ Construction of other infrastructure including ANSs;</li> <li>▪ Any in-combination effects identified.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Maintenance/ crew vessel movements;</li> <li>▪ Maintenance activities; and</li> <li>▪ Any in-combination effects identified.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Vessel movements;</li> <li>▪ Decommissioning vessel noise;</li> <li>▪ Decommissioning of the array and other infrastructure; and</li> <li>▪ Any in-combination effects identified.</li> </ul>
Direct disturbance and displacement due to the presence of turbines.	<ul style="list-style-type: none"> <li>▪ Physical presence of turbines; and</li> <li>▪ Any in-combination effects identified.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Physical presence of turbines; and</li> <li>▪ Any in-combination effects identified.</li> </ul>	<ul style="list-style-type: none"> <li>▪ N/A</li> </ul>

Potential Effect	Activities Potentially Resulting in Effect		
	Construction	Operation and Maintenance	Decommissioning
Collision risk due to the presence of turbines.	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>Physical presence of turbines; and</li> <li>Any in-combination effects identified.</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Barrier effects due to the presence of turbines.	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>Physical presence of turbines; and</li> <li>Any in-combination effects identified.</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Indirect impacts through effects on habitats and prey species.	<ul style="list-style-type: none"> <li>Changes in prey availability and behaviour; and</li> <li>Any in-combination effects identified.</li> </ul>	<ul style="list-style-type: none"> <li>Indirect impacts through effects on habitats and prey species; and</li> <li>Any in-combination effects identified.</li> </ul>	<ul style="list-style-type: none"> <li>Changes in prey availability and behaviour; and</li> <li>Any in-combination effects identified.</li> </ul>

113. Stage 1 Screening (as presented in Table 5.6) determines the potential for a pathway to exist between the Project and each designated site identified based on the screening ranges identified for impacts arising during construction, operation and maintenance and decommissioning. Where potential for an impact to impinge on the conservation objectives of a site is identified, potential for LSE is concluded. All sites where a potential for LSE has been concluded for offshore and intertidal ornithology receptors are depicted in Figure 5.3.
114. All transboundary sites have been considered up to a distance of 1000km from the Project array because this is beyond the MMF plus 1SD for almost all seabird species. Only sites with designated features for which a breeding season pathway was detected (i.e. within the MMF ranges plus 1SD of the Project) are presented in the screening table (Table 5.6).
115. For intertidal and migratory species, any impacts for features of SPAs greater than 100km of the site were screened out as it was considered that any apportioned impacts for these more distant SPAs will be minimal and insufficient to result in LSE. All tern species and little gull have been added to the table for sites beyond 100km where there is connectivity with breeding seabirds for the relevant SPA but are treated as migratory birds for the Project as they were mainly recorded in the survey area during migration periods. This screening approach for migratory features of distant SPAs has been advised by Natural England. Therefore, sites beyond 100km are not included in Table 5.6.
116. Key species with non-breeding season impacts have been screened in for all SPAs within the North Sea biologically defined minimum population scales (BDMPS) region (gannet, guillemot, razorbill, puffin, kittiwake). Tern species generally are not present within the array during the non-breeding season. Likewise, there was an extremely low abundance of herring gull and lesser black-backed gull within the array area during the non-breeding season and therefore non-breeding season impacts were screened out from further assessment.

Table 5.6: Offshore and Intertidal Ornithology Screening

Designated Site	Distance to Array (km)	Distance to the Project ECC (km)	Distance to the ANS (km)	Distance to the biogenic reef (km)	Distance to the ORCP (km)	Feature(s) to Consider for Potential LSE	Potential Effects			Potential for LSE
							Construction	Operation and Maintenance	Decommissioning	
Greater Wash SPA	24.6	0.0	24.0	0.0	0.0	<ul style="list-style-type: none"> <li>Common scoter;</li> <li>Red-throated diver.</li> </ul>	<ul style="list-style-type: none"> <li>Direct disturbance and displacement due to the presence of the array infrastructure, work activity and vessel movements in both the offshore and intertidal zones;</li> <li>Barrier effects for migratory waterbirds; and</li> <li>Collisions for migratory waterbirds.</li> </ul>	<p>The cable corridor directly overlaps with this SPA with red-throated diver and common scoter having high or very high vulnerability to disturbance/displacement from offshore windfarms and vessel disturbance. All other features have low vulnerability to disturbance and displacement (Bradbury <i>et al.</i>, 2014; Dierschke <i>et al.</i>, 2016; Fliessbach <i>et al.</i>, 2019). The pathway to insufficient prey resource is weak for all designated features. Temporary and low-impact effects are anticipated for local fish and benthic ecology. As such, there would be sufficient alternative resource available to support the species population. There is potential for migratory waterbirds to be impacted by the array through barrier effects and collisions.</p> <p><b>Therefore, LSE cannot be discounted in relation to all effects alone for any species.</b></p>		
						<ul style="list-style-type: none"> <li>Little gull;</li> <li>Little tern;</li> <li>Common tern; and</li> <li>Sandwich tern.</li> </ul>	<ul style="list-style-type: none"> <li>Collisions for migratory waterbirds</li> </ul>	<p>The Project array is beyond the mean-maximum +1SD foraging range (Woodward <i>et al.</i>, 2019) for all designated breeding seabird species and therefore has no breeding season connectivity. All species may be vulnerable to collisions for this site, but have low sensitivity. As agreed with Natural England, Sandwich tern has been screened out for displacement, and little gull and common tern have been assessed for migratory collision risk.</p>		
Humber Estuary Ramsar	54.0	12.1	47.5	18.2	15.3	<ul style="list-style-type: none"> <li>European golden plover;</li> <li>Red knot;</li> </ul>	<ul style="list-style-type: none"> <li>Barrier effects for migratory waterbirds; and</li> <li>Collisions for migratory waterbirds.</li> </ul>	<p>There is potential for migratory waterbirds to be impacted by the array through barrier effects and</p>		

Designated Site	Distance to Array (km)	Distance to the Project ECC (km)	Distance to the ANS (km)	Distance to the biogenic reef (km)	Distance to the ORCP (km)	Feature(s) to Consider for Potential LSE	Potential Effects			Potential for LSE
							Construction	Operation and Maintenance	Decommissioning	
						<ul style="list-style-type: none"> <li>▪ Dunlin;</li> <li>▪ Black-tailed godwit;</li> <li>▪ Common redshank;</li> <li>▪ Common shelduck; and</li> <li>▪ Bar-tailed godwit.</li> </ul>				<p>collisions. The pathway to insufficient prey resource is weak for all designated features. Temporary and low-impact effects are anticipated for local fish and benthic ecology. As such, there would be sufficient alternative resource available to support the species population.</p> <p>Wintering waterbirds are not prone to displacement impacts due to the distance from the ECC to the SPA exceeding 2km.</p> <p><b>Therefore, LSE cannot be discounted in relation to all effects alone.</b></p>
Humber Estuary SPA	54.0	12.1	47.5	18.2	15.3	<ul style="list-style-type: none"> <li>▪ Avocet;</li> <li>▪ Bar-tailed godwit;</li> <li>▪ Bittern;</li> <li>▪ Black-tailed godwit;</li> <li>▪ Dunlin;</li> <li>▪ Golden plover;</li> <li>▪ Hen harrier;</li> <li>▪ Knot;</li> <li>▪ Little tern;</li> <li>▪ Marsh harrier;</li> <li>▪ Redshank; Ruff;</li> <li>▪ Shelduck;</li> <li>▪ Pink-footed goose;</li> <li>▪ Wigeon;</li> <li>▪ Ringed plover;</li> <li>▪ Curlew;</li> <li>▪ Sanderling;</li> <li>▪ Oystercatcher;</li> <li>▪ Dark-bellied brent goose;</li> <li>▪ Mallard;</li> <li>▪ Pochard;</li> <li>▪ Goldeneye; and</li> <li>▪ Scaup.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Barrier effects for migratory waterbirds; and</li> <li>▪ Collisions for migratory waterbirds.</li> </ul>		<p>There is potential for migratory waterbirds to be impacted by the array through barrier effects and collisions. The pathway to insufficient prey resource is weak for all designated features. Temporary and low-impact effects are anticipated for local fish and benthic ecology. As such, there would be sufficient alternative resource available to support the species population.</p> <p>Wintering waterbirds are not prone to displacement impacts due to the distance from the ECC to the SPA exceeding 2km.</p> <p><b>Therefore, LSE cannot be discounted in relation to all effects alone.</b></p>	

Designated Site	Distance to Array (km)	Distance to the Project ECC (km)	Distance to the ANS (km)	Distance to the biogenic reef (km)	Distance to the ORCP (km)	Feature(s) to Consider for Potential LSE	Potential Effects		Potential for LSE
							Construction	Operation and Decommissioning Maintenance	
North Norfolk Coast SPA	57.2	29.9	59.0	10.8	31.4	<ul style="list-style-type: none"> <li>▪ Dark-bellied brent goose;</li> <li>▪ Eurasian marsh harrier;</li> <li>▪ Eurasian wigeon;</li> <li>▪ Great bittern;</li> <li>▪ Pied avocet;</li> <li>▪ Pink-footed goose;</li> <li>▪ Red knot;</li> <li>▪ Sandwich tern;</li> <li>▪ Common tern;</li> <li>▪ Little tern Assemblage features.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Barrier effects for migratory waterbirds; and</li> <li>▪ Collisions for migratory waterbirds.</li> </ul>	<p>The Project array is beyond the mean-maximum +1SD foraging ranges (Woodward <i>et al.</i>, 2019) for designated seabird species and therefore has no breeding season connectivity. There is potential for migratory waterbirds to be impacted by the array through barrier effects and collisions.</p> <p>The maximum site-specific foraging range for Sandwich tern from this site is 54km (Woodward <i>et al.</i>, 2019), therefore the Project is beyond the range of this species from this location. As agreed with Natural England, Sandwich tern has been screened out for displacement effects and screened in for collision risk. Wintering waterbirds are not prone to displacement impacts due to the distance from the ECC to the SPA exceeding 2km.</p> <p><b>Therefore, LSE cannot be discounted in relation to all effects alone.</b></p>	
Gibraltar Point Ramsar	63.1	13.3	70.5	1.6	19.3	<ul style="list-style-type: none"> <li>▪ Grey plover;</li> <li>▪ Sanderling;</li> <li>▪ Dark-bellied brent goose; and</li> <li>▪ Bar-tailed godwit.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Barrier effects for migratory waterbirds; and</li> <li>▪ Collisions for migratory waterbirds.</li> </ul>	<p>Wintering waterbirds are not prone to displacement impacts due to the distance from the ECC to the SPA exceeding 2km. Therefore, LSE can be discounted in relation to these effects alone.</p> <p>There is potential for migratory waterbirds to be impacted by the array through barrier effects and collisions.</p> <p><b>Therefore, LSE cannot be discounted in relation to all effects alone.</b></p>	
Gibraltar Point SPA	63.1	13.3	70.5	1.6	19.3	<ul style="list-style-type: none"> <li>▪ Bar-tailed godwit;</li> <li>▪ Grey plover; and</li> <li>▪ Sanderling</li> <li>▪ Little tern.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Barrier effects for migratory waterbirds; and</li> <li>▪ Collisions for migratory waterbirds.</li> </ul>	<p>Wintering waterbirds are not prone to displacement impacts due to the distance from the ECC to the SPA exceeding 2km. Therefore, LSE can be discounted in relation to these effects</p>	

Designated Site	Distance to Array (km)	Distance to the Project ECC (km)	Distance to the ANS (km)	Distance to the biogenic reef (km)	Distance to the ORCP (km)	Feature(s) to Consider for Potential LSE	Potential Effects		Potential for LSE
							Construction	Operation and Maintenance Decommissioning	
									alone. There is potential for migratory waterbirds and seabirds to be impacted by the array through barrier effects and collisions. <b>Therefore, LSE cannot be discounted in relation to all effects alone.</b>
The Wash Ramsar	66.5	16.4	74.0	3.8	22.7	<ul style="list-style-type: none"> <li>▪ Eurasian oystercatcher;</li> <li>▪ Grey plover;</li> <li>▪ Red knot;</li> <li>▪ Sanderling;</li> <li>▪ Eurasian curlew;</li> <li>▪ Common redshank;</li> <li>▪ Ruddy turnstone;</li> <li>▪ Pink-footed goose;</li> <li>▪ Dark-bellied brent goose;</li> <li>▪ Common shelduck;</li> <li>▪ Northern pintail;</li> <li>▪ Dunlin; and</li> <li>▪ Bar-tailed godwit.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Barrier effects for migratory waterbirds; and</li> <li>▪ Collisions for migratory waterbirds.</li> </ul>	<p>Wintering waterbirds are not prone to displacement impacts due to the distance from the ECC to the SPA exceeding 2km. Therefore, LSE can be discounted in relation to these effects alone. There is potential for migratory waterbirds and seabirds to be impacted by the array through barrier effects and collisions.</p> <p><b>Therefore, LSE cannot be discounted in relation to all effects alone.</b></p>	
The Wash SPA	66.5	16.4	74.0	3.8	22.7	<ul style="list-style-type: none"> <li>▪ Bar-tailed godwit;</li> <li>▪ Common scoter;</li> <li>▪ Black-tailed godwit;</li> <li>▪ Common goldeneye;</li> <li>▪ Common redshank;</li> <li>▪ Common shelduck;</li> <li>▪ Dark-bellied brent goose;</li> <li>▪ Dunlin;</li> <li>▪ Eurasian curlew;</li> <li>▪ Eurasian oystercatcher;</li> <li>▪ Eurasian wigeon;</li> <li>▪ Gadwall;</li> </ul>	<ul style="list-style-type: none"> <li>▪ Barrier effects for migratory waterbirds; and</li> <li>▪ Collisions for migratory waterbirds.</li> </ul>	<p>The Project array is beyond the mean-maximum +1SD foraging ranges (Woodward <i>et al.</i>, 2019) for designated seabird species and therefore has no breeding season connectivity. Wintering waterbirds are not prone to displacement impacts due to the distance from the ECC to the SPA exceeding 2km. Therefore, LSE can be discounted in relation to these effects alone. There is potential for migratory waterbirds and seabirds to be impacted by the array through barrier effects and collisions.</p>	

Designated Site	Distance to Array (km)	Distance to the Project ECC (km)	Distance to the ANS (km)	Distance to the biogenic reef (km)	Distance to the ORCP (km)	Feature(s) to Consider for Potential LSE	Potential Effects			Potential for LSE
							Construction	Operation and Maintenance	Decommissioning	
						<ul style="list-style-type: none"> <li>Grey plover;</li> <li>Northern pintail;</li> <li>Pink-footed goose;</li> <li>Red knot;</li> <li>Ruddy turnstone;</li> <li>Sanderling;</li> <li>Tundra swan;</li> <li>Common tern</li> <li>Little tern; and</li> <li>Assemblage features.</li> </ul>				<b>Therefore, LSE cannot be discounted in relation to all effects alone.</b>
Great Yarmouth North Denes SPA	84.5	71.3	69.8	58.6	93.8	<ul style="list-style-type: none"> <li>Little tern.</li> </ul>	<ul style="list-style-type: none"> <li>All impacts screened out.</li> </ul>			The Project array is beyond the mean-maximum +1SD foraging ranges (Woodward <i>et al.</i> , 2019) for designated seabird species and therefore has no breeding season connectivity. Migrations of birds from this SPA/ Ramsar are highly unlikely to result in birds passing through the site because it is south of the array. <b>Therefore, LSE can be discounted in relation to all effects alone.</b>
Flamborough and Filey Coast SPA	93.5	92.0	70.4	88.8	92.0	<ul style="list-style-type: none"> <li>Kittiwake</li> <li>Gannet; and</li> <li>Herring gull.</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>Collision risk due to the presence of turbines.</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>	The Project array is within the mean-maximum +1SD foraging ranges (Woodward <i>et al.</i> , 2019) for designated seabird species and therefore, has breeding season connectivity. Certain designated features (kittiwake and gannet) have high or very high vulnerability to collision risk with turbines (Bradbury <i>et al.</i> , 2014). Therefore, there is a potential for LSE. Outside the breeding season, impacts have been assessed against BDMPS. <b>Therefore, LSE cannot be discounted in relation to all effects alone.</b>
						<ul style="list-style-type: none"> <li>Guillemot;</li> <li>Razorbill;</li> <li>Gannet; and</li> </ul>	<ul style="list-style-type: none"> <li>Direct disturbance and displacement due to the presence of the array infrastructure, work activity</li> </ul>			The Project array is within the mean-maximum +1SD foraging ranges (Woodward <i>et al.</i> , 2019) for

Designated Site	Distance to Array (km)	Distance to the Project ECC (km)	Distance to the ANS (km)	Distance to the biogenic reef (km)	Distance to the ORCP (km)	Feature(s) to Consider for Potential LSE	Potential Effects			Potential for LSE
							Construction	Operation and Maintenance	Decommissioning	
						<ul style="list-style-type: none"> <li>Puffin.</li> </ul>	and vessel movements in both the offshore and intertidal zones.			designated seabird species and therefore, has breeding season connectivity. Certain designated features have high or very high vulnerability to displacement from offshore windfarms (Bradbury <i>et al.</i> , 2014; Dierschke <i>et al.</i> , 2016). Therefore, there is a potential for LSE. Therefore, guillemot, razorbill, gannet and puffin have potential LSE for disturbance and displacement impacts during all phases. Outside the breeding season, impacts have been assessed against BDMPS. <b>Therefore, LSE cannot be discounted in relation to all effects alone.</b>
						<ul style="list-style-type: none"> <li>Fulmar;</li> <li>European shag; and</li> <li>Cormorant.</li> </ul>	All impacts screened out.			
Outer Thames Estuary SPA	97.8	84.8	82.4	69.7	104.0	<ul style="list-style-type: none"> <li>Common tern;</li> <li>Little tern; and</li> <li>Red-throated diver.</li> </ul>	All impacts screened out.			The Project array is beyond the mean-maximum +1SD foraging ranges (Woodward <i>et al.</i> , 2019) for designated seabird species and therefore has no breeding season connectivity. It is also beyond the disturbance ranges for divers from this SPA. Migrations of birds from this SPA/ Ramsar are likely to result in negligible numbers passing through the site. <b>Therefore, LSE can be discounted in relation to all effects alone.</b>
Alde-Ore Estuary SPA and Ramsar	147.4	131.3	136.2	110.4	139.2	<ul style="list-style-type: none"> <li>Lesser black-backed gull.</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>Collision risk due to the presence of turbines.</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>	On the advice of Natural England, potential for LSE on Lesser black-backed gull due to collisions is screened in.



Designated Site	Distance to Array (km)	Distance to the Project ECC (km)	Distance to the ANS (km)	Distance to the biogenic reef (km)	Distance to the ORCP (km)	Feature(s) to Consider for Potential LSE	Potential Effects			Potential for LSE
							Construction	Operation and Maintenance	Decommissioning	
										Outside the breeding season, impacts have been assessed against BDMPS. <b>Therefore, LSE cannot be discounted in relation to all effects alone.</b>
						<ul style="list-style-type: none"> <li>Little tern;</li> <li>Sandwich tern;</li> <li>Ruff;</li> <li>Pied avocet; and</li> <li>Common redshank.</li> </ul>	<ul style="list-style-type: none"> <li>All impacts screened out.</li> </ul>			The Project array is beyond the site-specific mean-maximum +1SD foraging ranges (Woodward <i>et al.</i> , 2019) for designated seabird species and therefore has no breeding season connectivity. Migrating birds are highly unlikely to pass through the array on migration. <b>Therefore, LSE can be discounted in relation to all effects alone.</b>
Northumbria Coast SPA	198.6	193.2	173.6	191.9	193.2	<ul style="list-style-type: none"> <li>Arctic tern; and</li> <li>Little tern.</li> </ul>	<ul style="list-style-type: none"> <li>All impacts screened out.</li> </ul>			The Project array is beyond the mean-maximum +1SD foraging ranges (Woodward <i>et al.</i> , 2019) for designated seabird species and therefore has no breeding season connectivity. Migrations of birds from this SPA/ Ramsar are likely to result in negligible numbers passing through the site. <b>There is no potential for LSE. Therefore, LSE can be discounted in relation to all effects alone.</b>
Foulness (Mid-Essex Coast Phase 5) SPA	202.7	181.1	196.3	161.2	182.3	<ul style="list-style-type: none"> <li>Common tern;</li> <li>Little tern; and</li> <li>Sandwich tern.</li> </ul>	<ul style="list-style-type: none"> <li>All impacts screened out.</li> </ul>			The Project array is beyond the mean-maximum +1SD foraging ranges (Woodward <i>et al.</i> , 2019) for designated seabird species and therefore has no breeding season connectivity. Migrations of birds from this SPA/ Ramsar are likely to result in negligible numbers passing through the site. <b>Therefore, LSE can be discounted in relation to all effects alone.</b>
						<ul style="list-style-type: none"> <li>Common tern; and</li> <li>Little tern.</li> </ul>	<ul style="list-style-type: none"> <li>All impacts screened out.</li> </ul>			The Project array is beyond the mean-maximum +1SD foraging ranges (Woodward <i>et al.</i> , 2019) for designated seabird species and therefore has no breeding season

Designated Site	Distance to Array (km)	Distance to the Project ECC (km)	Distance to the ANS (km)	Distance to the biogenic reef (km)	Distance to the ORCP (km)	Feature(s) to Consider for Potential LSE	Potential Effects		Potential for LSE
							Construction	Operation and Maintenance Decommissioning	
									connectivity. Migrations of birds from this SPA/ Ramsar are likely to result in negligible numbers passing through the site. <b>Therefore, LSE can be discounted in relation to all effects alone.</b>
Thanet Coast and Sandwich Bay SPA	231.5	213.1	221.7	191.7	214.2	<ul style="list-style-type: none"> <li>Little tern.</li> </ul>	<ul style="list-style-type: none"> <li>All impacts screened out.</li> </ul>		The Project array is beyond the mean-maximum +1SD foraging ranges (Woodward <i>et al.</i> , 2019) for designated seabird species and therefore has no breeding season connectivity. Migrations of birds from this SPA/ Ramsar are likely to result in negligible numbers passing through the site. <b>Therefore, LSE can be discounted in relation to all effects alone.</b>
Northumberland Marine SPA	237.7	235.3	210.8	233.3	235.3	<ul style="list-style-type: none"> <li>Arctic tern;</li> <li>Common tern;</li> <li>Little tern;</li> <li>Roseate tern;</li> <li>Sandwich tern;</li> <li>Guillemot; and</li> <li>Puffin.</li> </ul>	<ul style="list-style-type: none"> <li>All impacts screened out.</li> </ul>		The Project array is beyond the mean-maximum +1SD foraging ranges (Woodward <i>et al.</i> , 2019) for designated seabird species and therefore has no breeding season connectivity. This is a marine SPA designated for foraging seabirds. Impacts from outside the SPA are considered to have no connectivity to the the site. <b>Therefore, LSE can be discounted in relation to all effects alone.</b>
Coquet Island SPA	258.6	258.8	231.0	256.3	258.8	<ul style="list-style-type: none"> <li>Puffin.</li> </ul>	<ul style="list-style-type: none"> <li>Direct disturbance and displacement due to the presence of the array infrastructure, work activity and vessel movements in both the offshore and intertidal zones.</li> </ul>		The Project array is within the mean-maximum +1SD foraging ranges (Woodward <i>et al.</i> , 2019) for designated seabird species and therefore, has breeding season connectivity. Certain designated features have high or very high vulnerability to displacement from offshore windfarms (Bradbury <i>et al.</i> , 2014; Dierschke <i>et al.</i> , 2016).

Designated Site	Distance to Array (km)	Distance to the Project ECC (km)	Distance to the ANS (km)	Distance to the biogenic reef (km)	Distance to the ORCP (km)	Feature(s) to Consider for Potential LSE	Potential Effects			Potential for LSE
							Construction	Operation and Maintenance	Decommissioning	
										Therefore, puffin have potential LSE for disturbance and displacement impacts during all phases.
						<ul style="list-style-type: none"> <li>Sandwich tern</li> </ul>		<ul style="list-style-type: none"> <li>Collision risk due to the presence of turbines.</li> </ul>		The Project array is beyond the mean-maximum +1SD foraging ranges (Woodward <i>et al.</i> , 2019) for designated seabird species and therefore has no breeding season connectivity. Migrations of sandwich terns in the non-breeding season are likely to result in negligible numbers passing through the site. <b>Therefore, Sandwich tern have potential LSE in relation due to collision impacts during O&amp;M.</b>
						<ul style="list-style-type: none"> <li>Roseate tern;</li> <li>Common tern;</li> <li>Arctic tern;</li> <li>Black-headed gull.</li> </ul>	<ul style="list-style-type: none"> <li>All impacts screened out.</li> </ul>			The Project array is beyond the mean-maximum +1SD foraging ranges (Woodward <i>et al.</i> , 2019) for designated seabird species and therefore has no breeding season connectivity. Migrations of birds from this SPA/ Ramsar are likely to result in negligible numbers passing through the site. <b>Therefore, LSE can be discounted in relation to all effects alone.</b>
Dungeness, Romney Marsh and Rye Bay SPA	269.6	246.7	262.5	227.2	248.2	<ul style="list-style-type: none"> <li>Common tern;</li> <li>Little tern; and</li> <li>Sandwich tern.</li> </ul>	<ul style="list-style-type: none"> <li>All impacts screened out.</li> </ul>			The Project array is beyond the mean-maximum +1SD foraging ranges (Woodward <i>et al.</i> , 2019) for designated seabird species and therefore has no breeding season connectivity. Migrations of birds from this SPA/Ramsar are likely to result in negligible numbers passing through the site. <b>Therefore, LSE can be discounted in relation to all effects alone.</b>
Farne Islands SPA	285.8	289.1	257.9	285.9	289.1	<ul style="list-style-type: none"> <li>Kittiwake</li> <li>Sandwich tern</li> </ul>		<ul style="list-style-type: none"> <li>Collision risk due to the</li> </ul>		The Project array is within the mean-maximum +1SD foraging ranges (Woodward <i>et al.</i> , 2019) for kittiwake and therefore has breeding season

Designated Site	Distance to Array (km)	Distance to the Project ECC (km)	Distance to the ANS (km)	Distance to the biogenic reef (km)	Distance to the ORCP (km)	Feature(s) to Consider for Potential LSE	Potential Effects		Potential for LSE
							Construction	Operation and Maintenance	
								presence of turbines.	connectivity. Both species have non-breeding season connectivity and have high or very high vulnerability to collision risk with turbines (Bradbury <i>et al.</i> , 2014). <b>Therefore, they have been screened into the assessment based on potential collision risk impacts.</b>
						<ul style="list-style-type: none"> <li>▪ Common guillemot</li> <li>▪ Puffin</li> </ul>		<ul style="list-style-type: none"> <li>▪ Direct disturbance and displacement due to the presence of the array infrastructure, work activity and vessel movements in both the offshore and intertidal zones in the non-breeding season.</li> </ul>	On the advice of Natural England, LSE cannot be discounted for displacement impacts on guillemot from this site, in the non-breeding season. Outside the breeding season, impacts have been assessed against BDMPS. <b>LSE can be discounted in relation to guillemot effects alone.</b>
Solent and Southampton Water SPA	328.8	282.0	339.1	267.7	289.0	<ul style="list-style-type: none"> <li>▪ Little tern;</li> <li>▪ Common tern;</li> <li>▪ Roseate tern;</li> <li>▪ Sandwich tern;</li> <li>▪ Mediterranean gull</li> <li>▪ Black-tailed godwit</li> <li>▪ Ringed plover</li> <li>▪ Eurasian teal</li> <li>▪ Dark-bellied brent goose</li> </ul>		<ul style="list-style-type: none"> <li>▪ All impacts screened out.</li> </ul>	The Project array is beyond the mean-maximum +1SD foraging ranges (Woodward <i>et al.</i> , 2019) for designated breeding seabird species and therefore has no breeding season connectivity. Migrations of seabirds and waterbirds from this SPA will not result in birds passing through the site. <b>Therefore, LSE can be discounted in relation to all effects alone.</b>
St Abb's Head to Fast Castle SPA	330.0	331.5	305.3	328.9	331.5	<ul style="list-style-type: none"> <li>▪ Guillemot; and</li> <li>▪ Razorbill</li> </ul>		<ul style="list-style-type: none"> <li>▪ Displacement.</li> </ul>	The Project array is beyond the mean-maximum +1SD foraging ranges (Woodward <i>et al.</i> , 2019) for designated seabird species and therefore has no breeding season connectivity. <b>Therefore, LSE can be discounted in relation to all effects alone in the breeding season. Outside the breeding season, impacts LSE cannot be discounted in relation to all effects alone.</b>

Designated Site	Distance to Array (km)	Distance to the Project ECC (km)	Distance to the ANS (km)	Distance to the biogenic reef (km)	Distance to the ORCP (km)	Feature(s) to Consider for Potential LSE	Potential Effects		Potential for LSE
							Construction	Operation and Maintenance	
						<ul style="list-style-type: none"> <li>Kittiwake</li> </ul>		<ul style="list-style-type: none"> <li>Collision risk due to the presence of turbines.</li> </ul>	<p>The Project array is within the mean-maximum +1SD foraging ranges (Woodward <i>et al.</i>, 2019) for kittiwake and therefore has breeding season connectivity. Both species have non-breeding season connectivity and have high or very high vulnerability to collision risk with turbines (Bradbury <i>et al.</i>, 2014).</p> <p><b>Therefore, they have been screened into the assessment based on potential collision risk impacts.</b></p>
Forth Islands SPA	363.7	363.4	335.9	361.2	363.4	<ul style="list-style-type: none"> <li>Lesser black-backed gull;</li> <li>Herring gull;</li> <li>European shag;</li> <li>Sandwich tern;</li> <li>Roseate tern;</li> <li>common tern; and</li> <li>Arctic tern</li> </ul>	<ul style="list-style-type: none"> <li>All impacts screened out.</li> </ul>		<p>The Project array is beyond the mean-maximum +1SD foraging ranges (Woodward <i>et al.</i>, 2019) for designated seabird species and therefore has no breeding season connectivity.</p> <p><b>Therefore, LSE can be discounted in relation to all effects alone.</b></p>
						<ul style="list-style-type: none"> <li>Guillemot;</li> <li>Razorbill;</li> <li>Puffin;</li> <li>Kittiwake; and</li> <li>Gannet.</li> </ul>	<ul style="list-style-type: none"> <li>Displacement; and</li> <li>Collision.</li> </ul>	<p>The Project array is beyond the mean-maximum +1SD foraging ranges (Woodward <i>et al.</i>, 2019) for designated seabird species and therefore has no breeding season connectivity.</p> <p><b>Therefore, LSE can be discounted in relation to all effects alone in the breeding season. Outside the breeding season, impacts LSE cannot be discounted in relation to all effects alone.</b></p>	
Poole Harbour SPA and Ramsar	371.7	321.8	381.1	309.6	329.9	<ul style="list-style-type: none"> <li>Common tern;</li> <li>Mediterranean gull; and</li> <li>Sandwich tern.</li> </ul>	<ul style="list-style-type: none"> <li>All impacts screened out.</li> </ul>		<p>The Project array is beyond the mean-maximum +1SD foraging ranges (Woodward <i>et al.</i>, 2019) for designated seabird species and therefore has no breeding season connectivity.</p>

Designated Site	Distance to Array (km)	Distance to the Project ECC (km)	Distance to the ANS (km)	Distance to the biogenic reef (km)	Distance to the ORCP (km)	Feature(s) to Consider for Potential LSE	Potential Effects		Potential for LSE
							Construction	Operation and Maintenance	
									Migrations of seabirds from this SPA will not result in birds passing through the site. <b>Therefore, LSE can be discounted in relation to all effects alone.</b>
Imperial Dock Lock, Leith SPA	382.8	378.1	355.8	377.3	378.4	<ul style="list-style-type: none"> <li>Common tern</li> </ul>	<ul style="list-style-type: none"> <li>All impacts screened out.</li> </ul>		The Project array is beyond the mean-maximum +1SD foraging ranges (Woodward <i>et al.</i> , 2019) for designated seabird species and therefore has no breeding season connectivity. Migrations of birds from this SPA/Ramsar are likely to result in negligible numbers passing through the site. <b>Therefore, LSE can be discounted in relation to all effects alone.</b>
Firth of Tay and Eden Estuary SPA	395.5	396.7	367.6	394.2	396.7	<ul style="list-style-type: none"> <li>Little tern.</li> </ul>	<ul style="list-style-type: none"> <li>All impacts screened out.</li> </ul>		The Project array is beyond the mean-maximum +1SD foraging ranges (Woodward <i>et al.</i> , 2019) for designated seabird species and therefore has no breeding season connectivity. Migrations of birds from this SPA/Ramsar are likely to result in negligible numbers passing through the site. <b>Therefore, LSE can be discounted in relation to all effects alone.</b>
Chesil Beach and The Fleet SPA	403.4	351.8	411.2	341.0	360.5	<ul style="list-style-type: none"> <li>Little tern.</li> </ul>	<ul style="list-style-type: none"> <li>All impacts screened out.</li> </ul>		The Project array is beyond the site-specific mean-maximum +1SD foraging ranges (Woodward <i>et al.</i> , 2019) for designated seabird species and therefore has no breeding season connectivity. Migrations of seabirds from this SPA will not result in birds passing through the site. <b>Therefore, LSE can be discounted in relation to all effects alone.</b>
Fowlsheugh SPA	421.5	430.9	393.4	426.7	430.9	<ul style="list-style-type: none"> <li>Herring gull.</li> </ul>	<ul style="list-style-type: none"> <li>All impacts screened out.</li> </ul>		The Project array is beyond the mean-maximum +1SD foraging ranges (Woodward <i>et al.</i> , 2019) for

Designated Site	Distance to Array (km)	Distance to the Project ECC (km)	Distance to the ANS (km)	Distance to the biogenic reef (km)	Distance to the ORCP (km)	Feature(s) to Consider for Potential LSE	Potential Effects		Potential for LSE
							Construction	Operation and Maintenance	
									designated seabird species and therefore has no breeding season connectivity. <b>Therefore, LSE can be discounted in relation to all effects alone.</b>
						<ul style="list-style-type: none"> <li>Guillemot;</li> <li>Razorbill; and</li> <li>Kittiwake.</li> </ul>	<ul style="list-style-type: none"> <li>Displacement; and</li> <li>Collision</li> </ul>		The Project array is beyond the mean-maximum +1SD foraging ranges (Woodward et al., 2019) for designated seabird species and therefore has no breeding season connectivity. <b>Therefore, LSE can be discounted in relation to all effects alone in the breeding season. Outside the breeding season, impacts LSE cannot be discounted in relation to all effects alone.</b>
Ythan Estuary and Meikle Loch SPA and Ramsar	456.4	469.2	428.5	464.3	469.2	<ul style="list-style-type: none"> <li>Common tern;</li> <li>Little tern; and</li> <li>Sandwich tern.</li> </ul>	<ul style="list-style-type: none"> <li>All impacts screened out.</li> </ul>		The Project array is beyond the mean-maximum +1SD foraging ranges (Woodward et al., 2019) for designated seabird species and therefore has no breeding season connectivity. Migrations of seabirds from this SPA will not result in birds passing through the site. <b>Therefore, LSE can be discounted in relation to all effects alone.</b>
Buchan Ness to Collieston Coast SPA	456.6	469.8	433.8	464.8	469.8	<ul style="list-style-type: none"> <li>Guillemot; and</li> <li>Kittiwake</li> </ul>	<ul style="list-style-type: none"> <li>Displacement; and</li> <li>Collision</li> </ul>		The Project array is beyond the mean-maximum +1SD foraging ranges (Woodward et al., 2019) for designated seabird species and therefore has no breeding season connectivity. <b>Therefore, LSE can be discounted in relation to all effects alone in the breeding season. Outside the breeding season, impacts LSE cannot be discounted in relation to all effects alone.</b>
Troup, Pennan and Lion's Heads SPA	498.4	511.7	470.5	506.8	511.7	<ul style="list-style-type: none"> <li>Kittiwake;</li> <li>Guillemot; and</li> </ul>	<ul style="list-style-type: none"> <li>Displacement; and</li> <li>Collision</li> </ul>		The Project array is beyond the mean-maximum +1SD foraging ranges for all

Designated Site	Distance to Array (km)	Distance to the Project ECC (km)	Distance to the ANS (km)	Distance to the biogenic reef (km)	Distance to the ORCP (km)	Feature(s) to Consider for Potential LSE	Potential Effects		Potential for LSE
							Construction	Operation and Maintenance	
						<ul style="list-style-type: none"> <li>Razorbill.</li> </ul>			<p>other designated seabird species (Woodward <i>et al.</i>, 2019) and therefore has no breeding season connectivity.</p> <p><b>Therefore, LSE can be discounted in relation to all effects alone in the breeding season. Outside the breeding season, impacts LSE cannot be discounted in relation to all effects alone.</b></p>
						<ul style="list-style-type: none"> <li>Fulmar; and</li> <li>Herring gull.</li> </ul>	<ul style="list-style-type: none"> <li>All impacts screened out.</li> </ul>		<p>Site has connectivity with breeding fulmar based on mean-maximum +1SD foraging range, however the significance of effects at a population level is considered to decrease exponentially with distance. Due to the large foraging range for this species, the likelihood and or severity of the effect experienced locally is considered negligible. In addition, this species has very low vulnerability to displacement and collision (Bradbury <i>et al.</i>, 2014).</p> <p>It is therefore determined that significant effects would not manifest on this distant SPA/ Ramsar after the likelihood and severity of effects on the SPA/Ramsar have been apportioned to all SPAs within the foraging range.</p> <p><b>Therefore, LSE can be discounted in relation to all effects alone.</b></p>
East Caithness Cliffs SPA	582.4	590.9	554.4	587.0	590.9	<ul style="list-style-type: none"> <li>Kittiwake;</li> <li>Guillemot; and</li> <li>Razorbill.</li> </ul>	<ul style="list-style-type: none"> <li>Displacement; and</li> <li>Collision</li> </ul>		<p>The Project array is beyond the mean-maximum +1SD foraging ranges for all other designated seabird species (Woodward <i>et al.</i>, 2019) and therefore has no breeding season connectivity.</p> <p><b>Therefore, LSE can be discounted in relation to all effects alone in the breeding season. Outside the</b></p>



Designated Site	Distance to Array (km)	Distance to the Project ECC (km)	Distance to the ANS (km)	Distance to the biogenic reef (km)	Distance to the ORCP (km)	Feature(s) to Consider for Potential LSE	Potential Effects		Potential for LSE
							Construction	Operation and Maintenance	
						<ul style="list-style-type: none"> <li>▪ Great black-backed gull;</li> <li>▪ Herring gull;</li> <li>▪ Fulmar;</li> <li>▪ European shag; and</li> <li>▪ Great cormorant.</li> </ul>	<ul style="list-style-type: none"> <li>▪ All impacts screened out.</li> </ul>	<p><b>breeding season, impacts LSE cannot be discounted in relation to all effects alone.</b></p> <p>Site has connectivity with breeding fulmar based on mean-maximum +1SD foraging range, however the significance of effects at a population level is considered to decrease exponentially with distance. Due to the large foraging range for this species, the likelihood and or severity of the effect experienced locally is considered negligible. In addition, this species has very low vulnerability to displacement and collision (Bradbury <i>et al.</i>, 2014).</p> <p>The Project array is beyond the site-specific mean-maximum +1SD foraging ranges (Woodward <i>et al.</i>, 2019) for remaining designated seabird species and therefore has no breeding season connectivity. During the non-breeding season birds from this SPA/ Ramsar are unlikely to passing through the site.</p> <p>It is therefore determined that significant effects would not manifest on this distant SPA/ Ramsar after the likelihood and severity of effects on the SPA/Ramsar have been apportioned to all SPAs within the foraging range.</p> <p><b>Therefore, LSE can be discounted in relation to all effects alone.</b></p>	
North Caithness Cliffs SPA	610.4	623.4	582.5	618.6	623.4	<ul style="list-style-type: none"> <li>▪ Fulmar</li> </ul>	<ul style="list-style-type: none"> <li>▪ All impacts screened out.</li> </ul>	<p>Site has connectivity with breeding fulmar based on mean-maximum +1SD foraging range, however the significance of effects at a population level is considered to decrease exponentially with distance. Due to the large foraging range for this</p>	

Designated Site	Distance to Array (km)	Distance to the Project ECC (km)	Distance to the ANS (km)	Distance to the biogenic reef (km)	Distance to the ORCP (km)	Feature(s) to Consider for Potential LSE	Potential Effects		Potential for LSE
							Construction	Operation and Maintenance	
									<p>species, the likelihood and or severity of the effect experienced locally is considered negligible. In addition, this species has very low vulnerability to displacement and collision (Bradbury <i>et al.</i>, 2014).</p> <p>It is therefore determined that significant effects would not manifest on this distant SPA/ Ramsar after the likelihood and severity of effects on the SPA/Ramsar have been apportioned to all SPAs within the foraging range.</p> <p><b>Therefore, LSE can be discounted in relation to all effects alone.</b></p>
						<ul style="list-style-type: none"> <li>▪ Kittiwake;</li> <li>▪ Guillemot;</li> <li>▪ Razorbill; and</li> <li>▪ Puffin</li> </ul>	<ul style="list-style-type: none"> <li>▪ Displacement, and</li> <li>▪ Collision.</li> </ul>		<p>The Project array is beyond the mean-maximum +1SD foraging ranges (Woodward <i>et al.</i>, 2019) for designated seabird species and therefore has no breeding season connectivity.</p> <p><b>Therefore, LSE can be discounted in relation to all effects alone in the breeding season. Outside the breeding season, impacts LSE cannot be discounted in relation to all effects alone.</b></p>
Pentland Firth Islands SPA	618.9	632.7	591.1	627.7	632.7	<ul style="list-style-type: none"> <li>▪ Arctic tern</li> </ul>	<ul style="list-style-type: none"> <li>▪ All impacts screened out.</li> </ul>		<p>The Project array is beyond the mean-maximum +1SD foraging ranges (Woodward <i>et al.</i>, 2019) for designated seabird species and therefore has no breeding season connectivity. Migrations of seabirds from this SPA will not result in birds passing through the site.</p> <p><b>Therefore, LSE can be discounted in relation to all effects alone.</b></p>
Copinsay SPA	630.9	646.2	608.8	641.2	646.6	<ul style="list-style-type: none"> <li>▪ Guillemot; and</li> <li>▪ Kittiwake</li> </ul>	<ul style="list-style-type: none"> <li>▪ Displacement; and</li> <li>▪ Collision</li> </ul>		<p>The Project array is beyond the mean-maximum +1SD foraging ranges (Woodward <i>et al.</i>, 2019) for designated seabird species and</p>

Designated Site	Distance to Array (km)	Distance to the Project ECC (km)	Distance to the ANS (km)	Distance to the biogenic reef (km)	Distance to the ORCP (km)	Feature(s) to Consider for Potential LSE	Potential Effects		Potential for LSE
							Construction	Operation and Maintenance	
									therefore has no breeding season connectivity. <b>Therefore, LSE can be discounted in relation to all effects alone in the breeding season. Outside the breeding season, impacts LSE cannot be discounted in relation to all effects alone.</b>
Hoy SPA	634.8	647.5	607.0	642.8	647.5	<ul style="list-style-type: none"> <li>Arctic skua;</li> <li>Peregrine falcon;</li> <li>Red-throated diver;</li> <li>Great skua;</li> <li>Great black-backed gull; and</li> <li>Fulmar.</li> </ul>	<ul style="list-style-type: none"> <li>All impacts screened out.</li> </ul>	<p>The Project array is beyond the mean-maximum +1SD foraging ranges (Woodward <i>et al.</i>, 2019) for designated seabird species and therefore has no breeding season connectivity, or species has a very low vulnerability to displacement and collision (Bradbury <i>et al.</i>, 2014). Migrations of birds from this SPA/Ramsar are likely to result in negligible numbers passing through the site. Therefore, LSE can be discounted in relation to all effects alone. <b>Therefore, LSE can be discounted in relation to all effects alone.</b></p>	
						<ul style="list-style-type: none"> <li>Kittiwake</li> <li>Guillemot; and</li> <li>Puffin</li> </ul>	<ul style="list-style-type: none"> <li>Displacement</li> </ul>		<p>The Project array is beyond the mean-maximum +1SD foraging ranges (Woodward <i>et al.</i>, 2019) for designated seabird species and therefore has no breeding season connectivity. <b>Therefore, LSE can be discounted in relation to all effects alone in the breeding season. Outside the breeding season, impacts LSE cannot be discounted in relation to all effects alone.</b></p>
Calf of Eday SPA	667.1	682.4	645.2	678.0	683.5	<ul style="list-style-type: none"> <li>Guillemot; and</li> <li>Kittiwake</li> </ul>	<ul style="list-style-type: none"> <li>Displacement; and</li> <li>Collision</li> </ul>	<p>The Project array is beyond the mean-maximum +1SD foraging ranges (Woodward <i>et al.</i>, 2019) for designated seabird species and therefore has no breeding season connectivity.</p>	

Designated Site	Distance to Array (km)	Distance to the Project ECC (km)	Distance to the ANS (km)		Distance to the biogenic reef (km)	Distance to the ORCP (km)	Feature(s) to Consider for Potential LSE	Potential Effects		Potential for LSE
			Construction	Operation and Maintenance				Decommissioning		
										Therefore, LSE can be discounted in relation to all effects alone in the breeding season. Outside the breeding season, impacts LSE cannot be discounted in relation to all effects alone.
Rousay SPA	668.0	683.2	645.8		677.9	683.2	<ul style="list-style-type: none"> <li>Guillemot; and</li> <li>Kittiwake</li> </ul>	<ul style="list-style-type: none"> <li>Displacement; and</li> <li>Collision</li> </ul>		<p>The Project array is beyond the mean-maximum +1SD foraging ranges (Woodward <i>et al.</i>, 2019) for designated seabird species and therefore has no breeding season connectivity.</p> <p>Therefore, LSE can be discounted in relation to all effects alone in the breeding season. Outside the breeding season, impacts LSE cannot be discounted in relation to all effects alone.</p>
Marwick Head SPA	670.4	683.9	642.6	679.0	683.9	<ul style="list-style-type: none"> <li>Kittiwake; and</li> <li>Guillemot.</li> </ul>	<ul style="list-style-type: none"> <li>Displacement; and</li> <li>Collision</li> </ul>			<p>The Project array is beyond the mean-maximum +1SD foraging ranges (Woodward <i>et al.</i>, 2019) for designated seabird species and therefore has no breeding season connectivity.</p> <p>Therefore, LSE can be discounted in relation to all effects alone in the breeding season. Outside the breeding season, impacts LSE cannot be discounted in relation to all effects alone.</p>
Fair Isle SPA	674.7	690.0	648.7		690.2	696.7	<ul style="list-style-type: none"> <li>Great skua;</li> <li>Fulmar;</li> <li>Arctic skua;</li> <li>Arctic tern;</li> <li>European shag; and</li> <li>Fair Isle wren;</li> </ul>	<ul style="list-style-type: none"> <li>All impacts screened out.</li> </ul>		<p>The Project array is beyond the mean-maximum +1SD foraging ranges (and the maximum SPA site-specific foraging range for fulmar) (Woodward <i>et al.</i>, 2019) for designated seabird species and therefore has no breeding season connectivity. Migrations of birds from this SPA/ Ramsar are likely to result in negligible numbers passing through the site.</p>

Designated Site	Distance to Array (km)	Distance to the Project ECC (km)	Distance to the ANS (km)	Distance to the biogenic reef (km)	Distance to the ORCP (km)	Feature(s) to Consider for Potential LSE	Potential Effects		Potential for LSE
							Construction	Operation and Maintenance	
									Therefore, LSE can be discounted in relation to all effects alone. Outside the breeding season, impacts have been assessed against BDMPS. There is no potential for LSE. <b>Therefore, LSE can be discounted in relation to all effects alone. Outside the breeding season, impacts have been assessed against BDMPS. There is no potential for LSE.</b>
						<ul style="list-style-type: none"> <li>▪ Kittiwake;</li> <li>▪ Guillemot;</li> <li>▪ Razorbill;</li> <li>▪ Puffin; and</li> <li>▪ Gannet.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Displacement</li> <li>▪ Collision</li> </ul>		<p>The Project array is beyond the mean-maximum +1SD foraging ranges (Woodward <i>et al.</i>, 2019) for designated seabird species and therefore has no breeding season connectivity.</p> <p><b>Therefore, LSE can be discounted in relation to all effects alone in the breeding season. Outside the breeding season, impacts LSE cannot be discounted in relation to all effects alone.</b></p>
West Westray SPA	678.5	693.8	650.9	688.6	693.9	<ul style="list-style-type: none"> <li>▪ Fulmar;</li> <li>▪ Arctic skua; and</li> <li>▪ Arctic tern.</li> </ul>	<ul style="list-style-type: none"> <li>▪ All impacts screened out.</li> </ul>		<p>Site has connectivity with breeding fulmar based on mean-maximum +1SD foraging range, however the significance of effects at a population level is considered to decrease exponentially with distance. Due to the large foraging range for this species, the likelihood and or severity of the effect experienced locally is considered negligible. In addition, this species has very low vulnerability to displacement and collision (Bradbury <i>et al.</i>, 2014).</p> <p>The Project array is beyond the mean-maximum +1SD foraging ranges (and the maximum SPA site-specific foraging range for fulmar) (Woodward <i>et al.</i>, 2019) for other designated seabird species and</p>

Designated Site	Distance to Array (km)	Distance to the Project ECC (km)	Distance to the ANS (km)	Distance to the biogenic reef (km)	Distance to the ORCP (km)	Feature(s) to Consider for Potential LSE	Potential Effects		Potential for LSE
							Construction	Operation and Maintenance	
									<p>therefore has no breeding season connectivity. Migrations of birds from this SPA/ Ramsar are likely to result in negligible numbers passing through the site.</p> <p>Therefore, LSE can be discounted in relation to all effects alone. Outside the breeding season, impacts have been assessed against BDMPS. There is no potential for LSE. <b>Therefore, LSE can be discounted in relation to all effects alone. Outside the breeding season, impacts have been assessed against BDMPS. There is no potential for LSE.</b></p>
						<ul style="list-style-type: none"> <li>▪ Kittiwake;</li> <li>▪ Guillemot; and</li> <li>▪ Razorbill</li> </ul>	<ul style="list-style-type: none"> <li>▪ Displacement</li> <li>▪ Collision</li> </ul>		<p>The Project array is beyond the mean-maximum +1SD foraging ranges (Woodward <i>et al.</i>, 2019) for designated seabird species and therefore has no breeding season connectivity.</p> <p><b>Therefore, LSE can be discounted in relation to all effects alone in the breeding season. Outside the breeding season, impacts LSE cannot be discounted in relation to all effects alone.</b></p>
Papa Westray (North Hill and Holm) SPA	684.6	699.9	657.1	695.3	700.7	<ul style="list-style-type: none"> <li>▪ Arctic skua; and</li> <li>▪ Arctic tern;</li> </ul>	<ul style="list-style-type: none"> <li>▪ All impacts screened out.</li> </ul>		<p>The Project array is beyond the mean-maximum +1SD foraging ranges (and the maximum SPA site-specific foraging range for fulmar) (Woodward <i>et al.</i>, 2019) for designated seabird species and therefore has no breeding season connectivity. Migrations of birds from this SPA/ Ramsar are likely to result in negligible numbers passing through the site.</p> <p>Therefore, LSE can be discounted in relation to all effects alone. Outside the breeding season, impacts have</p>

Designated Site	Distance to Array (km)	Distance to the Project ECC (km)	Distance to the ANS (km)	Distance to the biogenic reef (km)	Distance to the ORCP (km)	Feature(s) to Consider for Potential LSE	Potential Effects		Potential for LSE
							Construction	Operation and Maintenance	
									been assessed against BDMPS. There is no potential for LSE. <b>Therefore, LSE can be discounted in relation to all effects alone. There is no potential for LSE.</b>
Sumburgh Head SPA	706.5	722.0	681.8	724.3	731.1	<ul style="list-style-type: none"> <li>Fulmar; and</li> <li>Arctic tern.</li> </ul>	<ul style="list-style-type: none"> <li>All impacts screened out.</li> </ul>	<p>Site has connectivity with breeding fulmar based on mean-maximum +1SD foraging range, however the significance of effects at a population level is considered to decrease exponentially with distance. Due to the large foraging range for this species, the likelihood and or severity of the effect experienced locally is considered negligible. In addition, this species has very low vulnerability to displacement and collision (Bradbury <i>et al.</i>, 2014).</p> <p>It is therefore determined that significant effects would not manifest on this distant SPA/ Ramsar after the likelihood and severity of effects on the SPA have been apportioned to all SPAs within the foraging range.</p> <p>The Project array is beyond the mean-maximum +1SD foraging ranges for all other designated seabird species (Woodward <i>et al.</i>, 2019) and therefore has no breeding season connectivity. Migrations of birds from this SPA are likely to result in negligible numbers passing through the site.</p> <p><b>This SPA is therefore not considered relevant in the context of the HRA and LSE can be discounted in relation to these species for all effects alone.</b></p>	
						<ul style="list-style-type: none"> <li>Guillemot; and</li> <li>Kittiwake</li> </ul>	<ul style="list-style-type: none"> <li>Displacement</li> <li>Collision</li> </ul>	<p>The Project array is beyond the mean-maximum +1SD foraging ranges (Woodward <i>et al.</i>, 2019) for designated seabird species and</p>	

Designated Site	Distance to Array (km)	Distance to the Project ECC (km)	Distance to the ANS (km)	Distance to the biogenic reef (km)	Distance to the ORCP (km)	Feature(s) to Consider for Potential LSE	Potential Effects		Potential for LSE
							Construction	Operation and Maintenance Decommissioning	
									therefore has no breeding season connectivity. <b>Therefore, LSE can be discounted in relation to all effects alone in the breeding season. Outside the breeding season, impacts LSE cannot be discounted in relation to all effects alone.</b>
Noss SPA	733.3	749.0	709.5	752.7	759.8	<ul style="list-style-type: none"> <li>▪ Great skua; and</li> <li>▪ Fulmar.</li> </ul>	<ul style="list-style-type: none"> <li>▪ All impacts screened out.</li> </ul>	<p>Site has connectivity with breeding fulmar based on mean-maximum +1SD foraging range, however the significance of effects at a population level is considered to decrease exponentially with distance. Due to the large foraging range for this species, the likelihood and or severity of the effect experienced locally is considered negligible. In addition, this species has very low vulnerability to displacement and collision (Bradbury <i>et al.</i>, 2014).</p> <p>It is therefore determined that significant effects would not manifest on this distant SPA/ Ramsar after the likelihood and severity of effects on the SPA have been apportioned to all SPAs within the foraging range.</p> <p>The Project array is beyond the mean-maximum +1SD foraging ranges for all other designated seabird species (Woodward <i>et al.</i>, 2019) and therefore has no breeding season connectivity. Migrations of birds from this SPA are likely to result in negligible numbers passing through the site.</p> <p><b>This SPA is therefore not considered relevant in the context of the HRA and LSE can be discounted in relation to all effects alone.</b></p>	



Designated Site	Distance to Array (km)	Distance to the Project ECC (km)	Distance to the ANS (km)		Distance to the biogenic reef (km)	Distance to the ORCP (km)	Feature(s) to Consider for Potential LSE	Potential Effects		Potential for LSE
			Construction	Operation and Maintenance				Decommissioning		
							<ul style="list-style-type: none"> <li>▪ Kittiwake;</li> <li>▪ Gannet;</li> <li>▪ Puffin;</li> <li>▪ Guillemot; and</li> <li>▪ Puffin.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Displacement; and</li> <li>▪ Collision</li> </ul>		<p>The Project array is beyond the mean-maximum +1SD foraging ranges (Woodward <i>et al.</i>, 2019) for designated seabird species and therefore has no breeding season connectivity.</p> <p><b>Therefore, LSE can be discounted in relation to all effects alone in the breeding season. Outside the breeding season, impacts LSE cannot be discounted in relation to all effects alone.</b></p>
Foula SPA	746.7	761.5	726.1	761.2	767.6	<ul style="list-style-type: none"> <li>▪ Fulmar;</li> <li>▪ Red-throated diver</li> <li>▪ Leach’s storm petrel</li> <li>▪ Shag</li> <li>▪ Arctic skua</li> <li>▪ Great skua</li> <li>▪ Arctic tern</li> </ul>	<ul style="list-style-type: none"> <li>▪ All impacts screened out.</li> </ul>		<p>Site has connectivity with breeding fulmar based on mean-maximum +1SD foraging range, however the significance of effects at a population level is considered to decrease exponentially with distance. Due to the large foraging range for this species, the likelihood and or severity of the effect experienced locally is considered negligible. In addition, this species has very low vulnerability to displacement and collision (Bradbury <i>et al.</i>, 2014).</p> <p>It is therefore determined that significant effects would not manifest on this distant SPA/ Ramsar after the likelihood and severity of effects on the SPA have been apportioned to all SPAs within the foraging range.</p> <p>The Project array is beyond the mean-maximum +1SD foraging ranges for all other designated seabird species (Woodward <i>et al.</i>, 2019) and therefore has no breeding season connectivity. Migrations of birds from this SPA are likely to result in negligible numbers passing through the site.</p>	

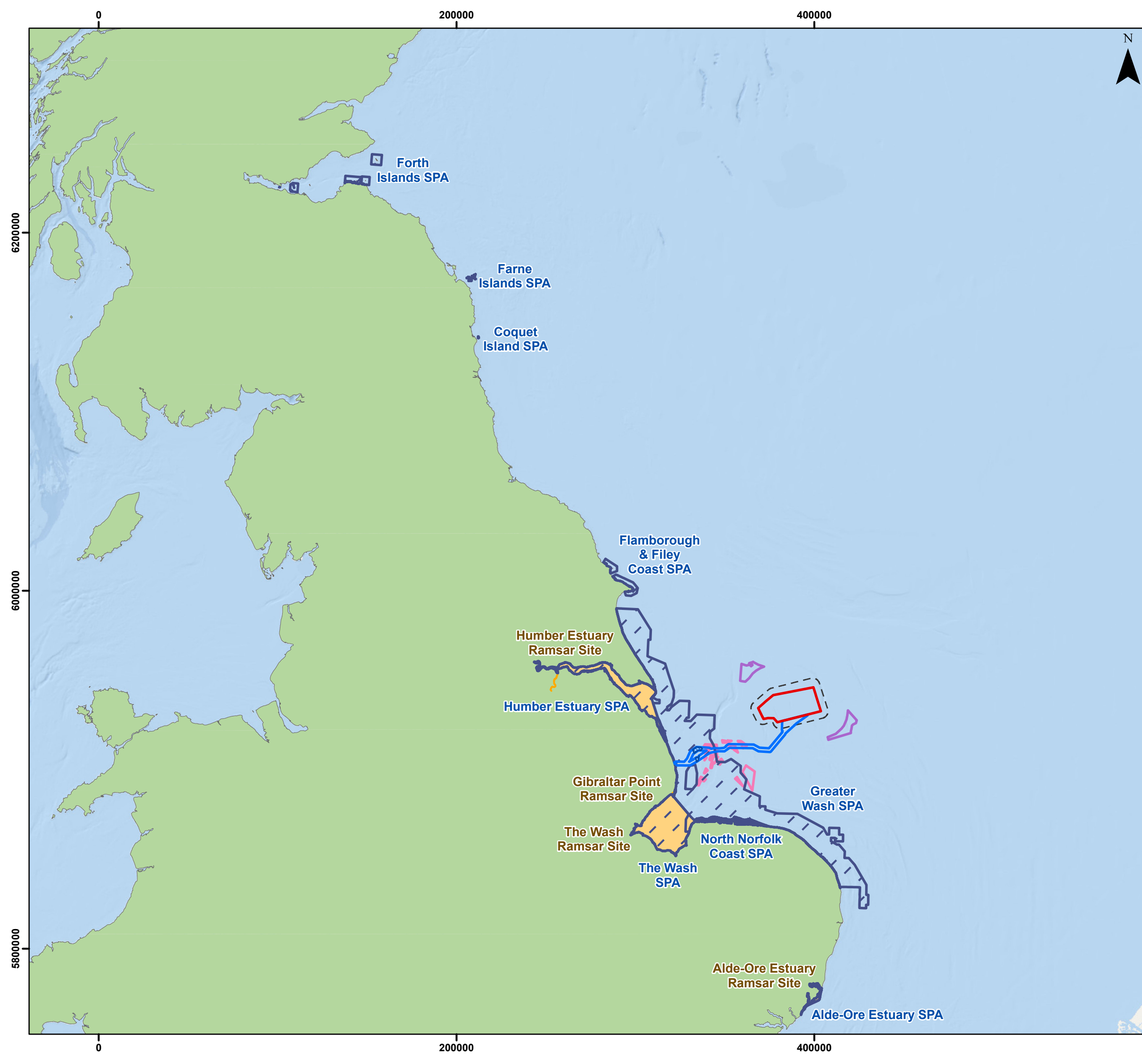
Designated Site	Distance to Array (km)	Distance to the Project ECC (km)	Distance to the ANS (km)	Distance to the biogenic reef (km)	Distance to the ORCP (km)	Feature(s) to Consider for Potential LSE	Potential Effects		Potential for LSE
							Construction	Operation and Maintenance	
									<b>This SPA is therefore not considered relevant in the context of the HRA and LSE can be discounted in relation to all effects alone.</b>
						<ul style="list-style-type: none"> <li>▪ Guillemot;</li> <li>▪ Razorbill;</li> <li>▪ Puffin; and</li> <li>▪ Kittiwake.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Displacement; and</li> <li>▪ Collision</li> </ul>		<p>The Project array is beyond the mean-maximum +1SD foraging ranges (Woodward et al., 2019) for designated seabird species and therefore has no breeding season connectivity.</p> <p><b>Therefore, LSE can be discounted in relation to all effects alone in the breeding season. Outside the breeding season, impacts LSE cannot be discounted in relation to all effects alone.</b></p>

Designated Site	Distance to Array (km)	Distance to the Project ECC (km)	Distance to the ANS (km)	Distance to the biogenic reef (km)	Distance to the ORCP (km)	Feature(s) to Consider for Potential LSE	Potential Effects			Potential for LSE
							Construction	Operation and Maintenance	Decommissioning	
Fetlar SPA	777.5	793.4	754.7	798.6	805.8	<ul style="list-style-type: none"> <li>▪ Arctic skua;</li> <li>▪ Great skua;</li> <li>▪ Fulmar;</li> <li>▪ Arctic tern</li> <li>▪ Dunlin;</li> <li>▪ Red-necked phalarope; and</li> <li>▪ Whimbrel.</li> </ul>	<ul style="list-style-type: none"> <li>▪ All impacts screened out.</li> </ul>			<p>Site has connectivity with breeding fulmar based on mean-maximum +1SD foraging range, however the significance of effects at a population level is considered to decrease exponentially with distance. Due to the large foraging range for this species, the likelihood and or severity of the effect experienced locally is considered negligible. In addition, this species has very low vulnerability to displacement and collision (Bradbury <i>et al.</i>, 2014).</p> <p>It is therefore determined that significant effects would not manifest on this distant SPA/ Ramsar after the likelihood and severity of effects on the SPA have been apportioned to all SPAs within the foraging range.</p> <p>The Project array is beyond the mean-maximum +1SD foraging ranges for all other designated seabird species (Woodward <i>et al.</i>, 2019) and therefore has no breeding season connectivity. Migrations of birds from this SPA are likely to result in negligible numbers passing through the site.</p> <p><b>This SPA is therefore not considered relevant in the context of the HRA and LSE can be discounted in relation to all effects alone.</b></p>
Hermaness, Saxa Vord and Valla Field SPA	798.8	814.6	775.7	819.3	826.5	<ul style="list-style-type: none"> <li>▪ Great skua;</li> <li>▪ European shag;</li> <li>▪ and</li> <li>▪ European shag</li> <li>▪ Red-throated diver; and</li> <li>▪ Fulmar.</li> </ul>	<ul style="list-style-type: none"> <li>▪ All impacts screened out.</li> </ul>			<p>The Project array is beyond the mean-maximum +1SD foraging ranges for these species (Woodward <i>et al.</i>, 2019) and therefore has no breeding season connectivity. Migrations of birds from this SPA are likely to result in negligible numbers passing through the site.</p>

Designated Site	Distance to Array (km)	Distance to the Project ECC (km)	Distance to the ANS (km)	Distance to the biogenic reef (km)	Distance to the ORCP (km)	Feature(s) to Consider for Potential LSE	Potential Effects		Potential for LSE
							Construction	Operation and Maintenance	
									<p><b>This SPA is therefore not considered relevant in the context of the HRA and LSE can be discounted in relation to all effects alone.</b></p>
						<ul style="list-style-type: none"> <li>Guillemot;</li> <li>Puffin;</li> <li>Kittiwake; and</li> <li>Gannet.</li> </ul>	<ul style="list-style-type: none"> <li>Displacement; and</li> <li>Collision</li> </ul>		<p>The Project array is beyond the mean-maximum +1SD foraging ranges (Woodward et al., 2019) for designated seabird species and therefore has no breeding season connectivity.</p> <p><b>Therefore, LSE can be discounted in relation to all effects alone in the breeding season. Outside the breeding season, impacts LSE cannot be discounted in relation to all effects alone.</b></p>
Transboundary sites for Lesser black-backed gull; Duinen en Lage Land Texel; Waddenzee; and Duinen Vlieland.	Various >219km	Various	Various	Various	Various	<ul style="list-style-type: none"> <li>Lesser black-backed gull.</li> </ul>	<ul style="list-style-type: none"> <li>All impacts screened out.</li> </ul>		<p>Site has connectivity with breeding lesser black-backed gull based on mean-maximum +1SD foraging range, however the significance of effects at a population level is considered to decrease exponentially with distance. Due to the foraging range for this species, the likelihood and or severity of the effect experienced locally is considered negligible. In addition, this species has very low vulnerability to displacement and collision (Bradbury et al., 2014).</p> <p>It is therefore determined that significant effects would not manifest on this distant SPA/ Ramsar after the likelihood and severity of effects on the SPA have been apportioned to all SPAs within the foraging range.</p> <p>The Project array is beyond the mean-maximum +1SD foraging ranges for all other designated seabird species (Woodward et al., 2019) and therefore has no breeding season connectivity. Migrations of birds from</p>

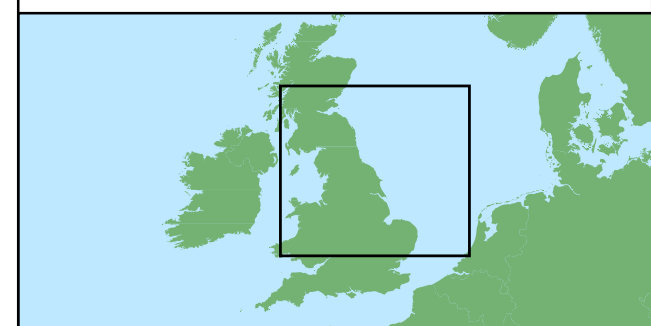
Designated Site	Distance to Array (km)	Distance to the Project ECC (km)	Distance to the ANS (km)	Distance to the biogenic reef (km)	Distance to the ORCP (km)	Feature(s) to Consider for Potential LSE	Potential Effects		Potential for LSE
							Construction	Operation and Maintenance	
									<p>this SPA are likely to result in negligible numbers passing through the site.</p> <p><b>This SPA is therefore not considered relevant in the context of the HRA and LSE can be discounted in relation to all effects alone.</b></p>
Transboundary sites for Northern fulmar; Littoral seino-marin; Cap Sizun; Cote de Granit Rose-Sept Iles; Tregor Goëlo; Cap d'Erquy-Cap Fréhel; Camaret; Falaise du Bessin Occidental; Seevogelschutzgebiet Helgoland; and Ouessant-Molène	Various >373km	Various	Various	Various	Various	<ul style="list-style-type: none"> <li>Northern fulmar.</li> </ul>	<ul style="list-style-type: none"> <li>All impacts screened out.</li> </ul>		<p>Sites have connectivity with breeding fulmar based on mean-maximum +1SD foraging range, however the distance is at the extent of the foraging range and the significance of effects at a population level is considered to decrease exponentially with distance. Due to the large foraging range for this species, the likelihood and or severity of the effect experienced locally is considered negligible. In addition, this species has very low vulnerability to displacement (Bradbury <i>et al.</i>, 2014).</p> <p>It is therefore determined that significant effects would not manifest on these distant SPAs/ Ramsars after the likelihood and severity of effects on the SPAs have been apportioned to all SPAs within the foraging range.</p> <p><b>These SPAs are therefore not considered relevant in the context of the HRA and LSE can be discounted in relation to all effects alone.</b></p>
Transboundary sites for Manx shearwater; Cote de Granit Rose-Sept Iles; Iles Houat-Hoedic; Ouessant-Molène; and Baie de Morlaix.	Various >581km	Various	Various	Various	Various	<ul style="list-style-type: none"> <li>Manx shearwater.</li> </ul>	<ul style="list-style-type: none"> <li>All impacts screened out.</li> </ul>		<p>Sites have connectivity with breeding Manx shearwater based on mean-maximum +1SD foraging range, however the significance of effects at a population level is considered to decrease exponentially with distance. Due to the large foraging range for this species, the likelihood and or severity of the effect experienced locally is considered negligible. In</p>

Designated Site	Distance to Array (km)	Distance to the Project ECC (km)	Distance to the ANS (km)	Distance to the biogenic reef (km)	Distance to the ORCP (km)	Feature(s) to Consider for Potential LSE	Construction	Potential Effects Operation and Maintenance	Decommissioning	Potential for LSE
										<p>addition, this species has very low vulnerability to displacement and collision (Bradbury <i>et al.</i>, 2014). It is therefore determined that significant effects would not manifest on these distant SPAs/ Ramsars after the likelihood and severity of effects on the SPAs have been apportioned to all SPAs within the foraging range.</p> <p><b>These SPAs are therefore not considered relevant in the context of the HRA and LSE can be discounted in relation to all effects alone.</b></p>



**Legend**

- Array Area
- Offshore Export Cable Corridor
- ORCP Area
- Artificial Nesting Structure Area
- Biogenic Reef Restoration Area
- 4km Buffer from Array Area
- SPA
- Ramsar Site



Coordinate System: WGS 1984 UTM Zone 31N  
 0 50 100 km  
 Scale: 1:2,000,000 A3 Page Size

Environmental Statement  
 Designated Sites with a Potential for LSE for Offshore and Intertidal Ornithology Receptors  
 Figure 5.3



Date: 13/02/2024  
 Produced By: BPHB  
 Revision: 0.1

Contains ESRI Basemapping; Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

Document Path: Z:\GIS\GIS - Projects\0152 Outer Dowsing ELA\GIS\Figures\ES\HRA Screening\ODOW\_0152\_HRA\_Fig 5.3 Designated Sites Ornithology.mxd

## 5.5 Migratory Fish Screening

117. The study area for migratory fish for this project, with respect to Stage 1 Screening, is defined by a range of 100km from the Project. Table 5.7 presents the potential effects considered for the migratory fish receptors identified.

Table 5.7: Migratory Fish Receptor Group Potential Effects.

Potential Effect	Activities Potentially Resulting in Effect		
	Construction	Operation and Maintenance	Decommissioning
Underwater noise	<ul style="list-style-type: none"> <li>▪ Piling;</li> <li>▪ UXO;</li> <li>▪ Construction vessel noise;</li> <li>▪ Other construction activities;</li> <li>▪ Acoustic/geophysical surveys;</li> <li>▪ ADD; and</li> <li>▪ Any in-combination effects identified.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Acoustic/geophysical surveys;</li> <li>▪ Vessel noise;</li> <li>▪ Operational noise; and</li> <li>▪ Any in-combination effects identified.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Piling;</li> <li>▪ UXO;</li> <li>▪ Construction vessel noise;</li> <li>▪ Other construction activities;</li> <li>▪ Acoustic/geophysical surveys;</li> <li>▪ ADD; and</li> <li>▪ Any in-combination effects identified.</li> </ul>
Suspended sediment/deposition	<ul style="list-style-type: none"> <li>▪ Installation of structures (e.g. piling);</li> <li>▪ Seabed preparation;</li> <li>▪ Seabed dredging and sandwave clearance;</li> <li>▪ Sediment disposal;</li> <li>▪ Cable installation; and</li> <li>▪ Any in-combination effects identified.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Maintenance of structures; and</li> <li>▪ Any in-combination effects identified.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Installation of structures (e.g. piling);</li> <li>▪ Seabed preparation;</li> <li>▪ Seabed dredging and sandwave clearance;</li> <li>▪ Sediment disposal;</li> <li>▪ Cable installation; and</li> <li>▪ Any in-combination effects identified.</li> </ul>
Indirect pollution (release of contaminants within the sediment)	<ul style="list-style-type: none"> <li>▪ Installation of structures;</li> <li>▪ Seabed preparation;</li> </ul>	<ul style="list-style-type: none"> <li>▪ Maintenance of structures; and</li> <li>▪ Any in-combination effects identified.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Installation of structures;</li> <li>▪ Seabed preparation;</li> </ul>



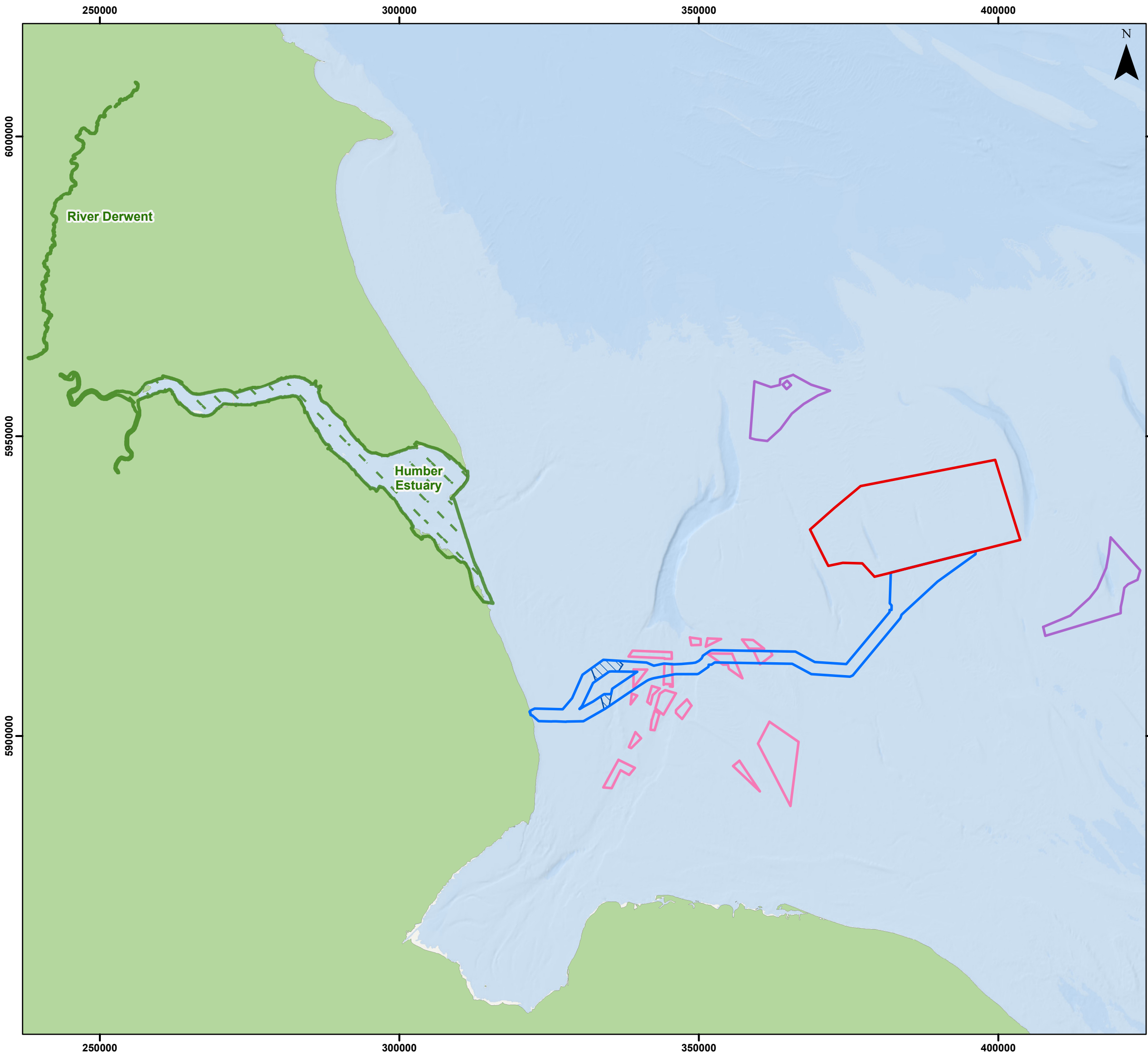
Potential Effect	Activities Potentially Resulting in Effect		
	Construction	Operation and Maintenance	Decommissioning
	<ul style="list-style-type: none"> <li>▪ Seabed dredging and sandwave clearance;</li> <li>▪ Installation of scour or cable protection; and</li> <li>▪ Any in-combination effects identified.</li> </ul>		<ul style="list-style-type: none"> <li>▪ Seabed dredging and sandwave clearance;</li> <li>▪ Installation of scour or cable protection; and</li> <li>▪ Any in-combination effects identified.</li> </ul>
Accidental pollution	<ul style="list-style-type: none"> <li>▪ Release of contaminants;</li> <li>▪ Release of sediment (via all activities listed for suspended sediment/deposition in Table 5.1); and</li> <li>▪ Any in-combination effects identified.</li> </ul>		
EMF	<ul style="list-style-type: none"> <li>▪ N/A</li> </ul>	<ul style="list-style-type: none"> <li>▪ Generation of EMF from installed cables; and</li> <li>▪ Any in-combination effects identified.</li> </ul>	<ul style="list-style-type: none"> <li>▪ N/A</li> </ul>
INNS	<ul style="list-style-type: none"> <li>▪ Vessel movements on and off site;</li> <li>▪ Installation of solid structures; and</li> <li>▪ Any in-combination effects identified.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Vessel movements on and off site;</li> <li>▪ Maintenance of activities;</li> <li>▪ Presence of solid structures; and</li> <li>▪ Any in-combination effects identified.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Vessel movements on and off site;</li> <li>▪ Installation of solid structures; and</li> <li>▪ Any in-combination effects identified.</li> </ul>
Physical habitat loss/disturbance	<ul style="list-style-type: none"> <li>▪ Installation of structures;</li> <li>▪ Seabed preparation;</li> <li>▪ Seabed dredging;</li> <li>▪ Sediment disposal;</li> <li>▪ Vessel movements and anchoring; and</li> <li>▪ Any in-combination effects identified.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Maintenance of structures; and</li> <li>▪ Any in-combination effects identified.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Installation of structures;</li> <li>▪ Seabed preparation;</li> <li>▪ Seabed dredging;</li> <li>▪ Sediment disposal;</li> <li>▪ Vessel movements and anchoring; and</li> <li>▪ Any in-combination effects identified.</li> </ul>

Potential Effect	Activities Potentially Resulting in Effect		
	Construction	Operation and Maintenance	Decommissioning
Changes to prey	<ul style="list-style-type: none"> <li>▪ Generation of underwater noise from construction/maintenance activities;</li> <li>▪ Loss of supporting habitats (via all activities listed for habitats loss/disturbance in Table 5.1);</li> <li>▪ Vessel movements;</li> <li>▪ EMF; and</li> <li>▪ Any in-combination effects identified.</li> </ul>		

118. Stage 1 Screening (as presented in Table 5.8) determines the potential for a pathway to exist between the Project and each designated site identified based on the screening ranges identified for impacts arising during construction, operation and maintenance and decommissioning. Where potential for an impact to impinge on the conservation objectives of a site is identified, potential for LSE is concluded. All sites where a potential for LSE has been concluded for migratory fish receptors are depicted in Figure 5.4.

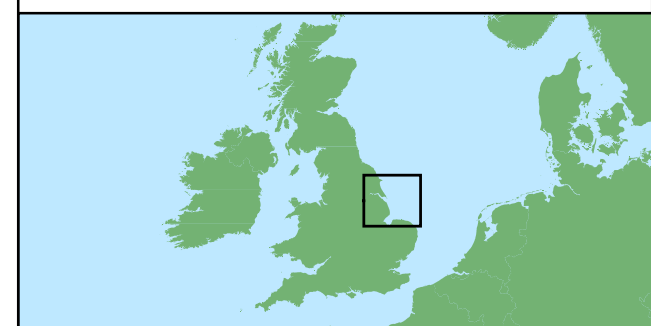
Table 5.8: Migratory Fish Screening

Designated Site	Distance to Array (km)	Distance to the Project ECC (km)	Distance to the ANS (km)	Distance to the biogenic reef (km)	Distance to the ORCP (km)	Feature(s) to Consider for Potential LSE	Potential Effects Construction	Operation and Maintenance	Decommissioning	Potential for LSE
Humber Estuary SAC	54.4	18.5	47.5	23.8	19.7	<ul style="list-style-type: none"> <li>▪ Sea lamprey <i>Petromyzon marinus</i>; and</li> <li>▪ River lamprey <i>Lampetra fluviatilis</i></li> </ul>	<ul style="list-style-type: none"> <li>▪ Underwater noise.</li> </ul>	<ul style="list-style-type: none"> <li>▪ N/A</li> </ul>	<ul style="list-style-type: none"> <li>▪ Underwater noise.</li> </ul>	The range between the Project and designated site mean that <b>there is a potential for LSE for this species at this site.</b>
							<ul style="list-style-type: none"> <li>▪ Suspended sediment/ deposition;</li> <li>▪ Indirect pollution;</li> <li>▪ Accidental pollution;</li> <li>▪ EMF;</li> <li>▪ INNS;</li> <li>▪ Physical habitat loss/ disturbance; and</li> <li>▪ Changes to prey.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Underwater noise;</li> <li>▪ Suspended sediment/ deposition;</li> <li>▪ Indirect pollution;</li> <li>▪ Accidental pollution;</li> <li>▪ EMF;</li> <li>▪ INNS;</li> <li>▪ Physical habitat loss/ disturbance; and</li> <li>▪ Changes to prey.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Suspended sediment/ deposition;</li> <li>▪ Indirect pollution;</li> <li>▪ Accidental pollution;</li> <li>▪ EMF;</li> <li>▪ INNS;</li> <li>▪ Physical habitat loss/ disturbance; and</li> <li>▪ Changes to prey.</li> </ul>	<b>No potential for LSE.</b> These features have been screened out from assessment as a result of the distance between the Project and the designated site.



**Legend**

- Array Area
- Offshore Export Cable Corridor
- ORCP Area
- Artificial Nesting Structure Area
- Biogenic Reef Restoration Area
- Special Areas of Conservation (SAC)



Coordinate System: WGS 1984 UTM Zone 31N  
 0 10 20 km  
 Scale: 1:600,000  
 A3 Page Size

Environmental Statement  
 Designated Sites with a Potential for  
 LSE for Migratory Fish Receptors  
 Figure 5.4



Date: 13/02/2024  
 Produced By: BPHB  
 Revision: 0.1  
 Contains ESRI Basemapping;  
 Esri, Garmin, GEBCO, NOAA  
 NGDC, and other contributors  
 GoBe

Document Path: Z:\GIS\GIS - Projects\0152 Outer Dowsing ELA\GIS\Figures\ESHRA Screening\ODOW\_0152\_HRA\_Fig\_5.4\_Migratory\_Fish\_SACs.mxd

## 5.6 Onshore Screening

119. A summary of potential effects on onshore National Site Network and Ramsar Sites within 15km is provided in Table 5.9 and Figure 5.5 with a more detailed screening for LSE, for each of the relevant qualifying features at each stage of the proposed development, provided in Table 5.10.
120. Given the presence of National Site Network and Ramsar Sites within the Proposed Development and surrounding area, and the potential use of the Zol by species that are part of the qualifying interest of these sites, there is a risk of direct and indirect effects on these sites during construction, operation and decommissioning of the onshore infrastructure. This risk arises mainly from (i) potential disturbance and displacement of birds and (ii) pollution from site run-off during construction of the proposed development. There is also the possibility of permanent loss of habitat used by qualifying interest bird species outside of the designated sites from permanent infrastructure. There is a further risk of impacts on populations of scarce plants and invertebrates and Annex I habitats inside and outside the Ramsar sites and SACs. Possible impacts from air quality may also require further assessment or mitigation. Therefore, without mitigation and further assessment is not possible to conclude no LSE for the onshore elements.
121. Given the presence of the designated sites partially within the Zol, the mobility of the birds, and the hydrological connections between the Zol, all National Site Network and Ramsar Sites listed in Table 5.9 should be considered for screening for appropriate assessment.

Table 5.9: Summary of Potential Effects on European and Ramsar Sites (Onshore)

Site	Closest Distance to the Project (Order Limits) (km)	Potential Effects on Qualifying Interest Features
Humber Estuary SPA	12.5km NNW	Risk of disturbance, and of temporary loss of foraging, roosting and nesting habitat for birds outside the SPA.
Humber Estuary Ramsar Site	12.5 km NNW	Risk of disturbance, and of temporary loss of foraging and roosting habitat for birds outside the Ramsar site.
Humber Estuary SAC	18.97 km NW	Due to the distance between the Order Limits and the SAC, and the nature of the habitats, there is no risk of undermining the conservation objectives for this SAC for the project alone however it is possible that pollution from the project combines with that from other sources and affects the SAC.
Saltfleetby-Theddlethorpe Dunes & Gibraltar Point SAC	4.15 km E at Gibraltar Point	Risk of pollution to affect habitat quality.
The Wash SPA	0.18 km SE	Risk of disturbance inside and outside the SPA and temporary loss of foraging, roosting, and nesting habitat for birds outside the SPA. Risk of pollution.

Site	Closest Distance to the Project (Order Limits) (km)	Potential Effects on Qualifying Interest Features
The Wash Ramsar Site	0.18 km SE	Risk of disturbance inside and outside the Ramsar and temporary loss of foraging, roosting and nesting habitat outside the Ramsar site. Risk of pollution.
The Wash & North Norfolk Coast SAC	0.18 km ESE	Displacement of otter and reduction of otter habitat.
Greater Wash SPA	0 km E, immediately adjacent to Order Limits	Risk of disturbance of foraging birds inside the SPA. Risk of pollution.
Gibraltar Point SPA	4.15 km ENE	Risk of loss of foraging, roosting and nesting habitat within the site and surrounding area. Risk of disturbance of birds within and outside the SPA. Risk of pollution.
Gibraltar Point Ramsar Site	4.15 km ENE	Risk of pollution. Risk of disturbance, and of temporary loss of foraging and roosting habitat for dark-bellied brent goose outside the Ramsar site.
North Norfolk Coast SPA	23.9 km SE	Risk of disturbance, and of temporary loss of foraging and roosting habitat for pink-footed goose outside the SPA.
North Norfolk Ramsar	23.9 km SE	Risk of disturbance, and of temporary loss of foraging and roosting habitat for pink-footed goose outside the Ramsar site.

Table 5.10: Potential for LSE for Onshore Ecology

Designated Site	Distance to Onshore ECC (km)	Feature(s) to Consider for Potential LSE	Effects Considered			Consideration of LSE	Conclusion
			Construction	Operations and Maintenance	Decommissioning		
Humber Estuary SPA	12.5	<ul style="list-style-type: none"> <li>▪ Great bittern <i>Botaurus stellaris</i> (Non-breeding and breeding)</li> <li>▪ Common shelduck <i>Tadorna tadorna</i> (Non-breeding)</li> <li>▪ Eurasian marsh harrier <i>Circus aeruginosus</i> (Breeding)</li> <li>▪ Hen harrier <i>Circus cyaneus</i> (Non-breeding)</li> <li>▪ Pied avocet <i>Recurvirostra avosetta</i> (Non-breeding and breeding)</li> <li>▪ European golden plover <i>Pluvialis apricaria</i> (Non-breeding)</li> <li>▪ Red knot <i>Calidris canutus</i> (Non-breeding)</li> <li>▪ Dunlin <i>Calidris alpina alpina</i> (Non-breeding)</li> <li>▪ Ruff <i>Philomachus pugnax</i> (Non-breeding)</li> <li>▪ Black-tailed godwit <i>Limosa limosa islandica</i> (Non-breeding)</li> <li>▪ Bar-tailed godwit <i>Limosa lapponica</i> (Non-breeding)</li> <li>▪ Common redshank <i>Tringa totanus</i> (Non-breeding)</li> <li>▪ Little tern <i>Sterna albifrons</i> (Breeding)</li> <li>▪ Waterbird assemblage</li> </ul>	<ul style="list-style-type: none"> <li>▪ Loss of foraging, roosting and nesting habitat inside and outside the SPA for birds</li> <li>▪ Disturbance/ displacement of birds inside and outside the SPA</li> <li>▪ Pollution from site run-off affecting habitat quality and resources</li> </ul>	<ul style="list-style-type: none"> <li>▪ Disturbance/ displacement of birds arising from vehicles and workers accessing onshore structures for maintenance</li> </ul>	<ul style="list-style-type: none"> <li>▪ Disturbance/ displacement of birds inside and outside the SPA</li> <li>▪ Pollution from site run-off affecting habitat quality.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Risk of disturbance, and of loss of foraging, roosting and nesting habitat for birds outside the SPA only</li> </ul>	<b>Potential for LSE on all qualifying features.</b>
Humber Estuary Ramsar site	12.5	<ul style="list-style-type: none"> <li>▪ Criterion 1- dune systems and humid dune slacks</li> <li>▪ Criterion 5 – assemblages of international importance (waterfowl, non-breeding season)</li> <li>▪ Criterion 6 – species/populations occurring at levels of international importance</li> </ul>	<ul style="list-style-type: none"> <li>▪ Loss of estuary habitats such as dune systems and dune slacks</li> <li>▪ Loss of foraging, roosting and nesting habitat inside and outside the Ramsar site</li> </ul>	<ul style="list-style-type: none"> <li>▪ Damage to habitats and disturbance/ displacement of birds arising from vehicles and workers accessing onshore structures for maintenance</li> </ul>	<ul style="list-style-type: none"> <li>▪ Disturbance/ displacement of birds inside and outside the Ramsar site</li> <li>▪ Pollution from site run-off affecting habitat quality</li> </ul>	<ul style="list-style-type: none"> <li>▪ Risk of disturbance, and of loss of foraging and roosting habitat for birds outside the Ramsar site only</li> </ul>	<b>Potential for LSE on all ornithological qualifying features.</b>

Designated Site	Distance to Onshore ECC (km)	Feature(s) to Consider for Potential LSE	Effects Considered			Consideration of LSE	Conclusion
			Construction	Operations and Maintenance	Decommissioning		
		<ul style="list-style-type: none"> <li>Common shelduck <i>Tadorna tadorna</i></li> <li>Eurasian golden plover <i>Pluvialis apricaria</i></li> <li>Red knot <i>Calidris canutus islandica</i> subspecies</li> <li>Dunlin <i>Calidris alpina</i></li> <li>Black-tailed godwit <i>Limosa limosa islandica</i> subspecies</li> <li>Bar-tailed godwit <i>Limosa lapponica lapponica</i> subspecies</li> <li>Common redshank <i>Tringa tetanus brittanica</i> subspecies</li> </ul>	<ul style="list-style-type: none"> <li>Disturbance of birds inside and outside the Ramsar site</li> <li>Possible loss of estuary habitats</li> <li>Pollution from site run-off affecting habitat quality and resources</li> </ul>				
Humber Estuary SAC	18.5	<ul style="list-style-type: none"> <li>H1110. Sandbanks which are slightly covered by sea water all the time; Subtidal sandbanks</li> <li>H1130. Estuaries</li> <li>H1140. Mudflats and sandflats not covered by seawater at low tide; Intertidal mudflats and sandflats</li> <li>H1150. Coastal lagoons</li> <li>H1310. Salicornia and other annuals colonising mud and sand; Glasswort and other annuals colonising mud and sand</li> <li>H1330. Atlantic salt meadows (<i>Glauco-Puccinellietalia maritima</i>)</li> <li>H2110. Embryonic shifting dunes</li> <li>H2120. Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes)</li> <li>H2130. Fixed dunes with herbaceous vegetation (grey dunes); Dune grassland*</li> </ul>	<ul style="list-style-type: none"> <li>Possible loss of or damage to Annex I estuary habitats; and</li> <li>Pollution from site run-off affecting habitat quality.</li> </ul>	<ul style="list-style-type: none"> <li>Damage to habitats from operations and maintenance activities.</li> </ul>	<ul style="list-style-type: none"> <li>Pollution from site run-off affecting habitat quality.</li> </ul>	<ul style="list-style-type: none"> <li>Due to the distance between the Order Limits and the SAC, and the nature of the habitats, there is no risk of undermining the conservation objectives for this SAC.</li> </ul>	<b>No potential for LSE on any qualifying features.</b>



Designated Site	Distance to Onshore ECC (km)	Feature(s) to Consider for Potential LSE	Effects Considered			Consideration of LSE	Conclusion
			Construction	Operations and Maintenance	Decommissioning		
		<ul style="list-style-type: none"> <li>H2160. Dunes with <i>Hippophae rhamnoides</i>; Dunes with sea-buckthorn</li> </ul>					
Saltleetby-Theddlethorpe Dunes & Gibraltar Point SAC	4.15 (Gibraltar Point)	Annex I habitats: <ul style="list-style-type: none"> <li>2110 Embryonic shifting dunes</li> <li>2120 Shifting dunes along the shoreline with <i>Ammophila arenaria</i> ("white dunes")</li> <li>2130 Fixed coastal dunes with herbaceous vegetation ("grey dunes")</li> <li>2160 Dunes with <i>Hippophae rhamnoides</i></li> <li>2190 Humid dune slacks</li> </ul>	<ul style="list-style-type: none"> <li>Disturbance and loss of Annex I habitats present within the SAC</li> <li>Disturbance to species present within the SAC</li> <li>Reduction of habitat quality</li> <li>Loss of, or damage to habitat</li> <li>Pollution from site run-off</li> </ul>	<ul style="list-style-type: none"> <li>Damage to habitats from operations and maintenance activities.</li> <li>Pollution from site run-off.</li> </ul>	<ul style="list-style-type: none"> <li>Disturbance and loss of Annex I habitats present within the SAC</li> <li>Disturbance to species present within the SAC</li> <li>Reduction of habitat quality</li> <li>Loss of or damage to habitat</li> <li>Pollution from site run-off</li> </ul>	<ul style="list-style-type: none"> <li>Pollution from site run-off.</li> </ul>	<b>Potential for LSE on all qualifying features.</b> This is a precautionary conclusion based on project design uncertainties.
The Wash SPA	0.18	<ul style="list-style-type: none"> <li>Bewick's swan <i>Cygnus columbianus bewickii</i> (Non-breeding)</li> <li>Pink-footed goose <i>Anser brachyrhynchus</i> (Non-breeding)</li> <li>Dark-bellied brent goose <i>Branta bernicla bernicla</i> (Non-breeding)</li> <li>Common shelduck <i>Tadorna tadorna</i> (Non-breeding)</li> <li>Eurasian wigeon <i>Mareca penelope</i> (Non-breeding)</li> <li>Gadwall <i>Anas strepera</i> (Non-breeding)</li> <li>Northern pintail <i>Anas acuta</i> (Non-breeding)</li> <li>Black (common) scoter <i>Melanitta nigra</i> (Non-breeding);</li> <li>Common goldeneye <i>Bucephala clangula</i> (Non-breeding)</li> <li>Eurasian oystercatcher <i>Haematopus ostralegus</i> (Non-breeding)</li> </ul>	<ul style="list-style-type: none"> <li>Loss of foraging, roosting, and nesting habitat inside and outside the SPA</li> <li>Disturbance of birds inside and outside the SPA</li> <li>Pollution from site run-off affecting habitat quality</li> </ul>	<ul style="list-style-type: none"> <li>Disturbance/displacement of birds arising from vehicles and workers accessing onshore structures for maintenance</li> </ul>	<ul style="list-style-type: none"> <li>Disturbance/displacement of birds inside and outside SPA</li> <li>Pollution from site run-off affecting habitat quality</li> </ul>	<ul style="list-style-type: none"> <li>Risk of disturbance inside and outside the SPA and loss of foraging, roosting and nesting habitat for birds outside the SPA</li> <li>Risk of pollution</li> </ul>	<b>Potential for LSE on all qualifying features.</b>

Designated Site	Distance to Onshore ECC (km)	Feature(s) to Consider for Potential LSE	Effects Considered			Consideration of LSE	Conclusion
			Construction	Operations and Maintenance	Decommissioning		
		<ul style="list-style-type: none"> <li>▪ Grey plover <i>Pluvialis squatarola</i> (Non-breeding)</li> <li>▪ Red knot <i>Calidris canutus</i> (Non-breeding)</li> <li>▪ Sanderling <i>Calidris alba</i> (Non-breeding)</li> <li>▪ Dunlin <i>Calidris alpina alpina</i> (Non-breeding)</li> <li>▪ Black-tailed godwit <i>Limosa limosa islandica</i> (Non-breeding)</li> <li>▪ Bar-tailed godwit <i>Limosa lapponica</i> (Non-breeding)</li> <li>▪ Eurasian curlew <i>Numenius arquata</i> (Non-breeding)</li> <li>▪ Common redshank <i>Tringa totanus</i> (Non-breeding)</li> <li>▪ Ruddy turnstone <i>Arenaria interpres</i> (Non-breeding)</li> <li>▪ Common tern <i>Sterna hirundo</i> (Breeding)</li> <li>▪ Little tern <i>Sterna albifrons</i> (Breeding)</li> <li>▪ Waterbird assemblage</li> </ul>					
The Wash Ramsar Site	0.18	<ul style="list-style-type: none"> <li>▪ Criterion 1 – Saltmarshes, major intertidal banks of sand and mud, shallow water, and deep channels</li> <li>▪ Criterion 3 – inter-relationship between saltmarshes, intertidal sand, mudflats, and estuarine waters</li> <li>▪ Criterion 5 – Bird assemblages of international importance</li> <li>▪ Criterion 6 – Bird species/populations occurring at levels of international importance.</li> </ul> <p>Species with peak counts in spring/autumn:</p>	<ul style="list-style-type: none"> <li>▪ Possible loss of or damage to estuary habitats</li> <li>▪ Loss of foraging and roosting habitat inside and outside the Ramsar site</li> <li>▪ Disturbance of birds inside and outside the Ramsar site</li> <li>▪ Pollution from site run-off affecting habitat quality</li> </ul>	<ul style="list-style-type: none"> <li>▪ Damage to habitats and disturbance/displacement of birds arising from vehicles and workers accessing onshore structures for maintenance</li> </ul>	<ul style="list-style-type: none"> <li>▪ Disturbance/displacement of birds inside and outside the Ramsar site</li> <li>▪ Pollution from site run-off affecting habitat quality</li> </ul>	<ul style="list-style-type: none"> <li>▪ Risk of disturbance inside and outside the SPA and loss of foraging, roosting and nesting habitat outside the Ramsar site</li> <li>▪ Risk of pollution</li> </ul>	<b>Potential for LSE on all qualifying features.</b>

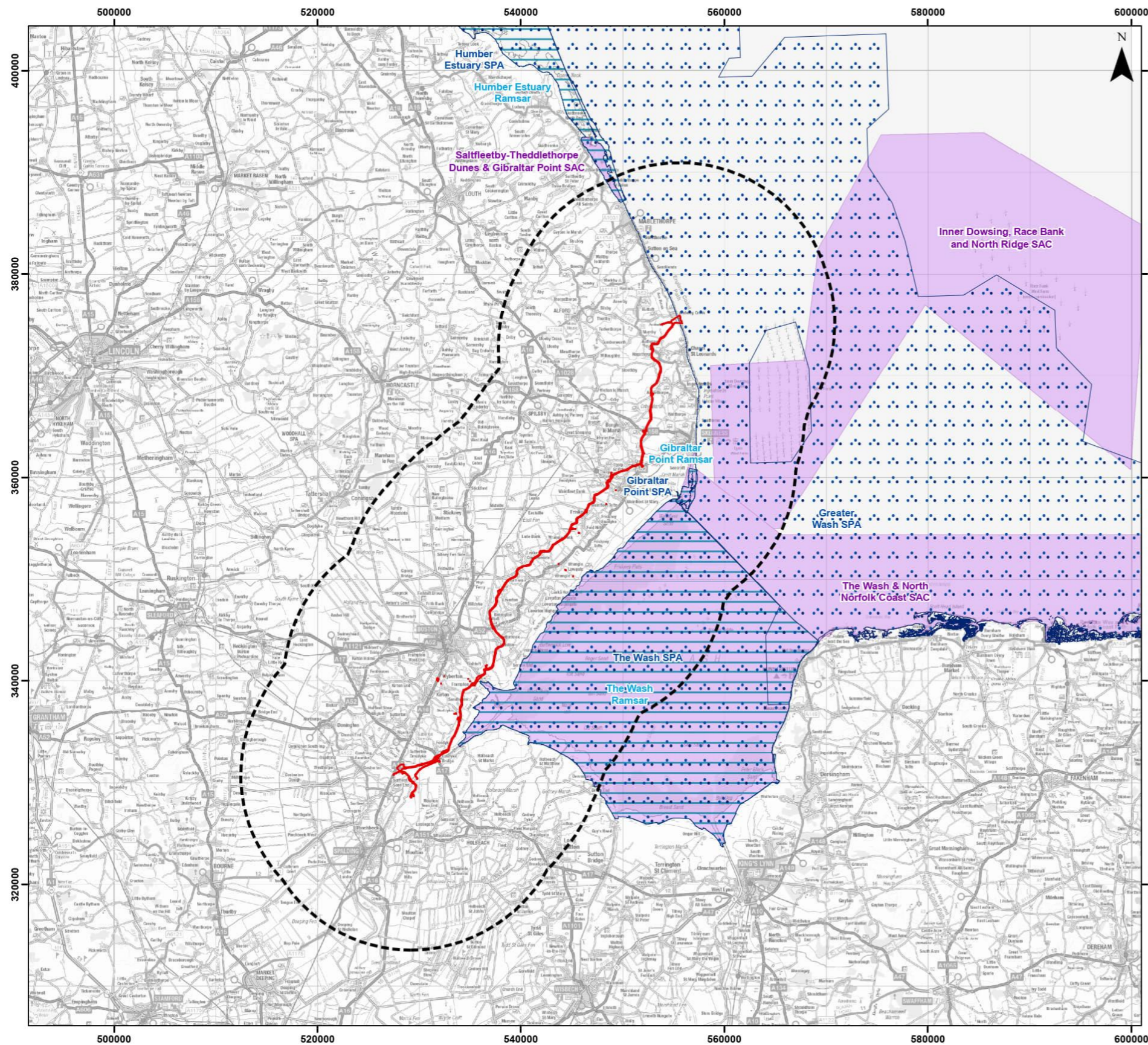
Designated Site	Distance to Onshore ECC (km)	Feature(s) to Consider for Potential LSE	Effects Considered			Consideration of LSE	Conclusion
			Construction	Operations and Maintenance	Decommissioning		
		<ul style="list-style-type: none"> <li>▪ Common redshank <i>Tringa totanus</i>;</li> <li>▪ Eurasian curlew <i>Numenius arquata arquata</i> (breeding)</li> <li>▪ Eurasian oystercatcher <i>Haematopus ostralegus ostralegus</i> (wintering)</li> <li>▪ Grey plover <i>Pluvialis squatarola</i> (wintering)</li> <li>▪ Red knot <i>Calidris canutus islandica</i> (wintering)</li> <li>▪ Sanderling <i>Calidris alba</i>.</li> </ul> <p>Species with peak counts in winter:</p> <ul style="list-style-type: none"> <li>▪ Black-headed gull <i>Larus ridibundus</i></li> <li>▪ Common eider <i>Somateria mollissima mollissima</i></li> <li>▪ Bar-tailed godwit <i>Limosa lapponica lapponica</i></li> <li>▪ Common shelduck <i>Tadorna tadorna</i>;</li> <li>▪ Dark-bellied brent goose <i>Branta bernicla bernicla</i></li> <li>▪ Dunlin <i>Calidris alpina alpina</i></li> <li>▪ Pink-footed goose <i>Anser brachyrhynchus</i></li> <li>▪ European golden plover <i>Pluvialis apricaria altifrons</i></li> <li>▪ Northern lapwing <i>Vanellus vanellus</i></li> </ul> <p>Species with peak counts in spring/autumn:</p> <ul style="list-style-type: none"> <li>▪ Black-tailed godwit <i>Limosa limosa islandica</i></li> <li>▪ Ringed plover <i>Charadrius hiaticula</i></li> </ul>					
The Wash & North Norfolk Coast SAC	0.01	<ul style="list-style-type: none"> <li>▪ 1330 Atlantic salt meadows (<i>Glauco-Puccinellietalia maritima</i>)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Disturbance and loss of Annex I habitats present within the SAC</li> </ul>	<ul style="list-style-type: none"> <li>▪ Damage to habitats from operations and maintenance activities</li> <li>▪ Disturbance of otter</li> </ul>	<ul style="list-style-type: none"> <li>▪ Disturbance and loss of Annex I habitats present within the SAC</li> </ul>	<ul style="list-style-type: none"> <li>▪ Displacement of Otter and reduction of otter habitat</li> </ul>	<b>Potential for LSE on all qualifying features.</b>

Designated Site	Distance to Onshore ECC (km)	Feature(s) to Consider for Potential LSE	Effects Considered			Consideration of LSE	Conclusion
			Construction	Operations and Maintenance	Decommissioning		
		<ul style="list-style-type: none"> <li>1420 Mediterranean and thermo-Atlantic halophilous scrubs (<i>Sarcocornetea fruticosi</i>)</li> <li>1150 Coastal lagoons *Priority feature</li> <li>Otter</li> </ul>	<ul style="list-style-type: none"> <li>Disturbance to species present within the SAC</li> <li>Displacement of otter and reduction of otter habitat.</li> </ul>		<ul style="list-style-type: none"> <li>Disturbance to species present within the SAC</li> <li>Reduction of habitat quality</li> <li>Displacement of otter</li> </ul>		This is a precautionary conclusion based on project design uncertainties.
Greater Wash SPA	0.0	Breeding bird species: <ul style="list-style-type: none"> <li>Sandwich tern <i>Sterna sandvicensis</i></li> <li>Common tern <i>Sterna hirundo</i></li> <li>Little tern <i>Sternula albifrons</i>.</li> </ul>	<ul style="list-style-type: none"> <li>Loss of foraging and nesting habitat inside and outside the SPA for birds</li> <li>Possible impact on migratory bird species using the site</li> <li>Disturbance of birds within and outside the SPA</li> <li>Pollution from site run-off affecting habitat quality and foraging resources</li> </ul>	<ul style="list-style-type: none"> <li>Disturbance/displacement of birds arising from vehicles and workers accessing onshore structures for maintenance</li> </ul>	<ul style="list-style-type: none"> <li>Disturbance/displacement of birds within and outside SPA</li> <li>Pollution from site run-off affecting habitat quality and foraging resources</li> </ul>	<ul style="list-style-type: none"> <li>Risk of disturbance of foraging birds inside the SPA</li> <li>Risk of pollution.</li> </ul>	<b>Potential for LSE on all qualifying features.</b>
Gibraltar Point SPA	4.15	<ul style="list-style-type: none"> <li>Grey plover <i>Pluvialis squatarola</i> (Non-breeding)</li> <li>Sanderling <i>Calidris alba</i> (Non-breeding)</li> <li>Bar-tailed godwit <i>Limosa lapponica</i> (Non-breeding)</li> <li>Little tern <i>Sterna albifrons</i> (Breeding)</li> </ul>	<ul style="list-style-type: none"> <li>Loss of foraging, roosting and nesting habitat within the site and surrounding area</li> <li>Disturbance of birds within and outside the SPA</li> <li>Pollution from site run-off affecting habitat quality</li> </ul>	<ul style="list-style-type: none"> <li>Disturbance/displacement of birds arising from vehicles and workers accessing onshore structures for maintenance</li> </ul>	<ul style="list-style-type: none"> <li>Disturbance/displacement of birds outside SPA</li> <li>Pollution from site run-off affecting habitat quality</li> </ul>	<ul style="list-style-type: none"> <li>Risk of pollution</li> </ul>	<b>Potential for LSE on all qualifying features.</b>
Gibraltar Point Ramsar Site	4.15	Onshore Ramsar Features: <ul style="list-style-type: none"> <li>Ramsar Criterion 1: Coastal habitats – estuarine mudflats, sandbanks, and saltmarsh;</li> <li>Ramsar Criterion 2: Red Data book invertebrates – including:               <ul style="list-style-type: none"> <li><i>Athetis pallustris</i>, (marsh moth, terrestrial)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Loss of, or damage to estuary habitats</li> <li>Loss of foraging and roosting habitat for birds within the site and surrounding area</li> <li>Disturbance of birds within and outside the site</li> </ul>	<ul style="list-style-type: none"> <li>Damage to habitats and disturbance/displacement of birds arising from vehicles and workers accessing onshore structures for maintenance</li> </ul>	<ul style="list-style-type: none"> <li>Loss of or damage to estuary habitats</li> <li>Disturbance/displacement of birds within and outside the site</li> <li>Pollution from site run-off affecting habitat quality</li> </ul>	<ul style="list-style-type: none"> <li>Risk of pollution, affecting aquatic invertebrates, plants and birds</li> <li>Risk of disturbance and loss of foraging and roosting habitat outside the Ramsar site for dark-bellied brent goose</li> </ul>	<b>Potential for LSE on some coastal habitats, waterfowl, invertebrates and plants.</b>

Designated Site	Distance to Onshore ECC (km)	Feature(s) to Consider for Potential LSE	Effects Considered			Consideration of LSE	Conclusion
			Construction	Operations and Maintenance	Decommissioning		
		<ul style="list-style-type: none"> <li>▪ <i>Dexiopsis lacustris</i>, (a fly, terrestrial)</li> <li>▪ <i>Eupithecia extensaria</i> (scarce pug moth, terrestrial)</li> <li>▪ <i>Gymnacyla canella</i> (a moth, terrestrial)</li> <li>▪ <i>Haematapota bigoti</i> (a horsefly, terrestrial)</li> <li>▪ <i>Haliphus mucronatus</i> (a water beetle, aquatic)</li> <li>▪ <i>Phaonia fusca</i> (a fly, terrestrial)</li> <li>▪ <i>Pherbellia dorsata</i> (a snail killing fly, terrestrial)</li> <li>▪ <i>Rymosia connexa</i> (a fly, terrestrial)</li> <li>▪ <i>Salticella fasciata</i> (a snail killing fly, sand dunes)</li> <li>▪ <i>Spilogona biseriata</i> (a fly, terrestrial)</li> <li>▪ <i>Brachytron pratense</i> (hairy dragonfly, aquatic)</li> </ul> <p>Notable plant species, including:</p> <ul style="list-style-type: none"> <li>▪ <i>Althaea officinalis</i> (Marshmallow, emergent)</li> <li>▪ <i>Calystegia soldanella</i> (Sea bindweed, sand dunes)</li> <li>▪ <i>Eryngium maritimus</i> (Sea holly, sand dunes)</li> <li>▪ <i>Festuca arenaria</i> (Rush-leaved fescue, sand dunes)</li> <li>▪ <i>Frankenia laevis</i> (Sea heath, salt marsh)</li> <li>▪ <i>Parapholis incurve</i> (Curved hard-grass, salt marsh, shingle)</li> <li>▪ <i>Ranunculus baudotii</i> (Brackish water crowfoot, ditches etc)</li> <li>▪ <i>Salicornia pusilla</i> (Salicornia, saltmarsh)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Pollution from site run-off affecting habitat quality</li> <li>▪ Loss of or decline in populations of scarce invertebrates and plants</li> </ul>				

Designated Site	Distance to Onshore ECC (km)	Feature(s) to Consider for Potential LSE	Effects Considered			Consideration of LSE	Conclusion
			Construction	Operations and Maintenance	Decommissioning		
		<ul style="list-style-type: none"> <li>▪ <i>Sarcocornia perennis</i> (Perennial glasswort, saltmarsh)</li> <li>▪ <i>Silene maritima</i> (Sea campion, shingle)</li> <li>▪ <i>Suaeda vera</i> (Shrubby sea-blite, shingle)</li> <li>▪ Ramsar Criterion 5: Waterfowl.</li> <li>▪ Ramsar Criterion 6: Grey plover, sanderling, bar-tailed godwit, dark-bellied brent goose.</li> </ul>					
North Norfolk Coast SPA	24	<ul style="list-style-type: none"> <li>▪ Pink-footed goose.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Loss of foraging and roosting habitat for birds outside the SPA</li> <li>▪ Disturbance of birds outside the site.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Disturbance/displacement of birds arising from vehicles and workers accessing onshore structures for maintenance</li> </ul>	<ul style="list-style-type: none"> <li>▪ Disturbance/displacement of birds outside the SPA</li> </ul>	<ul style="list-style-type: none"> <li>▪ Risk of disturbance and loss of foraging and roosting habitat outside the SPA</li> </ul>	<b>Potential for LSE on pink-footed goose.</b>
North Norfolk Coast Ramsar	24	<ul style="list-style-type: none"> <li>▪ Pink-footed goose.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Loss of foraging and roosting habitat for birds outside the SPA</li> <li>▪ Disturbance of birds outside the site</li> </ul>	<ul style="list-style-type: none"> <li>▪ Disturbance/displacement of birds arising from vehicles and workers accessing onshore structures for maintenance</li> </ul>	<ul style="list-style-type: none"> <li>▪ Disturbance/displacement of birds outside the SPA</li> </ul>	<ul style="list-style-type: none"> <li>▪ Risk of disturbance and loss of foraging and roosting habitat outside the SPA</li> </ul>	<b>Potential for LSE on pink-footed goose.</b>

\* Represents a Priority feature



**Legend**

- ES Draft Red Line Boundary
- ES Draft Red Line Boundary 15 km Buffer
- Internationally Designated Sites**
- Special Protection Area (SPA)
- Ramsar
- Special Area of Conservation (SAC)

Sources:  
© Natural England copyright. Contains Ordnance Survey data  
© Crown copyright and database right 2023

Coordinate System: British National Grid  
Scale: 1:350,000

Habitats Regulation Assessment Screening Report  
Onshore Ecology European and Ramsar Sites

Figure 8

**OUTER DOWSING**  
OFFSHORE WIND

Date: 03/10/2023  
Produced By: CLN  
Revision: 0.1

© Crown copyright [and database rights] (2021)  
0100031673

Document Path: \\gis1\as\GIS\Projects\11\Projects\05356 - Outer Dowsing\Tech\GIS\DWG\Wing\2023\10\_HRA\_Screening\_Report\05356\_00012\_0590\_0\_0\Onshore Ecology\European and Ramsar sites.mxd

Figure 5.5: Onshore Ecology European and Ramsar Sites

## 6 In-Combination Assessment

### 6.1 Approach to the In-Combination Assessment

122. Regulation 63 of the Habitats Regulations includes a requirement for the Competent Authority to assess the effects of the project/ proposal alone and/ or in-combination with other plans or projects, where these are not directly connected with or necessary to the management of the site. LSE Screening for the Project alone is undertaken above, with screening for the Project in-combination provided in this section.
123. For screening, where potential for LSE has been identified for the Project alone, then it has also been screened in in-combination. Consideration has also been given to the potential for a LSE in-combination even where the Project alone was insufficient to trigger the threshold for potential LSE.
124. In-combination impacts of the proposed development have been assessed for all projects screened in for alone and/ or in-combination effects to identify where there could be an accumulation of impacts across a number of plans/projects (including the Project) on a sensitive receptor, which could result in the need for further mitigation (for instance a large number of minor effects may coincide to result in an effect of greater severity/ harm overall). These impacts consider other proposed developments within the context of the site and any other reasonably foreseeable proposals in the vicinity including:
- Under construction;
  - Permitted application(s), but not yet implemented;
  - Submitted application(s) not yet determined;
  - Projects on the Planning Inspectorate's Programme of Projects;
  - Identified in the relevant Development Plan (and emerging Development Plans – with appropriate weight being given as they move close to adoption) recognising that much information on any relevant proposals will be limited; and,
  - 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.
125. It is proposed that projects that are built and operational at the time the site was designated have been classified as part of the baseline conditions. Additionally, projects that are built and operational with no continual effects at the time baseline data was collected have also been excluded from the in-combination assessment as their effects are captured within the baseline. However, built and operational projects with ongoing impacts have been considered in-combination.



126. In assessing the potential in-combination impact(s) for the Project, it is important to bear in mind that some projects, predominantly those 'proposed' or identified in development plans etc., may or may not actually be taken forward. There is thus a need to build in some consideration of certainty (or uncertainty) with respect to the potential impacts which might arise from such proposals. For this reason, all relevant projects/plans considered in-combination with the Project are allocated into 'tiers', reflecting their stage within the planning and development process. This allows the in-combination assessment to present several future development scenarios, each with a differing potential for being ultimately built out. A full review of such plans and projects has been conducted for the Project and is presented here and within the RIAA. The types of plans and projects that are considered will include (but may not be limited to) the following:

- Offshore:
  - Relevant renewable energy developments;
  - Relevant offshore oil and gas developments;
  - Relevant pipelines and cable developments;
  - Relevant port and harbour activities (including capital and maintenance dredging);
  - Relevant marine disposal sites; and,
  - Relevant marine dredging sites.
- Onshore:
  - Onshore windfarms;
  - Other energy generation infrastructure;
  - Building/ housing developments;
  - Installation or upgrade of roads;
  - Installation or upgrade of cables and pipelines;
  - Coastal protection works; and,
  - National Grid enabling works.

127. The assessment is undertaken following a tiered structure, using the same tiers as in the wider Project assessments, namely the EIA. Should variation be required on a receptor basis, that will be defined and applied across both the EIA and RIAA. The potential for an in-combination effect will also depend on factors such as timing of works and specifics of works – as not all plans and projects will result in an in-combination effect. Potential plans and projects to include in-combination will therefore be identified for each site identified within the screening distances (Section 4) which has the potential for both the Project and that plan or project(s) to result in an in-combination effect.

128. Full details of the methodology and approach to the in-combination assessments can be found within Section 5 of the Scoping Report (Outer Dowsing Offshore Wind, 2022). In order to generate an initial long list of projects for consideration within the EIA and HRA, a list of distances for each industry sector has been applied for identification of relevant projects which have the potential to have an in-combination effect. The respective distances are set out within the Project Scoping Report (Outer Dowsing Offshore Wind, 2022).
129. Those designated sites considered for the in-combination assessment are presented below in Table 6.1.

Table 6.1: Designated Sites Screened in for the Project In-Combination

Receptor Group	Designated Site	Screened in for In-Combination?
Subtidal and Intertidal Benthic Ecology	North Norfolk Sandbanks and Saturn Reef SAC	<p>This site has been screened in alone for the following effects:</p> <ul style="list-style-type: none"> <li>▪ Suspended sediment/deposition;</li> <li>▪ Indirect Pollution;</li> <li>▪ Accidental Pollution;</li> <li>▪ INNS; and</li> <li>▪ Changes to physical processes.</li> </ul> <p>As these effects are screened in alone, they are automatically screened through for assessment in-combination at Stage 2.</p> <p>Physical habitat loss/ disturbance and EMF effects concluded no potential for LSE alone due to a lack of pathway and therefore are not considered in-combination.</p>
	Inner Dowsing Sandbanks and Saturn Reef SAC	Yes – the site is screened in alone and therefore is considered in-combination at Stage 2.
	The Wash and North Norfolk Coast SAC	Yes – the site is screened in alone and therefore is considered in-combination at Stage 2.
	Humber Estuary Ramsar	Yes – the site is screened in alone and therefore is considered in-combination at Stage 2.
	Humber Estuary SAC	No – this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).
	Gibraltar Point Ramsar	Yes – the site is screened in alone and therefore is considered in-combination at Stage 2.
	The Wash Ramsar	<p>This site has been screened in alone for the following effects:</p> <ul style="list-style-type: none"> <li>▪ Suspended sediment/ deposition;</li> <li>▪ Indirect Pollution;</li> <li>▪ Accidental Pollution;</li> <li>▪ INNS; and</li> <li>▪ Changes to physical processes.</li> </ul> <p>As these effects are screened in alone, they are automatically screened through for assessment in-combination at Stage 2.</p> <p>Physical habitat loss/ disturbance and EMF effects concluded no potential for LSE alone due to a lack of pathway and therefore are not considered in-combination.</p>
Marine Mammals	Southern North Sea SAC	Yes – the site is screened in alone and therefore is considered in-combination at Stage 2.
	Humber Estuary SAC	<p>This site has been screened in alone for the following effects:</p> <ul style="list-style-type: none"> <li>▪ Underwater noise;</li> <li>▪ Vessel disturbance; and</li> <li>▪ Collision risk</li> </ul> <p>As these effects are screened in alone, they are automatically screened through for assessment in-combination at Stage 2.</p> <p>Indirect pollution, accidental pollution, changes to prey, habitat loss, disturbance at haul out, and vessel disturbance effects concluded no potential for LSE alone due to a lack of pathway and therefore are not considered in-combination.</p>
	The Wash and North Norfolk Coast SAC	<p>This site has been screened in alone for the following effects:</p> <ul style="list-style-type: none"> <li>▪ Underwater noise;</li> <li>▪ Vessel disturbance; and,</li> <li>▪ Collision risk.</li> </ul> <p>As these effects are screened in alone, they are automatically screened through for assessment in-combination at Stage 2.</p>

Receptor Group	Designated Site	Screened in for In-Combination?
		Indirect pollution, accidental pollution, changes to prey, habitat loss, disturbance at haul out, and vessel disturbance effects concluded no potential for LSE alone due to a lack of pathway and therefore are not considered in-combination.
	Berwickshire and North Northumberland Coast SAC	<p>This site has been screened in alone for the following effects:</p> <ul style="list-style-type: none"> <li>▪ Underwater noise;</li> <li>▪ Vessel disturbance; and,</li> <li>▪ Collision risk</li> </ul> <p>As these effects are screened in alone, they are automatically screened through for assessment in-combination at Stage 2.</p> <p>Indirect pollution, accidental pollution, changes to prey, habitat loss, disturbance at haul out, and vessel disturbance effects concluded no potential for LSE alone due to a lack of pathway and therefore are not considered in-combination.</p>
	Moray Firth SAC	<p>This site has been screened in alone for the following effects:</p> <ul style="list-style-type: none"> <li>▪ Underwater noise;</li> <li>▪ Vessel disturbance; and,</li> <li>▪ Collision risk.</li> </ul> <p>As these effects are screened in alone, they are automatically screened through for assessment in-combination at Stage 2.</p> <p>Indirect pollution, accidental pollution, changes to prey, habitat loss, disturbance at haul out, and vessel disturbance effects concluded no potential for LSE alone due to a lack of pathway and therefore are not considered in-combination.</p>
	Bancs des Flandres SCA;	<p>The harbour porpoise feature at this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).</p> <p>For both harbour and grey seal species, this site has been screened in alone for the following effects:</p> <ul style="list-style-type: none"> <li>▪ Underwater noise;</li> <li>▪ Vessel disturbance; and,</li> <li>▪ Collision risk.</li> </ul> <p>As these effects are screened in alone, they are automatically screened through for assessment in-combination at Stage 2.</p> <p>Indirect pollution, accidental pollution, changes to prey, habitat loss, disturbance at haul out, and vessel disturbance effects concluded no potential for LSE alone due to a lack of pathway and therefore are not considered in-combination.</p>
	Doggersbank (Netherlands) SAC	<p>The harbour porpoise feature at this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).</p> <p>For both harbour and grey seal species, this site has been screened in alone for the following effects:</p> <ul style="list-style-type: none"> <li>▪ Underwater noise;</li> <li>▪ Vessel disturbance; and,</li> <li>▪ Collision risk.</li> </ul> <p>As these effects are screened in alone, they are automatically screened through for assessment in-combination at Stage 2.</p> <p>Indirect pollution, accidental pollution, changes to prey, habitat loss, disturbance at haul out, and vessel disturbance effects concluded no potential for LSE alone due to a lack of pathway and therefore are not considered in-combination.</p>
	Klaverbak SCI;	The harbour porpoise feature at this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).

Receptor Group	Designated Site	Screened in for In-Combination?
		<p>For both harbour and grey seal species, this site has been screened in alone for the following effects:</p> <ul style="list-style-type: none"> <li>▪ Underwater noise;</li> <li>▪ Vessel disturbance; and,</li> <li>▪ Collision risk.</li> </ul> <p>As these effects are screened in alone, they are automatically considered in-combination at this stage for these features.</p> <p>Indirect pollution, accidental pollution, changes to prey, habitat loss, disturbance at haul out, and vessel disturbance effects concluded no potential for LSE alone due to a lack of pathway and therefore are not considered in-combination at this stage.</p>
	Noordzeekustone SCI;	<p>The harbour porpoise feature at this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).</p> <p>For both harbour and grey seal species, this site has been screened in alone for the following effects:</p> <ul style="list-style-type: none"> <li>▪ Underwater noise;</li> <li>▪ Vessel disturbance; and,</li> <li>▪ Collision risk.</li> </ul> <p>As these effects are screened in alone, they are automatically screened through for assessment in-combination at Stage 2.</p> <p>Indirect pollution, accidental pollution, changes to prey, habitat loss, disturbance at haul out, and vessel disturbance effects concluded no potential for LSE alone due to a lack of pathway and therefore are not considered in-combination.</p>
	SBZ 1 SCI;	<p>The harbour porpoise feature at this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).</p> <p>For both harbour and grey seal species, this site has been screened in alone for the following effects:</p> <ul style="list-style-type: none"> <li>▪ Underwater noise;</li> <li>▪ Vessel disturbance; and,</li> <li>▪ Collision risk.</li> </ul> <p>As these effects are screened in alone, they are automatically screened through for assessment in-combination at Stage 2.</p> <p>Indirect pollution, accidental pollution, changes to prey, habitat loss, disturbance at haul out, and vessel disturbance effects concluded no potential for LSE alone due to a lack of pathway and therefore are not considered in-combination.</p>
	SBZ 2 SCI;	<p>The harbour porpoise feature at this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).</p> <p>For both harbour and grey seal species, this site has been screened in alone for the following effects:</p> <ul style="list-style-type: none"> <li>▪ Underwater noise;</li> <li>▪ Vessel disturbance; and,</li> <li>▪ Collision risk.</li> </ul> <p>As these effects are screened in alone, they are automatically screened through for assessment in-combination at Stage 2.</p> <p>Indirect pollution, accidental pollution, changes to prey, habitat loss, disturbance at haul out, and vessel disturbance effects concluded no potential for LSE alone due to a lack of pathway and therefore are not considered in-combination.</p>

Receptor Group	Designated Site	Screened in for In-Combination?
	SBZ 3 SCI;	<p>The harbour porpoise feature at this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).</p> <p>For both harbour and grey seal species, this site has been screened in alone for the following effects:</p> <ul style="list-style-type: none"> <li>▪ Underwater noise;</li> <li>▪ Vessel disturbance; and,</li> <li>▪ Collision risk.</li> </ul> <p>As these effects are screened in alone, they are automatically screened through for assessment in-combination at Stage 2.</p> <p>Indirect pollution, accidental pollution, changes to prey, habitat loss, disturbance at haul out, and vessel disturbance effects concluded no potential for LSE alone due to a lack of pathway and therefore are not considered in-combination.</p>
	Vlaamse Banked SCI;	<p>The harbour porpoise feature at this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).</p> <p>For both harbour and grey seal species, this site has been screened in alone for the following effects:</p> <ul style="list-style-type: none"> <li>▪ Underwater noise;</li> <li>▪ Vessel disturbance; and,</li> <li>▪ Collision risk.</li> </ul> <p>As these effects are screened in alone, they are automatically screened through for assessment in-combination at Stage 2.</p> <p>Indirect pollution, accidental pollution, changes to prey, habitat loss, disturbance at haul out, and vessel disturbance effects concluded no potential for LSE alone due to a lack of pathway and therefore are not considered in-combination.</p>
	Vlakte van de Raan SCI;	<p>The harbour porpoise feature at this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).</p> <p>For both harbour and grey seal species, this site has been screened in alone for the following effects:</p> <ul style="list-style-type: none"> <li>▪ Underwater noise;</li> <li>▪ Vessel disturbance; and,</li> <li>▪ Collision risk.</li> </ul> <p>As these effects are screened in alone, they are automatically screened through for assessment in-combination at Stage 2.</p> <p>Indirect pollution, accidental pollution, changes to prey, habitat loss, disturbance at haul out, and vessel disturbance effects concluded no potential for LSE alone due to a lack of pathway and therefore are not considered in-combination.</p>
	Voordelta SCI;	<p>The harbour porpoise feature at this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).</p> <p>For both harbour and grey seal species, this site has been screened in alone for the following effects:</p> <ul style="list-style-type: none"> <li>▪ Underwater noise;</li> <li>▪ Vessel disturbance; and,</li> <li>▪ Collision risk.</li> </ul> <p>As these effects are screened in alone, they are automatically screened through for assessment in-combination at Stage 2.</p>

Receptor Group	Designated Site	Screened in for In-Combination?
	Waddenzee SCI; and	<p>Indirect pollution, accidental pollution, changes to prey, habitat loss, disturbance at haul out, and vessel disturbance effects concluded no potential for LSE alone due to a lack of pathway and therefore are not considered in-combination.</p> <p>The harbour porpoise feature at this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).</p> <p>For both harbour and grey seal species, this site has been screened in alone for the following effects:</p> <ul style="list-style-type: none"> <li>▪ Underwater noise;</li> <li>▪ Vessel disturbance; and,</li> <li>▪ Collision risk.</li> </ul> <p>As these effects are screened in alone, they are automatically screened through for assessment in-combination at Stage 2.</p> <p>Indirect pollution, accidental pollution, changes to prey, habitat loss, disturbance at haul out, and vessel disturbance effects concluded no potential for LSE alone due to a lack of pathway and therefore are not considered in-combination.</p>
	Westerschelde & Saeftinghe SCI.	<p>The harbour porpoise feature at this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).</p> <p>For both harbour and grey seal species, this site has been screened in alone for the following effects:</p> <ul style="list-style-type: none"> <li>▪ Underwater noise;</li> <li>▪ Vessel disturbance; and,</li> <li>▪ Collision risk.</li> </ul> <p>As these effects are screened in alone, they are automatically screened through for assessment in-combination at Stage 2.</p> <p>Indirect pollution, accidental pollution, changes to prey, habitat loss, disturbance at haul out, and vessel disturbance effects concluded no potential for LSE alone due to a lack of pathway and therefore are not considered in-combination.</p>
Offshore and Intertidal Ornithology	Greater Wash SPA	Yes – species screened in at this site for potential LSE alone are considered in-combination at Stage 2.
	Humber Estuary Ramsar	Yes – species screened in at this site for potential LSE alone are considered in-combination at Stage 2.
	Humber Estuary SPA	Yes – the site is screened in alone and therefore is considered in-combination at Stage 2.
	North Norfolk Coast SPA	Yes – species screened in at this site for potential LSE alone are considered in-combination at Stage 2.
	Gibraltar Point Ramsar	Yes – species screened in at this site for potential LSE alone are considered in-combination at Stage 2.
	Gibraltar Point SPA	Yes – species screened in at this site for potential LSE alone are considered in-combination at Stage 2.
	The Wash Ramsar	Yes – species screened in at this site for potential LSE alone are considered in-combination at Stage 2.
	The Wash SPA	Yes – species screened in at this site for potential LSE alone are considered in-combination at Stage 2.
	Great Yarmouth North Denes SPA	No – this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).
	Flamborough and Filey Coast SPA	Yes – species screened in at this site for potential LSE alone are considered in-combination at Stage 2.
	Outer Thames Estuary SPA	No – this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).
	Breydon Water Ramsar	No – this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).
	Minsmere-Walberswick Ramsar	No – this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).
	Alde-Ore Estuary Ramsar	No – this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).
	Alde-Ore Estuary SPA	Yes – species screened in at this site for potential LSE alone are considered in-combination at Stage 2.
	Deben Estuary SPA	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	Stour and Orwell Estuaries Ramsar	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	Stour and Orwell Estuaries SPA	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	Hamford Water Ramsar	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	Hamford Water SPA	No – this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).

Receptor Group	Designated Site	Screened in for In-Combination?
	Teessmouth and Cleveland Coast Ramsar	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	Teessmouth and Cleveland Coast SPA	No – this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).
	Colne Estuary (Mid-Essex Coast Phase 2) Ramsar	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	Colne Estuary (Mid-Essex Coast Phase 2) SPA	No – this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).
	Blackwater Estuary (Mid-Essex Coast Phase 4) Ramsar	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	Blackwater Estuary (Mid-Essex Coast Phase 4) SPA	No – this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).
	Dengie (Mid-Essex Coast Phase 1) SPA	No – this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).
	Northumbria Coast Ramsar	No – this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).
	Northumbria Coast SPA	No – this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).
	Foulness (Mid-Essex Coast Phase 5) Ramsar	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	Foulness (Mid-Essex Coast Phase 5) SPA	No – this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).
	Crouch and Roach Estuaries (Mid-Essex Coast Phase 3) Ramsar	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	Crouch and Roach Estuaries (Mid-Essex Coast Phase 3) SPA	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	Benfleet and Southend Marshes Ramsar	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	Benfleet and Southend Marshes SPA	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	Thames Estuary and Marshes Ramsar	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	Thames Estuary and Marshes SPA	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	Medway Estuary and Marshes Ramsar	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	Medway Estuary and Marshes SPA	Yes – species screened in at this site for potential LSE alone are considered in-combination at Stage 2.
	Thanet Coast and Sandwich Bay Ramsar	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	Thanet Coast and Sandwich Bay SPA	No – this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).
	The Swale Ramsar	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	The Swale SPA	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	Northumberland Marine SPA	No – this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).
	Mersey Estuary Ramsar	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	Mersey Estuary SPA	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	Ribble and Alt Estuaries Ramsar	No – this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).
	Ribble and Alt Estuaries SPA	No – this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).
	Coquet Island SPA	Yes – species screened in at this site for potential LSE alone are considered in-combination at Stage 2.
	Morecambe Bay and Duddon Estuary SPA	No – this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).
	Morecambe Bay Ramsar	No – this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).
	Liverpool Bay/ Bae Lerpwl SPA	No – this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).
	Mersey Narrows and North Wirral Foreshore Ramsar	No – this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).
	Mersey Narrows and North Wirral Foreshore SPA	No – this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).
	Dungeness, Romney Marsh and Rye Bay Ramsar	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	Dungeness, Romney Marsh and Rye Bay SPA	No – this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).
	The Dee Estuary Ramsar	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	The Dee Estuary SPA	No – this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).
	Farne Islands SPA	Yes – species screened in at this site for potential LSE alone are considered in-combination at Stage 2.
	Lindisfarne Ramsar	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	Lindisfarne SPA	No – this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).



Receptor Group	Designated Site	Screened in for In-Combination?
	Severn Estuary SPA	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	Upper Solway Flats and Marshes Ramsar	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	Chichester and Langstone Harbours Ramsar	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	Chichester and Langstone Harbours SPA	No – this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).
	Pagham Harbour Ramsar	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	Pagham Harbour SPA	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	Solent and Southampton Water Ramsar	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	Solent and Southampton Water SPA	No – this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).
	Portsmouth Harbour Ramsar	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	Portsmouth Harbour SPA	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	Traeth Lafan/ Lavan Sands, Conway Bay SPA	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	Anglesey Terns/ Morwenoliaid Ynys Môn SPA	No – this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).
	Dyfi Estuary/ Aber Dyfi SPA	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	Northern Cardigan Bay/ Gogledd Bae Ceredigion SPA	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	Firth of Forth Ramsar	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	Firth of Forth SPA	Yes – species screened in at this site for potential LSE alone are considered in-combination at Stage 2.
	Forth Islands SPA	Yes – the site is screened in alone and therefore is considered in-combination at Stage 2.
	Poole Harbour Ramsar	No – this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).
	Poole Harbour SPA	No – this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).
	Imperial Dock Lock, Leith SPA	No – this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).
	Glannau Aberdaron ac Ynys Enlli/ Aberdaron Coast and Bardsey Island SPA	No – this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).
	Firth of Tay and Eden Estuary Ramsar	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	Firth of Tay and Eden Estuary SPA	No – this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).
	Burry Inlet Ramsar	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	Burry Inlet SPA	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	Chesil Beach and The Fleet Ramsar	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	Chesil Beach and The Fleet SPA	No – this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).
	Montrose Basin Ramsar	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	Montrose Basin SPA	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	Calf of Eday SPA	Yes – species screened in at this site for potential LSE alone are considered in-combination at Stage 2.
	Copinsay SPA	Yes – species screened in at this site for potential LSE alone are considered in-combination at Stage 2.
	Bae Caerfyrddin/ Carmarthen Bay SPA	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	Fowlsheugh SPA	Yes – species screened in at this site for potential LSE alone are considered in-combination at Stage 2.
	Outer Ards Ramsar	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	Outer Ards SPA	No – this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).
	Strangford Lough Ramsar	No – this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).
	Strangford Lough SPA	No – this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).
	Inner Clyde Estuary Ramsar	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	Inner Clyde Estuary SPA	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	Ailsa Craig SPA	No – this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).
	Exe Estuary Ramsar	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	Exe Estuary SPA	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	Killough Bay Ramsar	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.

Receptor Group	Designated Site	Screened in for In-Combination?
	Killough Bay SPA	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	Skomer, Skokholm and the Seas off Pembrokeshire/ Sgomer, Sgogwm a Moroedd Penfro SPA	No – this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).
	Ythan Estuary, Sands of Forvie and Meikle Loch SPA	Yes – species screened in at this site for potential LSE alone are considered in-combination at Stage 2.
	Ythan Estuary and Meikle Loch Ramsar	No – this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).
	Belfast Lough Open Water SPA	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	Belfast Lough Ramsar	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	Belfast Lough SPA	No – this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).
	Larne Lough Ramsar	No – this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).
	Larne Lough SPA	No – this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).
	Carlingford Lough Ramsar	No – this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).
	Carlingford Lough SPA	No – this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).
	Grassholm SPA	No – this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).
	Tamar Estuaries Complex SPA	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	Troup, Pennan and Lion's Heads SPA	Yes – species screened in at this site for potential LSE alone are considered in-combination at Stage 2.
	Rathlin Island SPA	No – this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).
	Sheep Island SPA	No – this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).
	Moray and Nairn Coast Ramsar	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	Moray and Nairn Coast SPA	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	The Oa SPA	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	Laggan, Islay SPA	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	Falmouth Bay to St Austell Bay SPA	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	Gruinart Flats, Islay Ramsar	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	Gruinart Flats, Islay SPA	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	North Colonsay and Western Cliffs SPA	No – this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).
	Inner Moray Firth Ramsar	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	Inner Moray Firth SPA	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	Lough Foyle Ramsar	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	Cromarty Firth Ramsar	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	Cromarty Firth SPA	No – this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).
	Lough Foyle SPA	No – this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).
	Dornoch Firth and Loch Fleet Ramsar	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	Dornoch Firth and Loch Fleet SPA	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	East Caithness Cliffs SPA	Yes – species screened in at this site for potential LSE alone are considered in-combination at Stage 2.
	Rum SPA	No – this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).
	Sleibhtean agus Cladach Thiriodh (Tiree Wetlands and Coast) Ramsar	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	North Caithness Cliffs SPA	Yes – species screened in at this site for potential LSE alone are considered in-combination at Stage 2.
	Pentland Firth Islands SPA	No – this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).
	Switha SPA	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	Hoy SPA	Yes – species screened in at this site for potential LSE alone are considered in-combination at Stage 2.
	Auskerry SPA	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	North Sutherland Coastal Islands SPA	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.

Receptor Group	Designated Site	Screened in for In-Combination?
	Mingulay and Berneray SPA	No – this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).
	Handa SPA	No – this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).
	East Sanday Coast Ramsar	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	East Sanday Coast SPA	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	Shiant Isles SPA	No – this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).
	Rousay SPA	Yes – species screened in at this site for potential LSE alone are considered in-combination at Stage 2.
	South Uist Machair and Lochs Ramsar	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	South Uist Machair and Lochs SPA	No – this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).
	Marwick Head SPA	Yes – species screened in at this site for potential LSE alone are considered in-combination at Stage 2.
	Fair Isle SPA	Yes – species screened in at this site for potential LSE alone are considered in-combination at Stage 2.
	West Westray SPA	Yes – species screened in at this site for potential LSE alone are considered in-combination at Stage 2.
	Papa Westray (North Hill and Holm) SPA	No – this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).
	North Uist Machair and Islands Ramsar	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	North Uist Machair and Islands SPA	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	Sule Skerry and Sule Stack SPA	No – this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).
	Sumburgh Head SPA	Yes – species screened in at this site for potential LSE alone are considered in-combination at Stage 2.
	Noss SPA	Yes – species screened in at this site for potential LSE alone are considered in-combination at Stage 2.
	North Rona and Sula Sgeir SPA	No – this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).
	Foula SPA	Yes – species screened in at this site for potential LSE alone are considered in-combination at Stage 2.
	Flannan Isles SPA	No – this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).
	St Kilda SPA	No – this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).
	Papa Stour SPA	No – this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).
	Fetlar SPA	Yes – species screened in at this site for potential LSE alone are considered in-combination at Stage 2.
	Otterswick and Graveland SPA	No – this site is not considered in-combination as concluded no LSE alone due to a negligible number of individuals affected.
	Ramna Stacks and Gruney SPA	No – this site is not considered in-combination as concluded no LSE alone due to a lack of connectivity (no pathway).
	Hermaness, Saxa Vord and Valla Field SPA	Yes – species screened in at this site for potential LSE alone are considered in-combination at Stage 2.
Migratory Fish	Humber Estuary SAC	This site has been screened in alone for underwater noise (construction and decommissioning only) and therefore this effect is screened in in-combination at Stage 2. Suspended sediment/ deposition, indirect pollution, accidental pollution, EMF, INNS, physical habitat loss/ disturbance, and changes to prey all concluded no potential for LSE alone due to a lack of pathway. Therefore, these effects are not considered in-combination at this site.
Onshore Ecology	Humber Estuary SPA	Yes – the site is screened in alone and therefore is considered in-combination at Stage 2.
	Humber Estuary Ramsar site (with sea lamprey and grey seal considered separately)	Yes – the site is screened in alone and therefore is considered in-combination at Stage 2.
	Humber Estuary SAC	Yes – while the Humber Estuary SAC is screened out ‘alone’ due to the distance between the Project and the SAC, and the nature of the habitats, however, there is a risk that pollution arising from the project combines with other sources and therefore LSE cannot be excluded.
	Saltfleetby-Theddlethorpe Dunes & Gibraltar Point SAC	Yes – the site is screened in alone and therefore is considered in-combination at Stage 2.
	The Wash SPA	Yes – the site is screened in alone and therefore is considered in-combination at Stage 2.
	The Wash Ramsar site	Yes – the site is screened in alone and therefore is considered in-combination at Stage 2.
	The Wash & North Norfolk Coast SAC (with common seal considered separately)	Yes – the site is screened in alone and therefore is considered in-combination at Stage 2.
	Greater Wash SPA	Yes – the site is screened in alone and therefore is considered in-combination at Stage 2.
	Gibraltar Point SPA	Yes – the site is screened in alone and therefore is considered in-combination at Stage 2.
	Gibraltar Point Ramsar site	Yes – the site is screened in alone and therefore is considered in-combination at Stage 2.

130. A long list of all potential plans and projects considered relevant to the Project has been developed by the Applicant and is presented within Part 6, Appendix 5.2: Cumulative Effects Assessment Approach Offshore (Document Reference 6.5.2). A precautionary approach has been taken in order to define what plans and projects require consideration for the in-combination screening, in respect of each receptor group. This list of plans and projects for in-combination screening and the rationale for selection for each receptor group is described below.

## 6.2 Subtidal and Intertidal Benthic Ecology

131. The potential for LSE in-combination for subtidal and intertidal benthic ecology is determined based on the following:

- A plan or project which is located within sufficient proximity (15km) to the designated site; this is based on the maximum potential zone of influence associated with increased suspended sediment defined by the tidal ellipses.

132. Based on the above criteria and similar project screening reports, the plans and projects currently proposed to be screened in for the subtidal and intertidal benthic ecology in-combination assessment are presented within Table 6.2.

Table 6.2: Plans and Projects considered for Subtidal and Intertidal Benthic Ecology

Projects	
<b>Offshore Windfarms</b>	
Sheringham Shoal Extension	Triton Knoll
Dudgeon Extension	Dudgeon
Inner Dowsing	Race Bank
Lincs	Lynn
<b>Aggregate Production Areas</b>	
Outer Dowsing Westminster Gravels Ltd (515/2)	Tarmac Marine Ltd (197)
Outer Dowsing Westminster Gravels Ltd (515/1)	Tarmac Marine Ltd (493)
Hanson Aggregates Marine Ltd (106/2)	Tarmac Marine Ltd (481/1)
Hanson Aggregates Marine Ltd (106/3)	Van Oord Ltd (481/2)
Hanson Aggregates Marine Ltd (106/1)	Aggregate area 2103
Hanson Aggregates Marine Ltd (400)	Race Bank Disposal Site
Hanson Aggregates Marine Ltd (1805)	Hornsea Disposal Area 1
<b>Sea Disposal Sites</b>	
Race Bank OWF Disposal Site	
<b>Subsea Cables and Pipelines</b>	
Gas Shearwater to Bacton Seal Line (Total)	Dudgeon OFTO
Viking CCS Pipeline	Race Bank OFTO
Hornsea 1 OFTO	Lincs
Hornsea 2 OFTO	Inner Dowsing
Triton Knoll	Lynn
<b>Oil and Gas Subsurface</b>	

Projects	
Durango 48/21A-4	Pipeline PL370 Cut End Point 1
Pipeline PL370 Cut End Point 2	
Oil and Gas Surface	
48/9A Mimas	
Carbon Capture and Storage (CCS)	
SNS Area 1	SNS Area 8
SNS Area 2	NNS Area 1
SNS Area 3	NNS Area 2
SNS Area 4	EIA Area 1
SNS Area 5	CNS Area 1
SNS Area 6	CNS Area 2
SNS Area 7	

### 6.3 Marine Mammals

133. The potential for LSE in-combination for marine mammals is determined based on the following:

- A plan or project where there is potential for the impacts of the construction and operation and maintenance phases to have a temporal and/or spatial overlap with that of the Project and the plan/ or project is within the relevant range to the designated site (e.g. species-specific MUs or drawn in via potential site connectivity).

134. Based on the above criteria and the currently considered construction dates for the Project (December 2027 - December 2030), the plans and projects screened in for the marine mammal in-combination assessment are presented within Table 6.3.

Table 6.3: Plans and Projects considered for Marine Mammals

Projects	
Offshore Windfarms	
Berwick Bank	Muir Mhor
Blyth Demonstration Phases 2&3	N-10.1 (DE3C)
Borkum Riffgrund 3	N-10.2 (DE3I)
Campion	North Sea Cluster – Nordsee Three (N-3.5)
Cluaran Deas Ear DEME E3	North Sea Cluster – Delta Nordsee 1&2 (N-3.6)
Courseulles-sur-mer	North Sea Cluster – Gode Wind (N-3.7)
Dogger Bank A	North Sea Cluster – Nordsee Two (N-3.8)
Dogger Bank B	Atlantis 1 (N-6.6)
Dogger Bank C	N-6.7
Dogger Bank South (East)	Global Tech II (N-7.2)
Dogger Bank South (West)	N-9.1
Dieppe – Le Treport	N-9.2
Dudgeon Extension	N-9.3
East Anglia 1N	Nordsoen II vest
East Anglia 2	Nordsoen III vest
East Anglia 3	Norfolk Boreas
EnBW He Dreiht	Norfolk Vanguard East
Endurance	Norfolk Vanguard West
Fecamp	North Falls
Five Estuaries	Parc eolien pose au large de la Normandie (AO4)
Forthwind Ltd	Pentland floating demonstrator
Gode Wind 3	Perpetuus Tidal Energy
Hollandse Kust Nord	Rampion 2
Hollandse Kust (West)	SeaGreen Offshore Windfarm
Hollandse Kust (Zuid)	Sheringham Shoal Extension
Hornsea 3	Sofia

Projects	
Hornsea 4	Thor
Inch cape	Vesterhav Nord
Moray west	Vesterhav Syd
Morven BP E1	West of Orkney
Carbon Capture and Storage (CCS)	
SNS Area 1	SNS Area 8
SNS Area 2	NNS Area 1
SNS Area 3	NNS Area 2
SNS Area 4	EIA Area 1
SNS Area 5	CNS Area 1
SNS Area 6	CNS Area 2
SNS Area 7	

## 6.4 Offshore and Intertidal Ornithology

135. The potential for LSE in-combination for offshore and intertidal ornithology is determined based on the following:

- An offshore windfarm (or other infrastructure projects) where there is potential for the construction, operation or decommissioning period to have temporal or spatial overlap with that of the Project.

136. Based on the above criteria and similar project screening reports, the offshore windfarms that are screened in for the offshore and intertidal in-combination assessment are presented within Table 6.4.

Table 6.4: Plans and Projects considered for Offshore and Intertidal Ornithology

Projects	
Offshore Windfarms	
Beatrice	East Anglia Three
Blyth Demonstration Site	Dogger Bank C
Dudgeon	Hornsea Three
East Anglia One	Inch Cape
EOWDC	Moray West
Galloper	Norfolk Boreas
Greater Gabbard	Norfolk Vanguard
Gunfleet Sands	East Anglia ONE North
Hornsea Project One	East Anglia TWO
Hornsea Project Two	Hornsea Four
Humber Gateway	Dudgeon Extension Project
Hywind	Sheringham Shoal Extension Project
Kentish Flats	Rampion 2
Kentish Flats Extension	Berwick Bank
Kincardine	Five Estuaries
Lincs, Lynn & Inner Dowsing	Dogger Bank South (East and West)

Projects	
London Array	Dogger Bank D
Methil	Ayre
Race Bank	Beech
Rampion	Cedar
Scroby Sands	Bellrock
Sheringham Shoal	Bowdun
Teesside	Broadshore
Thanet	Buchan Offshore Wind
Westermost Rough	Caledonia
Triton Knoll	CampionWind
Moray East	Cenos
Neart na Gaoithe	Green Volt
Seagreen Alpha	MarramWind
Seagreen Bravo	Morven
Dogger Bank A	Muir Mhor
Dogger Bank B	Ossian
Sofia	Salamander
Firth of Forth Alpha	Scaraben
Firth of Forth Bravo	Sinclair
Stromar	

## 6.5 Migratory Fish

137. The potential for LSE in-combination for migratory fish is determined based on the following:

- A plan or project which is located within sufficient proximity (100km) to the designated site; this is based on the ranges considered in other OWF in-combination assessments, and the maximum potential zone of influence associated with effects from development.

138. Based on the above criteria and similar project screening reports, the plans and projects screened in for the migratory fish in-combination assessment are presented within Table 6.5.

Table 6.5: Plans and Projects considered for Migratory Fish

Projects	
Offshore Windfarms	
Norfolk Boreas	Race Bank
Sheringham Shoal Extension	Inner Dowsing
Dudgeon Extension	Triton Knoll
Dudgeon	Hornsea Project Three
Lincs	Hornsea Project Four
Aggregate Production Areas	
Westminster Gravels Ltd (515/2)	Hanson Aggregates Marine Ltd (106/1)
Westminster Gravels Ltd (515/1)	Hanson Aggregates Marine Ltd (106/3)
Hanson Aggregates Marine Ltd (106/2)	Tarmac Marine Ltd (493)



Projects	
Hanson Aggregates Marine Ltd (400)	Tarmac Marine Ltd (481/1)
Hanson Aggregates Marine Ltd (1805)	Van Oord Ltd (481/2)
Tarmac Marine Ltd (197)	Aggregate area 2103
Oil and Gas Platforms	
49/11B TETHYS	48/9A MIMAS
Cables and Pipelines	
Eastern Link Cable (National Grid).	
Carbon Capture and Storage	
Endurance	SNS Area 4
SNS Area 2	SNS Area 6
SNS Area 3	SNS Area 7
SNS Area 8	

## 6.6 Onshore Ecology and Ornithology

139. The potential for LSE in-combination for onshore ecology is determined based on the following:

- Plans and projects which overlap with the Order Limits plus 15km and those beyond this area which may have effects on the same European and Ramsar Sites as the Project.

140. Plans that have been screened in for consideration within the in-combination assessment are the adopted and emerging local plans (where available) and Minerals and Waste Plans for the following districts:

- East Lindsey District Council;
- South-East Lincolnshire; and,
- Kings Lynn and West Norfolk.

141. In addition, the following Shoreline Management Plans (SMPs) have been screened in for consideration:

- SMP 3 Flamborough Head to Gibraltar Point. Lead: East Riding Yorkshire Council; and,
- SMP 4 Gibraltar Point to Hunstanton (The Wash). Lead: Environment Agency.

142. The potential for adverse effects on integrity on the National Network Sites in-combination for onshore ecology has been determined within the RIAA considering the national infrastructure projects presented within Table 6.6.

Table 6.6: Plans and Projects considered for Onshore Ecology

Projects	
East Midlands:	
Boston Alternative Energy Facility (BAEF)	Heckington Fen Solar Park
Triton Knoll Electrical System	TIGRE Project 1 (TP1)
Triton Knoll Offshore Windfarm (TKOWF)	Hornsea Project Four

Projects	
Yorkshire & the Humber:	
Orsted Hornsea Project Three	Able Marine Energy Park Material Change 1 - Able Humber Ports Ltd
Hornsea Project Four Offshore Windfarm	Humber Low Carbon Pipelines - National Grid Carbon (NGC)
Dogger Bank South Offshore Windfarms -	Able Marine Energy Park Material Change 2 - Able Humber Ports Ltd
Hornsea - Project Two	North Killingholme Power Project - C.GEN Killingholme Ltd
Hornsea Offshore Windfarm Project One	South Humber Bank Energy Centre - EP Waste Management Limited
Able Marine Energy Park - Able Humber Ports Ltd.	River Humber Gas Pipeline Replacement Project - National Grid
A63 Castle Street Improvement-Hull - Highways England	A160 - A180 Port of Immingham Improvement - Highways Agency
Norfolk and Cambridgeshire	
Medworth Energy from Waste Combined Heat and Power (CHP) Facility - Medworth CHP Limited	

143. In addition, details of relevant planning applications (including those recently consented) has been obtained from the relevant local planning authority databases and considered as part of the 'in-combination' assessment. Relevant planning applications are likely to be those greater than 1 ha in size and with a potential pathway for impact on the same European and Ramsar sites as the Project.

## 7 Conclusion of Potential for LSE (Alone and In-Combination)

### 7.1 Subtidal and Intertidal Benthic Ecology

Table 7.1: Conclusion of LSE for Subtidal and Intertidal Benthic Ecology

Designated Site	Distance to Array (km)	Distance to the Project ECC (km)	Distance to the ANS (km)	Distance to the biogenic reef (km)	Distance to the ORCP (km)	Feature(s) to Consider for Potential LSE	Potential Effects Construction	Operation and Maintenance	Decommissioning	Potential for LSE Alone	Potential for LSE In-Combination
North Norfolk Sandbanks and Saturn Reef SAC	5.9	17.7	0.0	39.5	69.6	<ul style="list-style-type: none"> <li>Reefs; and</li> <li>Sandbanks which are slightly covered by sea water all of the time.</li> </ul>	<ul style="list-style-type: none"> <li>Suspended sediment/deposition;</li> <li>Indirect Pollution;</li> <li>Accidental Pollution;</li> <li>INNS; and</li> <li>Changes to physical processes.</li> </ul>	<ul style="list-style-type: none"> <li>Suspended sediment/deposition;</li> <li>Indirect pollution;</li> <li>Accidental Pollution;</li> <li>INNS; and</li> <li>Changes to physical processes.</li> </ul>	<ul style="list-style-type: none"> <li>Suspended sediment/deposition;</li> <li>Indirect Pollution;</li> <li>Accidental Pollution;</li> <li>INNS; and</li> <li>Changes to physical processes.</li> </ul>	The site is within the maximum range for sediment transport as informed by modelling. The same modelling ranges is considered appropriate for indirect pollution, accidental pollution, and changes to physical processes. The proximity to site also results in the potential for the Project to facilitate the movement of INNS. Therefore, there is a potential for LSE from these effects.	The site is screened in alone and therefore it is also screened through in-combination.
Inner Dowsing, Race Bank and North Ridge SAC	17.8	0.0	30.0	0.0	0.0	<ul style="list-style-type: none"> <li>Reefs; and</li> <li>Sandbanks which are slightly covered by sea water all of the time.</li> </ul>	<ul style="list-style-type: none"> <li>Physical habitat loss/disturbance;</li> <li>Suspended sediment/deposition;</li> <li>Indirect Pollution;</li> <li>Accidental Pollution;</li> <li>INNS; and</li> <li>Changes to physical processes.</li> </ul>	<ul style="list-style-type: none"> <li>Physical habitat loss/disturbance;</li> <li>Suspended sediment/deposition;</li> <li>Indirect Pollution;</li> <li>Accidental Pollution;</li> <li>INNS;</li> <li>Changes to physical processes; and</li> <li>EMF.</li> </ul>	<ul style="list-style-type: none"> <li>Physical habitat loss/disturbance;</li> <li>Suspended sediment/deposition;</li> <li>Indirect Pollution;</li> <li>Accidental Pollution;</li> <li>INNS; and</li> <li>Changes to physical processes.</li> </ul>	The site is within the maximum range for sediment transport as informed by modelling. The same modelling ranges is considered appropriate for indirect pollution, accidental pollution, and changes to physical processes. The proximity to site also results in the potential for the Project to facilitate the movement of INNS. Therefore, there is a potential for LSE from these effects.	The site is screened in alone and therefore it is also screened through in-combination.
The Wash and North Norfolk Coast SAC	48.4	13.4	50.4	0.0	19.3	<ul style="list-style-type: none"> <li>Sandbanks which are slightly covered by sea water all of the time;</li> </ul>	<ul style="list-style-type: none"> <li>Suspended sediment/deposition;</li> <li>Indirect Pollution;</li> <li>Accidental Pollution;</li> </ul>	<ul style="list-style-type: none"> <li>Suspended sediment/deposition;</li> <li>Indirect Pollution;</li> <li>Accidental Pollution;</li> </ul>	<ul style="list-style-type: none"> <li>Suspended sediment/deposition;</li> <li>Indirect Pollution;</li> <li>Accidental Pollution;</li> </ul>	The site is within the maximum range for sediment transport as informed by modelling. The same modelling ranges is considered appropriate for indirect pollution, accidental pollution, and changes to	The site is screened in alone and therefore it is also screened through in-combination.

Designated Site	Distance to Array (km)	Distance to the Project ECC (km)	Distance to the ANS (km)	Distance to the biogenic reef (km)	Distance to the ORCP (km)	Feature(s) to Consider for Potential LSE	Potential Effects Construction	Operation and Maintenance	Decommissioning	Potential for LSE Alone	Potential for LSE In-Combination
						<ul style="list-style-type: none"> <li>Mudflats and sandflats not covered by seawater at low tide;</li> <li>Large shallow inlets and bays;</li> <li>Reefs;</li> <li>Salicornia and other annuals colonizing mud and sand; and</li> <li>Atlantic salt meadows (<i>Glaucopuccinellia maritima</i>).</li> </ul>	<ul style="list-style-type: none"> <li>INNS; and</li> <li>Changes to physical processes.</li> </ul>	<ul style="list-style-type: none"> <li>INNS; and</li> <li>Changes to physical processes.</li> </ul>	<ul style="list-style-type: none"> <li>INNS; and</li> <li>Changes to physical processes.</li> </ul>	physical processes. The proximity to site also results in the potential for the Project to facilitate the movement of INNS. Therefore, there is a potential for LSE from these effects.	
Humber Estuary Ramsar	54.0	12.1	47.5	18.2	15.3	<ul style="list-style-type: none"> <li>Dune systems with humid dune slacks,</li> <li>Estuarine waters;</li> <li>Intertidal mud and sand flats;</li> <li>Saltmarshes; and</li> <li>Coastal brackish/saline lagoons.</li> </ul>	<ul style="list-style-type: none"> <li>Suspended sediment/deposition;</li> <li>Indirect Pollution;</li> <li>Accidental Pollution;</li> <li>INNS; and</li> <li>Changes to physical processes.</li> </ul>	<ul style="list-style-type: none"> <li>Suspended sediment/deposition;</li> <li>Indirect Pollution;</li> <li>Accidental Pollution;</li> <li>INNS; and</li> <li>Changes to physical processes.</li> </ul>	<ul style="list-style-type: none"> <li>Suspended sediment/deposition;</li> <li>Indirect Pollution;</li> <li>Accidental Pollution;</li> <li>INNS; and</li> <li>Changes to physical processes.</li> </ul>	The site is within the maximum range for sediment transport as informed by modelling. The same modelling ranges is considered appropriate for indirect pollution, accidental pollution, and changes to physical processes. The proximity to site also results in the potential for the Project to facilitate the movement of INNS. Therefore, there is a potential for LSE from these effects.	The site is screened in alone and therefore it is also screened through in-combination.
Humber Estuary SAC	54.4	18.5	47.5	23.8	19.7	<ul style="list-style-type: none"> <li>Estuaries;</li> <li>Mudflats and sandflats not covered by</li> </ul>	<ul style="list-style-type: none"> <li>Physical habitat loss/disturbance;</li> </ul>	<ul style="list-style-type: none"> <li>Physical habitat loss/disturbance;</li> </ul>	<ul style="list-style-type: none"> <li>Physical habitat loss/disturbance;</li> </ul>	The site is within the maximum range for sediment transport as informed by modelling. The same modelling ranges is considered appropriate for	The site is screened in alone and therefore it is also screened through in-combination.

Designated Site	Distance to Array (km)	Distance to the Project ECC (km)	Distance to the ANS (km)	Distance to the biogenic reef (km)	Distance to the ORCP (km)	Feature(s) to Consider for Potential LSE	Potential Effects Construction	Operation and Maintenance	Decommissioning	Potential for LSE Alone	Potential for LSE In-Combination
						<ul style="list-style-type: none"> <li>seawater at low tide;</li> <li>Sandbanks which are slightly covered by sea water all the time;</li> <li>Salicornia and other annuals colonizing mud and sand; and</li> <li>Atlantic salt meadows.</li> </ul>	<ul style="list-style-type: none"> <li>Suspended sediment/deposition;</li> <li>Indirect Pollution;</li> <li>Accidental Pollution;</li> <li>INNS; and</li> <li>Changes to physical processes.</li> </ul>	<ul style="list-style-type: none"> <li>Suspended sediment/deposition;</li> <li>Indirect Pollution;</li> <li>Accidental Pollution;</li> <li>INNS; and</li> <li>Changes to physical processes.</li> </ul>	<ul style="list-style-type: none"> <li>Suspended sediment/deposition;</li> <li>Indirect Pollution;</li> <li>Accidental Pollution;</li> <li>INNS; and</li> <li>Changes to physical processes.</li> </ul>	indirect pollution, accidental pollution, and changes to physical processes. The proximity to site also results in the potential for the Project to facilitate the movement of INNS. Therefore, there is a potential for LSE from these effects.	
Gibraltar Point Ramsar	63.1	13.3	70.5	1.6	19.3	<ul style="list-style-type: none"> <li>Estuarine mudflats;</li> <li>Sandbanks;</li> <li>Saltmarsh; and</li> <li>Dunes.</li> </ul>	<ul style="list-style-type: none"> <li>Suspended sediment/deposition;</li> <li>Indirect Pollution;</li> <li>Accidental Pollution;</li> <li>INNS; and</li> <li>Changes to physical processes.</li> </ul>	<ul style="list-style-type: none"> <li>Suspended sediment/deposition;</li> <li>Indirect Pollution;</li> <li>Accidental Pollution;</li> <li>INNS; and</li> <li>Changes to physical processes.</li> </ul>	<ul style="list-style-type: none"> <li>Suspended sediment/deposition;</li> <li>Indirect Pollution;</li> <li>Accidental Pollution;</li> <li>INNS; and</li> <li>Changes to physical processes.</li> </ul>	The site is within the maximum range for sediment transport as informed by modelling. The same modelling ranges is considered appropriate for indirect pollution, accidental pollution, and changes to physical processes. The proximity to site also results in the potential for the Project to facilitate the movement of INNS. Therefore, there is a potential for LSE from these effects.	The site is screened in alone and therefore it is also screened through in-combination.
The Wash Ramsar	66.5	16.4	74.0	3.8	22.7	<ul style="list-style-type: none"> <li>Saltmarshes;</li> <li>Estuaries;</li> <li>Major intertidal banks of sand and mud;</li> <li>Shallow water; and</li> <li>Deep channels.</li> </ul>	<ul style="list-style-type: none"> <li>Physical habitat loss/disturbance;</li> <li>Suspended sediment/deposition;</li> <li>Indirect Pollution;</li> <li>Accidental Pollution;</li> <li>INNS; and</li> </ul>	<ul style="list-style-type: none"> <li>Physical habitat loss/disturbance;</li> <li>Suspended sediment/deposition;</li> <li>Indirect Pollution;</li> <li>Accidental Pollution;</li> <li>INNS; and</li> </ul>	<ul style="list-style-type: none"> <li>Physical habitat loss/disturbance;</li> <li>Suspended sediment/deposition;</li> <li>Indirect Pollution;</li> <li>Accidental Pollution;</li> <li>INNS; and</li> </ul>	The site is within the maximum range for sediment transport as informed by modelling. The same modelling ranges is considered appropriate for indirect pollution, accidental pollution, and changes to physical processes. The proximity to site also results in the potential for the Project to facilitate the movement of INNS. Therefore, there is a	The site is screened in alone and therefore it is also screened through in-combination.

Designated Site	Distance to Array (km)	Distance to the Project ECC (km)	Distance to the ANS (km)	Distance to the biogenic reef (km)	Distance to the ORCP (km)	Feature(s) to Consider for Potential LSE	Potential Effects Construction	Operation and Maintenance	Decommissioning	Potential for LSE Alone	Potential for LSE In-Combination
							<ul style="list-style-type: none"> <li>Changes to physical processes.</li> </ul>	<ul style="list-style-type: none"> <li>Changes to physical processes.</li> </ul>	<ul style="list-style-type: none"> <li>Changes to physical processes.</li> </ul>	potential for LSE from these effects.	

## 7.2 Marine Mammals

Table 7.2: Conclusion of LSE for Marine Mammals

Designated Site	MU	Distance to Array (km)	Distance to the Project ECC (km)	Distance to the ANS (km)	Distance to the biogenic reef (km)	Distance to the ORCP (km)	Feature(s) to Consider for Potential LSE	Potential Effects Construction	Operation and Maintenance	Decommissioning	Potential for LSE Alone	Potential for LSE In-Combination
Southern North Sea SAC	North Sea Harbour Porpoise MU	0.0	1.1	0.0	34.7	42.3	Harbour Porpoise ( <i>Phocoena phocoena</i> )	<ul style="list-style-type: none"> <li>Underwater noise;</li> <li>Vessel disturbance;</li> <li>Collision risk;</li> <li>Indirect pollution;</li> <li>Accidental pollution;</li> <li>Habitat loss; and</li> <li>Changes to prey.</li> </ul>	<ul style="list-style-type: none"> <li>Underwater noise;</li> <li>Vessel disturbance;</li> <li>Collision risk;</li> <li>Indirect Pollution;</li> <li>Accidental pollution;</li> <li>Habitat loss; and</li> <li>Changes to prey.</li> </ul>	<ul style="list-style-type: none"> <li>Underwater noise;</li> <li>Vessel disturbance;</li> <li>Collision risk;</li> <li>Indirect Pollution;</li> <li>Accidental pollution;</li> <li>Habitat loss; and</li> <li>Changes to prey.</li> </ul>	Potential for LSE. The site is within the maximum range for these effects as informed by modelling and therefore there is a potential for an LSE.	The site is screened in alone and therefore it is also screened through in-combination.
Humber Estuary SAC	Southeast England Seal MU	54.4	18.5	47.5	23.8	19.7	Grey Seal ( <i>Halichoerus grypus</i> )	<ul style="list-style-type: none"> <li>Underwater noise;</li> <li>Vessel disturbance;</li> <li>Changes to prey;</li> <li>Disturbance at haul out; and</li> <li>Collision risk.</li> </ul>	<ul style="list-style-type: none"> <li>Underwater noise;</li> <li>Vessel disturbance;</li> <li>Changes to prey;</li> <li>Disturbance at haul out; and</li> <li>Collision risk.</li> </ul>	<ul style="list-style-type: none"> <li>Underwater noise;</li> <li>Vessel disturbance;</li> <li>Changes to prey;</li> <li>Disturbance at haul out; and</li> <li>Collision risk.</li> </ul>	The site is within the maximum range for these effects as informed by modelling and therefore there is a potential for an LSE.	The site is screened in alone and therefore it is also screened through in-combination.
Humber Estuary Ramsar	Southeast England Seal MU	54.0	12.1	47.5	18.2	15.3	Grey Seal ( <i>Halichoerus grypus</i> )	<ul style="list-style-type: none"> <li>Underwater noise;</li> <li>Vessel disturbance;</li> <li>Changes to prey;</li> </ul>	<ul style="list-style-type: none"> <li>Underwater noise;</li> <li>Vessel disturbance;</li> <li>Changes to prey;</li> </ul>	<ul style="list-style-type: none"> <li>Underwater noise;</li> <li>Vessel disturbance;</li> <li>Changes to prey;</li> </ul>	The site is within the maximum range for these effects as informed by modelling and therefore there is a potential for an LSE.	The site is screened in alone and therefore it is also screened through in-combination.

Designated Site	MU	Distance to Array (km)	Distance to the Project ECC (km)	Distance to the ANS (km)	Distance to the biogenic reef (km)	Distance to the ORCP (km)	Feature(s) to Consider for Potential LSE	Potential Effects Construction	Operation and Maintenance	Decommissioning	Potential for LSE Alone	Potential for LSE In-Combination
								<ul style="list-style-type: none"> <li>Disturbance at haul out; and</li> <li>Collision risk.</li> </ul>	<ul style="list-style-type: none"> <li>Disturbance at haul out; and</li> <li>Collision risk.</li> </ul>	<ul style="list-style-type: none"> <li>Disturbance at haul out; and</li> <li>Collision risk.</li> </ul>		
The Wash and North Norfolk Coast SAC	Southeast England Seal MU	48.4	13.4	50.4	0.0	19.3	Harbour Seal ( <i>Phoca vitulina</i> )	<ul style="list-style-type: none"> <li>Underwater noise;</li> <li>Vessel disturbance;</li> <li>Changes to prey; and</li> <li>Collision risk.</li> </ul>	<ul style="list-style-type: none"> <li>Underwater noise;</li> <li>Vessel disturbance;</li> <li>Changes to prey; and</li> <li>Collision risk.</li> </ul>	<ul style="list-style-type: none"> <li>Underwater noise;</li> <li>Vessel disturbance;</li> <li>Changes to prey; and</li> <li>Collision risk.</li> </ul>	The site is within the maximum range for these effects as informed by modelling and therefore there is a potential for an LSE.	The site is screened in alone and therefore it is also screened through in-combination.
Berwickshire and North Northumberland Coast SAC	Northeast England Seal MU	260.4	262.0	232.6	259.2	262.0	Grey Seal ( <i>Halichoerus grypus</i> )	<ul style="list-style-type: none"> <li>Underwater noise;</li> <li>Vessel disturbance;</li> <li>Changes to prey; and</li> <li>Collision risk.</li> </ul>	<ul style="list-style-type: none"> <li>Underwater noise;</li> <li>Vessel disturbance;</li> <li>Changes to prey; and</li> <li>Collision risk.</li> </ul>	<ul style="list-style-type: none"> <li>Underwater noise;</li> <li>Vessel disturbance;</li> <li>Changes to prey; and</li> <li>Collision risk.</li> </ul>	Evidence to suggest connectivity (Vincent <i>et al.</i> , 2017) and therefore effects cannot be screened out at this stage and therefore there is a potential for LSE.	The site is screened in alone and therefore it is also screened through in-combination.
Moray Firth SAC	Coastal East Scotland MU	515.0	525.5	487.0	521.2	525.5	Bottlenose dolphin ( <i>Tursiops truncatus</i> )	<ul style="list-style-type: none"> <li>Underwater noise;</li> <li>Vessel disturbance;</li> <li>Collision risk; and</li> <li>Changes to prey.</li> </ul>	<ul style="list-style-type: none"> <li>Underwater noise;</li> <li>Vessel disturbance;</li> <li>Collision risk; and</li> <li>Changes to prey.</li> </ul>	<ul style="list-style-type: none"> <li>Underwater noise;</li> <li>Vessel disturbance;</li> <li>Collision risk; and</li> <li>Changes to prey.</li> </ul>	Potential for site connectivity is indicated from photo-identification data. Therefore, there is the potential for some level of interaction between bottlenose dolphin associated with the Moray Firth SAC and these effects from the project.	The site is screened in alone and therefore it is also screened through in-combination.
Transboundary sites for seals; Bancs des Flandres SAC; Doggersbank (Netherlands) SAC Klaverbak SCI;	Various	Various	Various	Various	Various	Various	Harbour seal; and Grey seal	<ul style="list-style-type: none"> <li>Underwater noise;</li> <li>Vessel disturbance;</li> <li>Changes to prey; and</li> <li>Collision risk.</li> </ul>	<ul style="list-style-type: none"> <li>Underwater noise;</li> <li>Vessel disturbance;</li> <li>Changes to prey; and</li> <li>Collision risk.</li> </ul>	<ul style="list-style-type: none"> <li>Underwater noise;</li> <li>Vessel disturbance;</li> <li>Changes to prey; and</li> <li>Collision risk.</li> </ul>	The site is within the maximum range for these effects as informed by modelling and therefore there is a potential for an LSE.	The sites are screened in alone and therefore they are also screened through in-combination

Designated Site	MU	Distance to Array (km)	Distance to the Project ECC (km)	Distance to the ANS (km)	Distance to the biogenic reef (km)	Distance to the ORCP (km)	Feature(s) to Consider for Potential LSE	Potential Effects			Potential for LSE Alone	Potential for LSE In-Combination
								Construction	Operation and Maintenance	Decommissioning		
Noordzee kustone SCI; SBZ 1 SCI; SBZ 2 SCI; SBZ 3 SCI; Vlaamse Banked SCI; Vlake van de Raan SCI; Voordelta SCI; Waddenze SCI; and Westerschelde & Saeftinghe SCI.												

### 7.3 Offshore and Intertidal Ornithology

Table 7.3: Conclusion of LSE for Offshore and Intertidal Ornithology

Designated Site	Distance to Array (km)	Distance to the Project ECC (km)	Distance to the ANS (km)	Distance to the biogenic reef (km)	Distance to the ORCP (km)	Feature(s) to Consider for Potential LSE	Potential Effects			Potential for LSE
							Construction	Operation and Maintenance	Decommissioning	
Greater Wash SPA	24.6	0.0	24.0	0.0	0.0	<ul style="list-style-type: none"> <li>▪ Red-throated diver; and</li> <li>▪ Common scoter.</li> <li>▪ Little gull;</li> <li>▪ Little tern;</li> <li>▪ Common tern; and</li> <li>▪ Sandwich tern.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Direct disturbance and displacement due to the presence of the array infrastructure, work activity and vessel movements in both the offshore and intertidal zones</li> </ul>	<ul style="list-style-type: none"> <li>▪ Collisions for migratory waterbirds</li> </ul>	Evidence to suggest connectivity and therefore effects cannot be screened out at this stage and therefore there is a potential for LSE.	



Designated Site	Distance to Array (km)	Distance to the Project ECC (km)	Distance to the ANS (km)	Distance to the biogenic reef (km)	Distance to the ORCP (km)	Feature(s) to Consider for Potential LSE	Potential Effects			Potential for LSE
							Construction	Operation and Maintenance	Decommissioning	
Humber Estuary SPA and Ramsar	54.0	12.1	47.5	18.2	15.3	<ul style="list-style-type: none"> <li>▪ Avocet;</li> <li>▪ Bar-tailed godwit;</li> <li>▪ Bittern;</li> <li>▪ Black-tailed godwit;</li> <li>▪ Dunlin;</li> <li>▪ Golden plover;</li> <li>▪ Hen harrier;</li> <li>▪ Knot;</li> <li>▪ Little tern;</li> <li>▪ Marsh harrier;</li> <li>▪ Redshank; Ruff;</li> <li>▪ Shelduck;</li> <li>▪ Pink-footed goose;</li> <li>▪ Wigeon;</li> <li>▪ Ringed plover;</li> <li>▪ Curlew;</li> <li>▪ Sanderling;</li> <li>▪ Oystercatcher;</li> <li>▪ Dark-bellied brent goose;</li> <li>▪ Mallard;</li> <li>▪ Pochard;</li> <li>▪ Goldeneye; and</li> <li>▪ Scaup.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Direct disturbance and displacement due to the presence of the array infrastructure, work activity and vessel movements in both the offshore and intertidal zones (all migratory waterbirds).</li> </ul>			Evidence to suggest connectivity and therefore effects cannot be screened out at this stage and therefore there is a potential for LSE.
North Norfolk Coast SPA						<ul style="list-style-type: none"> <li>▪ Dark-bellied brent goose;</li> <li>▪ Eurasian marsh harrier;</li> <li>▪ Eurasian wigeon;</li> <li>▪ Great bittern;</li> <li>▪ Pied avocet;</li> <li>▪ Pink-footed goose;</li> <li>▪ Red knot;</li> <li>▪ Sandwich tern;</li> <li>▪ Common tern;</li> <li>▪ Little tern; and</li> </ul>	<ul style="list-style-type: none"> <li>▪ Barrier effects for migratory waterbirds; and</li> <li>▪ Collisions for migratory waterbirds.</li> </ul>			Evidence to suggest connectivity and therefore effects cannot be screened out at this stage and therefore there is a potential for LSE.

Designated Site	Distance to Array (km)	Distance to the Project ECC (km)	Distance to the ANS (km)	Distance to the biogenic reef (km)	Distance to the ORCP (km)	Feature(s) to Consider for Potential LSE	Potential Effects			Potential for LSE
							Construction	Operation and Maintenance	Decommissioning	
Gibraltar Point Ramsar						<ul style="list-style-type: none"> <li>Assemblage features.</li> <li>Grey plover;</li> <li>Sanderling;</li> <li>Dark-bellied brent goose; and</li> <li>Bar-tailed godwit.</li> </ul>	<ul style="list-style-type: none"> <li>Barrier effects for migratory waterbirds; and</li> <li>Collisions for migratory waterbirds.</li> </ul>			Evidence to suggest connectivity and therefore effects cannot be screened out at this stage and therefore there is a potential for LSE.
Gibraltar Point SPA						<ul style="list-style-type: none"> <li>Bar-tailed godwit;</li> <li>Grey plover; and</li> <li>Sanderling</li> <li>Little tern.</li> </ul>	<ul style="list-style-type: none"> <li>Barrier effects for migratory waterbirds; and</li> <li>Collisions for migratory waterbirds.</li> </ul>			Evidence to suggest connectivity and therefore effects cannot be screened out at this stage and therefore there is a potential for LSE.
The Wash Ramsar						<ul style="list-style-type: none"> <li>Eurasian oystercatcher;</li> <li>Grey plover;</li> <li>Red knot;</li> <li>Sanderling;</li> <li>Eurasian curlew;</li> <li>Common redshank;</li> <li>Ruddy turnstone;</li> <li>Pink-footed goose;</li> <li>Dark-bellied brent goose;</li> <li>Common shelduck;</li> <li>Northern pintail;</li> <li>Dunlin; and</li> <li>Bar-tailed godwit.</li> </ul>	<ul style="list-style-type: none"> <li>Barrier effects for migratory waterbirds; and</li> <li>Collisions for migratory waterbirds.</li> </ul>			Evidence to suggest connectivity and therefore effects cannot be screened out at this stage and therefore there is a potential for LSE.
The Wash SPA						<ul style="list-style-type: none"> <li>Bar-tailed godwit;</li> <li>Common scoter;</li> <li>Black-tailed godwit;</li> <li>Common goldeneye;</li> </ul>	<ul style="list-style-type: none"> <li>Barrier effects for migratory waterbirds; and</li> <li>Collisions for migratory waterbirds.</li> </ul>			Evidence to suggest connectivity and therefore effects cannot be screened out at this stage and therefore there is a potential for LSE

Designated Site	Distance to Array (km)	Distance to the Project ECC (km)	Distance to the ANS (km)	Distance to the biogenic reef (km)	Distance to the ORCP (km)	Feature(s) to Consider for Potential LSE	Potential Effects			Potential for LSE
							Construction	Operation and Maintenance	Decommissioning	
						<ul style="list-style-type: none"> <li>▪ Common redshank;</li> <li>▪ Common shelduck;</li> <li>▪ Dark-bellied brent goose;</li> <li>▪ Dunlin;</li> <li>▪ Eurasian curlew;</li> <li>▪ Eurasian oystercatcher;</li> <li>▪ Eurasian wigeon;</li> <li>▪ Gadwall;</li> <li>▪ Grey plover;</li> <li>▪ Northern pintail;</li> <li>▪ Pink-footed goose;</li> <li>▪ Red knot;</li> <li>▪ Ruddy turnstone;</li> <li>▪ Sanderling;</li> <li>▪ Tundra swan;</li> <li>▪ Common tern</li> <li>▪ Little tern; and</li> <li>▪ Assemblage features.</li> </ul>				
Flamborough and Filey Coast SPA	93.5	92.0	70.4	88.8	92.0	<ul style="list-style-type: none"> <li>▪ Kittiwake; and</li> <li>▪ Gannet.</li> </ul>	<ul style="list-style-type: none"> <li>▪ N/A</li> </ul>	<ul style="list-style-type: none"> <li>▪ Collision risk due to the presence of turbines.</li> </ul>	<ul style="list-style-type: none"> <li>▪ N/A</li> </ul>	Evidence to suggest connectivity and therefore effects cannot be screened out at this stage and therefore there is a potential for LSE.
						<ul style="list-style-type: none"> <li>▪ Guillemot;</li> <li>▪ Razorbill;</li> <li>▪ Gannet; and</li> <li>▪ Puffin.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Direct disturbance and displacement due to the presence of the array infrastructure, work activity and vessel movements in both the offshore and intertidal zones.</li> </ul>			Evidence to suggest connectivity and therefore effects cannot be screened out at this stage and therefore there is a potential for LSE.
Alde-Ore Estuary SPA and Ramsar	147.4	131.3	136.2	110.4	139.2	<ul style="list-style-type: none"> <li>▪ Lesser black-backed gull.</li> </ul>	<ul style="list-style-type: none"> <li>▪ N/a</li> </ul>	<ul style="list-style-type: none"> <li>▪ Collision risk due to the presence of turbines.</li> </ul>	<ul style="list-style-type: none"> <li>▪ N/a</li> </ul>	Evidence to suggest connectivity and therefore effects

Designated Site	Distance to Array (km)	Distance to the Project ECC (km)	Distance to the ANS (km)	Distance to the biogenic reef (km)	Distance to the ORCP (km)	Feature(s) to Consider for Potential LSE	Potential Effects			Potential for LSE
							Construction	Operation and Maintenance	Decommissioning	
										cannot be screened out at this stage and therefore there is a potential for LSE.
Coquet Island SPA	258.6	258.8	231.0	256.3	258.8	<ul style="list-style-type: none"> <li>Puffin.</li> </ul>	<ul style="list-style-type: none"> <li>Direct disturbance and displacement due to the presence of the array infrastructure, work activity and vessel movements in both the offshore and intertidal zones.</li> </ul>			Evidence to suggest connectivity and therefore effects cannot be screened out at this stage and therefore there is a potential for LSE.
						<ul style="list-style-type: none"> <li>Sandwich tern</li> </ul>	<ul style="list-style-type: none"> <li>N/a</li> </ul>	<ul style="list-style-type: none"> <li>Collision risk due to the presence of turbines.</li> </ul>	<ul style="list-style-type: none"> <li>N/a</li> </ul>	
Farne Islands SPA	285.8	289.1	257.9	285.9	289.1	<ul style="list-style-type: none"> <li>Kittiwake; and</li> <li>Sandwich tern.</li> </ul>	<ul style="list-style-type: none"> <li>N/a</li> </ul>	<ul style="list-style-type: none"> <li>Collision risk due to the presence of turbines.</li> </ul>	<ul style="list-style-type: none"> <li>N/a</li> </ul>	Evidence to suggest connectivity and therefore effects cannot be screened out at this stage and therefore there is a potential for LSE.
						<ul style="list-style-type: none"> <li>Guillemot; and</li> <li>Puffin.</li> </ul>	<ul style="list-style-type: none"> <li>Direct disturbance and displacement due to the presence of the array infrastructure, work activity and vessel movements in both the offshore and intertidal zones.</li> </ul>			
Forth Islands SPA	363.7	363.4	335.9	361.2	363.4	<ul style="list-style-type: none"> <li>Guillemot;</li> <li>Razorbill;</li> <li>Puffin; and</li> <li>Gannet.</li> </ul>	<ul style="list-style-type: none"> <li>Direct disturbance and displacement due to the presence of the array infrastructure, work activity and vessel movements in both the offshore and intertidal zones.</li> </ul>			Evidence to suggest connectivity and therefore effects cannot be screened out at this stage and therefore there is a potential for LSE.
						<ul style="list-style-type: none"> <li>Kittiwake; and</li> <li>Gannet.</li> </ul>	<ul style="list-style-type: none"> <li>N/a</li> </ul>	<ul style="list-style-type: none"> <li>Collision risk due to the presence of turbines.</li> </ul>	<ul style="list-style-type: none"> <li>N/a</li> </ul>	
Fowlsheugh SPA	421.5	430.9	393.4	426.7	430.9	<ul style="list-style-type: none"> <li>Guillemot; and</li> <li>Razorbill</li> </ul>	<ul style="list-style-type: none"> <li>Direct disturbance and displacement due to the presence of the array infrastructure, work activity and vessel movements in both the offshore and intertidal zones.</li> </ul>			Evidence to suggest connectivity and therefore effects cannot be screened out at this stage and therefore there is a potential for LSE.
						<ul style="list-style-type: none"> <li>Kittiwake</li> </ul>	<ul style="list-style-type: none"> <li>N/a</li> </ul>	<ul style="list-style-type: none"> <li>Collision risk due to the presence of turbines.</li> </ul>	<ul style="list-style-type: none"> <li>N/a</li> </ul>	
Ythan Estuary, Sands of Forvie and	443.1	454.6	415.1	450.0	454.6	<ul style="list-style-type: none"> <li>Guillemot; and</li> <li>Razorbill</li> </ul>	<ul style="list-style-type: none"> <li>Direct disturbance and displacement due to the presence of the array infrastructure, work activity and vessel movements in both the offshore and intertidal zones.</li> </ul>			Evidence to suggest connectivity and therefore effects cannot be screened out at this

Designated Site	Distance to Array (km)	Distance to the Project ECC (km)	Distance to the ANS (km)	Distance to the biogenic reef (km)	Distance to the ORCP (km)	Feature(s) to Consider for Potential LSE	Potential Effects			Potential for LSE
							Construction	Operation and Maintenance	Decommissioning	
Meikle Loch SPA						<ul style="list-style-type: none"> <li>Kittiwake</li> </ul>	<ul style="list-style-type: none"> <li>N/a</li> </ul>	<ul style="list-style-type: none"> <li>Collision risk due to the presence of turbines.</li> </ul>	<ul style="list-style-type: none"> <li>N/a</li> </ul>	stage and therefore there is a potential for LSE.
Buchan Ness to Collieston Coast SPA	456.6	469.8	433.8	464.8	469.8	<ul style="list-style-type: none"> <li>Guillemot</li> </ul>	<ul style="list-style-type: none"> <li>Direct disturbance and displacement due to the presence of the array infrastructure, work activity and vessel movements in both the offshore and intertidal zones.</li> </ul>			Evidence to suggest connectivity and therefore effects cannot be screened out at this stage and therefore there is a potential for LSE.
						<ul style="list-style-type: none"> <li>Kittiwake</li> </ul>	<ul style="list-style-type: none"> <li>N/a</li> </ul>	<ul style="list-style-type: none"> <li>Collision risk due to the presence of turbines.</li> </ul>	<ul style="list-style-type: none"> <li>N/a</li> </ul>	
Troup, Pennan and Lion's Heads SPA	498.4	511.7	470.5	506.8	511.7	<ul style="list-style-type: none"> <li>Guillemot; and</li> <li>Razorbill</li> </ul>	<ul style="list-style-type: none"> <li>Direct disturbance and displacement due to the presence of the array infrastructure, work activity and vessel movements in both the offshore and intertidal zones.</li> </ul>			Evidence to suggest connectivity and therefore effects cannot be screened out at this stage and therefore there is a potential for LSE.
						<ul style="list-style-type: none"> <li>Kittiwake</li> </ul>	<ul style="list-style-type: none"> <li>N/a</li> </ul>	<ul style="list-style-type: none"> <li>Collision risk due to the presence of turbines.</li> </ul>	<ul style="list-style-type: none"> <li>N/a</li> </ul>	
East Caithness Cliffs SPA	582.4	590.9	554.4	587.0	590.9	<ul style="list-style-type: none"> <li>Guillemot; and</li> <li>Razorbill</li> </ul>	<ul style="list-style-type: none"> <li>Direct disturbance and displacement due to the presence of the array infrastructure, work activity and vessel movements in both the offshore and intertidal zones.</li> </ul>			Evidence to suggest connectivity and therefore effects cannot be screened out at this stage and therefore there is a potential for LSE.
						<ul style="list-style-type: none"> <li>Kittiwake</li> </ul>	<ul style="list-style-type: none"> <li>N/a</li> </ul>	<ul style="list-style-type: none"> <li>Collision risk due to the presence of turbines.</li> </ul>	<ul style="list-style-type: none"> <li>N/a</li> </ul>	
North Caithness Cliffs SPA	610.4	623.4	582.5	618.6	623.4	<ul style="list-style-type: none"> <li>Puffin;</li> <li>Guillemot; and</li> <li>Razorbill</li> </ul>	<ul style="list-style-type: none"> <li>Direct disturbance and displacement due to the presence of the array infrastructure, work activity and vessel movements in both the offshore and intertidal zones.</li> </ul>			Evidence to suggest connectivity and therefore effects cannot be screened out at this stage and therefore there is a potential for LSE.
						<ul style="list-style-type: none"> <li>Kittiwake</li> </ul>	<ul style="list-style-type: none"> <li>N/a</li> </ul>	<ul style="list-style-type: none"> <li>Collision risk due to the presence of turbines.</li> </ul>	<ul style="list-style-type: none"> <li>N/a</li> </ul>	
Copinsay SPA	630.9	646.2	608.8	641.2	646.6	<ul style="list-style-type: none"> <li>Guillemot</li> </ul>	<ul style="list-style-type: none"> <li>Direct disturbance and displacement due to the presence of the array infrastructure, work activity and vessel movements in both the offshore and intertidal zones.</li> </ul>			Evidence to suggest connectivity and therefore effects cannot be screened out at this

Designated Site	Distance to Array (km)	Distance to the Project ECC (km)	Distance to the ANS (km)	Distance to the biogenic reef (km)	Distance to the ORCP (km)	Feature(s) to Consider for Potential LSE	Potential Effects			Potential for LSE
							Construction	Operation and Maintenance	Decommissioning	
						<ul style="list-style-type: none"> <li>Kittiwake</li> </ul>	<ul style="list-style-type: none"> <li>N/a</li> </ul>	<ul style="list-style-type: none"> <li>Collision risk due to the presence of turbines.</li> </ul>	<ul style="list-style-type: none"> <li>N/a</li> </ul>	stage and therefore there is a potential for LSE.
Hoy SPA	634.8	647.5	607.0	642.8	647.5	<ul style="list-style-type: none"> <li>Puffin; and</li> <li>Guillemot.</li> </ul>	<ul style="list-style-type: none"> <li>Direct disturbance and displacement due to the presence of the array infrastructure, work activity and vessel movements in both the offshore and intertidal zones.</li> </ul>			Evidence to suggest connectivity and therefore effects cannot be screened out at this stage and therefore there is a potential for LSE.
Calf of Eday SPA	667.1	682.4	645.2	678.0	683.5	<ul style="list-style-type: none"> <li>Kittiwake</li> </ul>	<ul style="list-style-type: none"> <li>N/a</li> </ul>	<ul style="list-style-type: none"> <li>Collision risk due to the presence of turbines.</li> </ul>	<ul style="list-style-type: none"> <li>N/a</li> </ul>	Evidence to suggest connectivity and therefore effects cannot be screened out at this stage and therefore there is a potential for LSE.
						<ul style="list-style-type: none"> <li>Guillemot</li> </ul>	<ul style="list-style-type: none"> <li>Direct disturbance and displacement due to the presence of the array infrastructure, work activity and vessel movements in both the offshore and intertidal zones.</li> </ul>			
Rousay SPA	668.0	683.2	645.8	677.9	683.2	<ul style="list-style-type: none"> <li>Guillemot</li> </ul>	<ul style="list-style-type: none"> <li>Direct disturbance and displacement due to the presence of the array infrastructure, work activity and vessel movements in both the offshore and intertidal zones.</li> </ul>			Evidence to suggest connectivity and therefore effects cannot be screened out at this stage and therefore there is a potential for LSE.
Marwick Head SPA	670.4	683.9	642.6	679.0	683.9	<ul style="list-style-type: none"> <li>Guillemot;</li> <li>Puffin; and</li> <li>Gannet</li> </ul>	<ul style="list-style-type: none"> <li>Direct disturbance and displacement due to the presence of the array infrastructure, work activity and vessel movements in both the offshore and intertidal zones.</li> </ul>			Evidence to suggest connectivity and therefore effects cannot be screened out at this stage and therefore there is a potential for LSE.
						<ul style="list-style-type: none"> <li>Kittiwake; and</li> <li>Gannet</li> </ul>	<ul style="list-style-type: none"> <li>N/a</li> </ul>	<ul style="list-style-type: none"> <li>Collision risk due to the presence of turbines.</li> </ul>	<ul style="list-style-type: none"> <li>N/a</li> </ul>	
Fair Isle SPA	674.7	690.0	648.7	690.2	696.7	<ul style="list-style-type: none"> <li>Kittiwake</li> </ul>	<ul style="list-style-type: none"> <li>N/a</li> </ul>	<ul style="list-style-type: none"> <li>Collision risk due to the presence of turbines.</li> </ul>	<ul style="list-style-type: none"> <li>N/a</li> </ul>	Evidence to suggest connectivity and therefore effects cannot be screened out at this stage and therefore there is a potential for LSE.
						<ul style="list-style-type: none"> <li>Guillemot</li> </ul>	<ul style="list-style-type: none"> <li>Direct disturbance and displacement due to the presence of the array infrastructure, work activity and vessel movements in both the offshore and intertidal zones.</li> </ul>			

Designated Site	Distance to Array (km)	Distance to the Project ECC (km)	Distance to the ANS (km)	Distance to the biogenic reef (km)	Distance to the ORCP (km)	Feature(s) to Consider for Potential LSE	Potential Effects			Potential for LSE
							Construction	Operation and Maintenance	Decommissioning	
West Westray SPA	678.5	693.8	650.9	688.6	693.9	<ul style="list-style-type: none"> <li>Guillemot; and</li> <li>Razorbill.</li> </ul>	<ul style="list-style-type: none"> <li>Direct disturbance and displacement due to the presence of the array infrastructure, work activity and vessel movements in both the offshore and intertidal zones.</li> </ul>			Evidence to suggest connectivity and therefore effects cannot be screened out at this stage and therefore there is a potential for LSE.
						<ul style="list-style-type: none"> <li>Kittiwake</li> </ul>	<ul style="list-style-type: none"> <li>N/a</li> </ul>	<ul style="list-style-type: none"> <li>Collision risk due to the presence of turbines.</li> </ul>	<ul style="list-style-type: none"> <li>N/a</li> </ul>	
Sumburgh Head SPA	706.5	722.0	681.8	724.3	731.1	<ul style="list-style-type: none"> <li>Kittiwake</li> </ul>	<ul style="list-style-type: none"> <li>N/a</li> </ul>	<ul style="list-style-type: none"> <li>Collision risk due to the presence of turbines.</li> </ul>	<ul style="list-style-type: none"> <li>N/a</li> </ul>	Evidence to suggest connectivity and therefore effects cannot be screened out at this stage and therefore there is a potential for LSE.
						<ul style="list-style-type: none"> <li>Guillemot</li> </ul>	<ul style="list-style-type: none"> <li>Direct disturbance and displacement due to the presence of the array infrastructure, work activity and vessel movements in both the offshore and intertidal zones.</li> </ul>			
Noss SPA	733.3	749.0	709.5	752.7	759.8	<ul style="list-style-type: none"> <li>Guillemot; and</li> <li>Puffin.</li> </ul>	<ul style="list-style-type: none"> <li>Direct disturbance and displacement due to the presence of the array infrastructure, work activity and vessel movements in both the offshore and intertidal zones.</li> </ul>			Evidence to suggest connectivity and therefore effects cannot be screened out at this stage and therefore there is a potential for LSE.
						<ul style="list-style-type: none"> <li>Kittiwake</li> </ul>	<ul style="list-style-type: none"> <li>N/a</li> </ul>	<ul style="list-style-type: none"> <li>Collision risk due to the presence of turbines.</li> </ul>	<ul style="list-style-type: none"> <li>N/a</li> </ul>	
Foula SPA	746.7	761.5	726.1	761.2	767.6	<ul style="list-style-type: none"> <li>Guillemot;</li> <li>Razorbill; and</li> <li>Puffin.</li> </ul>	<ul style="list-style-type: none"> <li>Direct disturbance and displacement due to the presence of the array infrastructure, work activity and vessel movements in both the offshore and intertidal zones.</li> </ul>			Evidence to suggest connectivity and therefore effects cannot be screened out at this stage and therefore there is a potential for LSE.
						<ul style="list-style-type: none"> <li>Kittiwake</li> </ul>	<ul style="list-style-type: none"> <li>N/a</li> </ul>	<ul style="list-style-type: none"> <li>Collision risk due to the presence of turbines.</li> </ul>	<ul style="list-style-type: none"> <li>N/a</li> </ul>	
Hermaness, Saxa Vord and Valla Field SPA	798.8	814.6	775.7	819.3	826.5	<ul style="list-style-type: none"> <li>Guillemot;</li> <li>Puffin; and</li> <li>Gannet</li> </ul>	<ul style="list-style-type: none"> <li>Direct disturbance and displacement due to the presence of the array infrastructure, work activity and vessel movements in both the offshore and intertidal zones.</li> </ul>			Evidence to suggest connectivity and therefore effects cannot be screened out at this stage and therefore there is a potential for LSE.
						<ul style="list-style-type: none"> <li>Kittiwake; and</li> <li>Gannet</li> </ul>	<ul style="list-style-type: none"> <li>N/a</li> </ul>	<ul style="list-style-type: none"> <li>Collision risk due to the presence of turbines.</li> </ul>	<ul style="list-style-type: none"> <li>N/a</li> </ul>	

## 7.4 Migratory Fish

Table 7.4: Conclusion of LSE for Migratory Fish

Designated Site	Distance to Array (km)	Distance to the Project ECC (km)	Distance to the ANS (km)	Distance to the biogenic reef (km)	Distance to the ORCP (km)	Feature(s) to Consider for Potential LSE	Construction	Potential Effects Operation and Maintenance	Decommissioning	Potential for LSE Alone	Potential for LSE In-Combination
Humber Estuary SAC	54.4	18.5	47.5	23.8	19.7	<ul style="list-style-type: none"> <li>Sea lamprey <i>Petromyzon marinus</i>; and</li> <li>River lamprey <i>Lampetra fluviatilis</i>.</li> </ul>	<ul style="list-style-type: none"> <li>Underwater noise.</li> </ul>	<ul style="list-style-type: none"> <li>Underwater noise.</li> </ul>	<ul style="list-style-type: none"> <li>Underwater noise.</li> </ul>	The range between the Project and designated site mean that there is a potential for LSE for this species at this site.	The site is screened in alone and therefore it is also screened through in-combination.

## 7.5 Onshore Ecology and Ornithology

Table 7.5: Conclusion of LSE for Onshore Ecology

Designated Site	Distance to the Project ECC (km)	Feature(s) to Consider for Potential LSE	Construction	Effects Considered Operation and Maintenance	Decommissioning	Consideration of LSE Alone	Conclusion Alone	Consideration of LSE in-Combination
Humber Estuary SPA	12.5	<ul style="list-style-type: none"> <li>Great bittern <i>Botaurus stellaris</i> (Non-breeding and breeding)</li> <li>Common shelduck <i>Tadorna tadorna</i> (Non-breeding)</li> <li>Eurasian marsh harrier <i>Circus aeruginosus</i> (Breeding)</li> <li>Hen harrier <i>Circus cyaneus</i> (Non-breeding)</li> <li>Pied avocet <i>Recurvirostra avosetta</i> (Non-breeding and breeding)</li> <li>European golden plover <i>Pluvialis apricaria</i> (Non-breeding)</li> <li>Red knot <i>Calidris canutus</i> (Non-breeding)</li> <li>Dunlin <i>Calidris alpina alpina</i> (Non-breeding)</li> </ul>	<ul style="list-style-type: none"> <li>Loss of foraging, roosting and nesting habitat inside and outside the SPA for birds</li> <li>Disturbance/displacement of birds inside and outside the SPA</li> <li>Pollution from site run-off affecting habitat quality and resources</li> </ul>	<ul style="list-style-type: none"> <li>Disturbance/displacement of birds arising from vehicles and workers accessing onshore structures for maintenance</li> </ul>	<ul style="list-style-type: none"> <li>Disturbance/displacement of birds inside and outside SPA</li> <li>Pollution from site run-off affecting habitat quality</li> </ul>	<ul style="list-style-type: none"> <li>Risk of disturbance, and of loss of foraging, roosting and nesting habitat for birds outside the SPA.</li> </ul>	Potential for LSE on all qualifying features.	The site is screened in alone and therefore it is also screened through in-combination.



Designated Site	Distance to the Project ECC (km)	Feature(s) to Consider for Potential LSE	Effects Considered			Consideration of LSE Alone	Conclusion Alone	Consideration of LSE in-Combination
			Construction	Operation and Maintenance	Decommissioning			
		<ul style="list-style-type: none"> <li>▪ Ruff <i>Philomachus pugnax</i> (Non-breeding)</li> <li>▪ Black-tailed godwit <i>Limosa limosa islandica</i> (Non-breeding)</li> <li>▪ Bar-tailed godwit <i>Limosa lapponica</i> (Non-breeding)</li> <li>▪ Common redshank <i>Tringa totanus</i> (Non-breeding)</li> <li>▪ Little tern <i>Sterna albifrons</i> (Breeding); and</li> <li>▪ Waterbird assemblage</li> </ul>						
Humber Estuary Ramsar site	12.5	<p>Onshore Ramsar Features:</p> <ul style="list-style-type: none"> <li>▪ Criterion 1- dune systems and humid dune slacks</li> <li>▪ Criterion 5 – assemblages of international importance (waterfowl, non-breeding season);</li> <li>▪ Criterion 6 – species/populations occurring at levels of international importance:</li> </ul> <ul style="list-style-type: none"> <li>▪ common shelduck <i>Tadorna tadorna</i></li> <li>▪ Eurasian golden plover <i>Pluvialis apricaria</i></li> <li>▪ red knot <i>Calidris canutus islandica</i> subspecies</li> <li>▪ Dunlin <i>Calidris alpina</i></li> <li>▪ Black-tailed godwit <i>Limosa limosa islandica</i> subspecies</li> <li>▪ Bar-tailed godwit <i>Limosa lapponica lapponica</i> subspecies</li> <li>▪ Common redshank <i>Tringa tetanus brittanica</i> subspecies</li> </ul>	<ul style="list-style-type: none"> <li>▪ Loss of estuary habitats such as dune systems and dune slacks;</li> <li>▪ Loss of foraging, roosting and nesting habitat within the site and surrounding area</li> <li>▪ Disturbance of birds within and outside the site</li> <li>▪ Possible loss of estuary habitats</li> <li>▪ Pollution from site run-off affecting habitat quality and resources</li> </ul>	<ul style="list-style-type: none"> <li>▪ Damage to habitats and disturbance/displacement of birds arising from vehicles and workers accessing onshore structures for maintenance</li> </ul>	<ul style="list-style-type: none"> <li>▪ Disturbance/displacement of birds within and outside the site; and</li> <li>▪ Pollution from site run-off affecting habitat quality</li> </ul>	<ul style="list-style-type: none"> <li>▪ Risk of disturbance, and of loss of foraging and roosting habitat for birds outside the Ramsar site</li> </ul>	Potential for LSE on all ornithological qualifying features.	The site is screened in alone and therefore it is also screened through in-combination.

Designated Site	Distance to the Project ECC (km)	Feature(s) to Consider for Potential LSE	Effects Considered			Consideration of LSE Alone	Conclusion Alone	Consideration of LSE in-Combination
			Construction	Operation and Maintenance	Decommissioning			
Humber Estuary SAC	18.9	<ul style="list-style-type: none"> <li>▪ H1110. Sandbanks which are slightly covered by sea water all the time; Subtidal sandbanks</li> <li>▪ H1130. Estuaries</li> <li>▪ H1140. Mudflats and sandflats not covered by seawater at low tide; Intertidal mudflats and sandflats</li> <li>▪ H1150. Coastal lagoons</li> <li>▪ H1310. Salicornia and other annuals colonising mud and sand; Glasswort and other annuals colonising mud and sand</li> <li>▪ H1330. Atlantic salt meadows (<i>Glaucopuccinellietalia maritima</i>)</li> <li>▪ H2110. Embryonic shifting dunes H2120. Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes)</li> <li>▪ Shifting dunes with marram</li> <li>▪ H2130. Fixed dunes with herbaceous vegetation (grey dunes); Dune grassland*</li> <li>▪ H2160. Dunes with <i>Hippophae rhamnoides</i>; Dunes with sea-buckthorn</li> </ul>	<ul style="list-style-type: none"> <li>▪ Possible loss of or damage to Annex I estuary habitats</li> <li>▪ Pollution from site run-off affecting habitat quality</li> </ul>	<ul style="list-style-type: none"> <li>▪ Damage to habitats from operations and maintenance activities</li> </ul>	<ul style="list-style-type: none"> <li>▪ Pollution from site run-off affecting habitat quality</li> </ul>	<ul style="list-style-type: none"> <li>▪ Due to the distance between the ZOI and the SAC, and the nature of the habitats, there is no risk of undermining the conservation objectives for this SAC</li> </ul>	LSE can be excluded for the project alone	Possible pollution risk due to combining with pollution from other projects, and therefore potential for LSE in combination.
Saltfleetby-Theddlethorpe Dunes & Gibraltar Point SAC	11.9	Annex I habitats: <ul style="list-style-type: none"> <li>▪ 2110 Embryonic shifting dunes</li> <li>▪ 2120 Shifting dunes along the shoreline with</li> </ul>	<ul style="list-style-type: none"> <li>▪ Disturbance and loss of Annex I habitats present within the SAC</li> </ul>	<ul style="list-style-type: none"> <li>▪ Damage to habitats from operations and maintenance activities.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Disturbance and loss of Annex I habitats present within the SAC</li> </ul>	<ul style="list-style-type: none"> <li>▪ Pollution from site run-off.</li> </ul>	Potential for LSE on all qualifying features. This is a precautionary conclusion based on project design uncertainties.	The site is screened in alone and therefore it is also screened through in-combination.

Designated Site	Distance to the Project ECC (km)	Feature(s) to Consider for Potential LSE	Effects Considered			Consideration of LSE Alone	Conclusion Alone	Consideration of LSE in-Combination
			Construction	Operation and Maintenance	Decommissioning			
		<ul style="list-style-type: none"> <li><i>Ammophila arenaria</i> ("white dunes");</li> <li>2130 Fixed coastal dunes with herbaceous vegetation ("grey dunes") *</li> <li>2160 Dunes with <i>Hippophae rhamnoides</i></li> <li>2190 Humid dune slacks</li> </ul>	<ul style="list-style-type: none"> <li>Disturbance to species present within the SAC</li> <li>Reduction of habitat quality</li> <li>Pollution from site run-off.</li> </ul>		<ul style="list-style-type: none"> <li>Disturbance to species present within the SAC</li> <li>Reduction of habitat quality</li> <li>Pollution from site run-off</li> </ul>			
The Wash SPA	16.5	<ul style="list-style-type: none"> <li>Bewick's swan <i>Cygnus columbianus bewickii</i> (Non-breeding)</li> <li>Pink-footed goose <i>Anser brachyrhynchus</i> (Non-breeding)</li> <li>Dark-bellied brent goose <i>Branta bernicla bernicla</i> (Non-breeding)</li> <li>Common shelduck <i>Tadorna tadorna</i> (Non-breeding)</li> <li>Eurasian wigeon <i>Anas penelope</i> (Non-breeding)</li> <li>Gadwall <i>Anas strepera</i> (Non-breeding)</li> <li>Northern pintail <i>Anas acuta</i> (Non-breeding)</li> <li>Black (common) scoter <i>Melanitta nigra</i> (Non-breeding)</li> <li>Common goldeneye <i>Bucephala clangula</i> (Non-breeding)</li> <li>Eurasian oystercatcher <i>Haematopus ostralegus</i> (Non-breeding)</li> <li>Grey plover <i>Pluvialis squatarola</i> (Non-breeding)</li> <li>Red knot <i>Calidris canutus</i> (Non-breeding)</li> </ul>	<ul style="list-style-type: none"> <li>Loss of foraging, roosting, and nesting habitat within the site and surrounding area</li> <li>Disturbance of birds within and outside the SPA</li> <li>Pollution from site run-off affecting habitat quality</li> </ul>	<ul style="list-style-type: none"> <li>Disturbance/ displacement of birds arising from vehicles and workers accessing onshore structures for maintenance.</li> </ul>	<ul style="list-style-type: none"> <li>Disturbance/ displacement of birds outside SPA; and</li> <li>Pollution from site run-off affecting habitat quality.</li> </ul>	<ul style="list-style-type: none"> <li>Risk of disturbance inside and outside the SPA and loss of foraging roosting and nesting habitat for birds outside the SPA</li> <li>Risk of pollution</li> </ul>	Potential for LSE on all qualifying features.	The site is screened in alone and therefore it is also screened through in-combination.

Designated Site	Distance to the Project ECC (km)	Feature(s) to Consider for Potential LSE	Effects Considered			Consideration of LSE Alone	Conclusion Alone	Consideration of LSE in-Combination
			Construction	Operation and Maintenance	Decommissioning			
		<ul style="list-style-type: none"> <li>▪ Sanderling <i>Calidris alba</i> (Non-breeding)</li> <li>▪ Dunlin <i>Calidris alpina alpina</i> (Non-breeding)</li> <li>▪ Black-tailed godwit <i>Limosa limosa islandica</i> (Non-breeding)</li> <li>▪ Bar-tailed godwit <i>Limosa lapponica</i> (Non-breeding)</li> <li>▪ Eurasian curlew <i>Numenius arquata</i> (Non-breeding)</li> <li>▪ Common redshank <i>Tringa totanus</i> (Non-breeding)</li> <li>▪ Ruddy turnstone <i>Arenaria interpres</i> (Non-breeding)</li> <li>▪ Common tern <i>Sterna hirundo</i> (Breeding)</li> <li>▪ Little tern <i>Sterna albifrons</i> (Breeding)</li> <li>▪ Waterbird assemblage</li> </ul>						
The Wash Ramsar site	16.5	<ul style="list-style-type: none"> <li>▪ Criterion 1 – Saltmarshes, major intertidal banks of sand and mud, shallow water, and deep channels</li> <li>▪ Criterion 3 – inter-relationship between saltmarshes, intertidal sand, mudflats, and estuarine waters</li> <li>▪ Criterion 5 – Bird assemblages of international importance</li> <li>▪ Criterion 6 – Bird species/populations occurring at levels of international importance</li> </ul> <p>Species with peak counts in spring/autumn:</p> <ul style="list-style-type: none"> <li>▪ Common redshank <i>Tringa totanus totanus</i>;</li> </ul>	<ul style="list-style-type: none"> <li>▪ Possible loss of or damage to estuary habitats</li> <li>▪ Loss of foraging and roosting habitat within the site and surrounding area</li> <li>▪ Disturbance of birds within and outside the site</li> <li>▪ Pollution from site run-off affecting habitat quality</li> </ul>	<ul style="list-style-type: none"> <li>▪ Damage to habitats and disturbance/displacement of birds arising from vehicles and workers accessing onshore structures for maintenance.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Disturbance/displacement of birds outside the site</li> <li>▪ Pollution from site run-off affecting habitat quality</li> </ul>	<ul style="list-style-type: none"> <li>▪ Risk of disturbance inside and outside the Ramsar and loss of foraging, roosting and nesting habitat outside the Ramsar site</li> <li>▪ Risk of pollution</li> </ul>	Potential for LSE on all qualifying features.	The site is screened in alone and therefore it is also screened through in-combination.

Designated Site	Distance to the Project ECC (km)	Feature(s) to Consider for Potential LSE	Construction	Effects Considered Operation and Maintenance	Decommissioning	Consideration of LSE Alone	Conclusion Alone	Consideration of LSE in-Combination
		<ul style="list-style-type: none"> <li>▪ Eurasian curlew <i>Numenius arquata arquata</i> (breeding)</li> <li>▪ Eurasian oystercatcher <i>Haematopus ostralegus ostralegus</i> (wintering)</li> <li>▪ Grey plover <i>Pluvialis squatarola</i> (wintering)</li> <li>▪ Red knot <i>Calidris canutus islandica</i> (wintering)</li> <li>▪ Sanderling <i>Calidris alba</i></li> </ul> <p>Species with peak counts in winter:</p> <ul style="list-style-type: none"> <li>▪ Black-headed gull <i>Larus ridibundus</i></li> <li>▪ Common eider <i>Somateria mollissima mollissima</i></li> <li>▪ Bar-tailed godwit <i>Limosa lapponica lapponica</i></li> <li>▪ Common shelduck <i>Tadorna tadorna</i></li> <li>▪ Dark-bellied brent goose <i>Branta bernicla bernicla</i></li> <li>▪ Dunlin <i>Calidris alpina alpina</i></li> <li>▪ Pink-footed goose <i>Anser brachyrhynchus</i></li> <li>▪ European golden plover <i>Pluvialis apricaria altifrons</i></li> <li>▪ Northern lapwing <i>Vanellus vanellus</i></li> </ul> <p>Species with peak counts in spring/autumn:</p> <ul style="list-style-type: none"> <li>▪ Black-tailed godwit <i>Limosa limosa islandica</i></li> <li>▪ Ringed plover <i>Charadrius hiaticula</i></li> </ul>						

Designated Site	Distance to the Project ECC (km)	Feature(s) to Consider for Potential LSE	Effects Considered			Consideration of LSE Alone	Conclusion Alone	Consideration of LSE in-Combination
			Construction	Operation and Maintenance	Decommissioning			
The Wash & North Norfolk Coast SAC	13.4	<ul style="list-style-type: none"> <li>1330 Atlantic salt meadows (<i>Glaucopuccinellietalia maritima</i>)</li> <li>1420 Mediterranean and thermo-Atlantic halophilous scrubs (<i>Sarcocornetea fruticosi</i>)</li> <li>1150 Coastal lagoons *Priority feature</li> <li>Otter</li> </ul>	<ul style="list-style-type: none"> <li>Disturbance and loss of Annex I habitats present within the SAC</li> <li>Disturbance to species present within the SAC</li> <li>Displacement of otter and reduction of otter habitat</li> </ul>	<ul style="list-style-type: none"> <li>Damage to habitats from operations and maintenance activities.</li> </ul>	<ul style="list-style-type: none"> <li>Disturbance and loss of Annex I habitats present within the SAC</li> <li>Disturbance to species present within the SAC</li> <li>Reduction of habitat quality</li> <li>Displacement of otter.</li> </ul>	<ul style="list-style-type: none"> <li>Displacement of Otter and reduction of otter habitat.</li> </ul>	Potential for LSE on all qualifying features. This is a precautionary conclusion based on project design uncertainties	The site is screened in alone and therefore it is also screened through in-combination.
Greater Wash SPA	0.0	<p>Breeding bird species:</p> <ul style="list-style-type: none"> <li>Sandwich tern <i>Sterna sandvicensis</i></li> <li>Common tern <i>Sterna hirundo</i></li> <li>Little tern <i>Sternula albifrons</i></li> </ul>	<ul style="list-style-type: none"> <li>Loss of foraging and nesting habitat inside and outside the SPA for birds</li> <li>Possible impact on migratory bird species using the site</li> <li>Disturbance of birds within and outside the SPA</li> <li>Pollution from site run-off affecting habitat quality and foraging resources</li> </ul>	<ul style="list-style-type: none"> <li>Disturbance/displacement of birds arising from vehicles and workers accessing onshore structures for maintenance.</li> </ul>	<ul style="list-style-type: none"> <li>Disturbance/displacement of birds within and outside SPA; and</li> <li>Pollution from site run-off affecting habitat quality and foraging resources.</li> </ul>	<ul style="list-style-type: none"> <li>Risk of disturbance of foraging birds inside the SPA</li> <li>Risk of pollution</li> </ul>	Potential for LSE on all qualifying features.	The site is screened in alone and therefore it is also screened through in-combination.
Gibraltar Point SPA	13.4	<ul style="list-style-type: none"> <li>Grey plover <i>Pluvialis squatarola</i> (Non-breeding)</li> <li>Sanderling <i>Calidris alba</i> (Non-breeding)</li> <li>Bar-tailed godwit <i>Limosa lapponica</i> (Non-breeding)</li> <li>Little tern <i>Sterna albifrons</i> (Breeding)</li> </ul>	<ul style="list-style-type: none"> <li>Loss of foraging, roosting and nesting habitat within the site and surrounding area</li> <li>Disturbance of birds within and outside the SPA</li> <li>Pollution from site run-off affecting habitat quality</li> </ul>	<ul style="list-style-type: none"> <li>Disturbance/displacement of birds arising from vehicles and workers accessing onshore structures for maintenance.</li> </ul>	<ul style="list-style-type: none"> <li>Disturbance/displacement of birds outside SPA</li> <li>Pollution from site run-off affecting habitat quality</li> </ul>	<ul style="list-style-type: none"> <li>Risk of pollution</li> </ul>	Potential for LSE on all qualifying features.	The site is screened in alone and therefore it is also screened through in-combination.

Designated Site	Distance to the Project ECC (km)	Feature(s) to Consider for Potential LSE	Effects Considered			Consideration of LSE Alone	Conclusion Alone	Consideration of LSE in-Combination
			Construction	Operation and Maintenance	Decommissioning			
Gibraltar Point Ramsar site	13.4	<p>Onshore Ramsar Features:</p> <ul style="list-style-type: none"> <li>▪ Ramsar Criterion 1: Coastal habitats – estuarine mudflats, sandbanks, and saltmarsh</li> <li>▪ Ramsar Criterion 2: Red Data book invertebrates – including: <ul style="list-style-type: none"> <li>▪ <i>Athetis pallustris</i>, (marsh moth, terrestrial)</li> <li>▪ <i>Dexiopsis lacustris</i>, (a fly, terrestrial)</li> <li>▪ <i>Eupithecia extensaria</i> (scarce pug moth, terrestrial)</li> <li>▪ <i>Gymnacyla canella</i> (a moth, terrestrial)</li> <li>▪ <i>Haematapota bigoti</i> (a horsefly, terrestrial)</li> <li>▪ <i>Haliphus mucronatus</i> (a water beetle, aquatic)</li> <li>▪ <i>Phaonia fusca</i> (a fly, terrestrial)</li> <li>▪ <i>Pherbellia dorsata</i> (a snail killing fly, terrestrial)</li> <li>▪ <i>Rymosia connexa</i> (a fly, terrestrial)</li> <li>▪ <i>Salticella fasciata</i> (a snail killing fly, sand dunes)</li> <li>▪ <i>Spilogona biseriata</i> (a fly, terrestrial) and</li> <li>▪ <i>Brachytron pratense</i> (hairy dragonfly, aquatic)</li> </ul> </li> </ul> <p>Notable plant species, including:</p> <ul style="list-style-type: none"> <li>▪ <i>Althaea officinalis</i> (Marshmallow, emergent)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Loss of or damage to estuary habitats</li> <li>▪ Loss of foraging and roosting habitat for birds within the site and surrounding area</li> <li>▪ Disturbance of birds within and outside the site</li> <li>▪ Pollution from site run-off affecting habitat quality</li> <li>▪ Loss of or decline in populations of scarce invertebrates and plants</li> </ul>	<ul style="list-style-type: none"> <li>▪ Damage to habitats and disturbance/ displacement of birds arising from vehicles and workers accessing onshore structures for maintenance.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Loss of or damage to estuary habitats</li> <li>▪ Disturbance/ displacement of birds within and outside the site</li> <li>▪ Pollution from site run-off affecting habitat quality</li> </ul>	<ul style="list-style-type: none"> <li>▪ Risk of disturbance, and of loss of foraging and roosting habitat for dark-bellied brent goose outside the Ramsar site</li> <li>▪ Risk of pollution</li> </ul>	Potential for LSE on some coastal habitats, invertebrates, plants and birds within the Ramsar site and dark-bellied brent goose outside of the Ramsar site.	The site is screened in alone and therefore it is also screened through in-combination.

Designated Site	Distance to the Project ECC (km)	Feature(s) to Consider for Potential LSE	Effects Considered			Consideration of LSE Alone	Conclusion Alone	Consideration of LSE in-Combination
			Construction	Operation and Maintenance	Decommissioning			
		<ul style="list-style-type: none"> <li>▪ <i>Calystegia soldanella</i> (Sea bindweed, sand dunes)</li> <li>▪ <i>Eryngium maritimus</i> (Sea holly, sand dunes)</li> <li>▪ <i>Festuca arenaria</i> (Rush-leaved fescue, sand dunes)</li> <li>▪ <i>Frankenia laevis</i> (Sea heath, salt marsh)</li> <li>▪ <i>Parapholis incurve</i> (Curved hard-grass, salt marsh, shingle)</li> <li>▪ <i>Ranunculus baudotii</i> (Brackish water crowfoot, ditches etc)</li> <li>▪ <i>Salicornia pusilla</i> (Salicornia, saltmarsh)</li> <li>▪ <i>Sarcocornia perennis</i> (Perennial glasswort, saltmarsh)</li> <li>▪ <i>Silene maritima</i> (Sea campion, shingle)</li> <li>▪ <i>Suaeda vera</i> (Shrubby sea-blite, shingle).</li>   <li>▪ Ramsar Criterion 5: Waterfowl.</li> <li>▪ Ramsar Criterion 6: Grey plover, sanderling, bar-tailed godwit, dark-bellied brent goose.</li> </ul>						
North Norfolk SPA	29.9	<ul style="list-style-type: none"> <li>▪ Pink-footed goose</li> </ul>	<ul style="list-style-type: none"> <li>▪ Loss of foraging and roosting habitat for birds outside the SPA</li> <li>▪ Disturbance of birds outside the site</li> </ul>	<ul style="list-style-type: none"> <li>▪ Disturbance/displacement of birds arising from vehicles and workers accessing onshore structures for maintenance</li> </ul>	<ul style="list-style-type: none"> <li>▪ Disturbance/displacement of birds outside the SPA.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Risk of disturbance and loss of foraging and roosting habitat outside the SPA.</li> </ul>	Potential for LSE on pink-footed goose.	The site is screened in alone and therefore it is also screened through in-combination.
North Norfolk Ramsar	29.9	<ul style="list-style-type: none"> <li>▪ Pink-footed goose</li> </ul>	<ul style="list-style-type: none"> <li>▪ Loss of foraging and roosting habitat for birds</li> </ul>	<ul style="list-style-type: none"> <li>▪ Disturbance/displacement of birds arising from</li> </ul>	<ul style="list-style-type: none"> <li>▪ Disturbance/displacement of</li> </ul>	<ul style="list-style-type: none"> <li>▪ Risk of disturbance and loss of foraging</li> </ul>	Potential for LSE on pink-footed goose.	The site is screened in alone and therefore it is also



Designated Site	Distance to the Project ECC (km)	Feature(s) to Consider for Potential LSE	Construction	Effects Considered Operation and Maintenance	Decommissioning	Consideration of LSE Alone	Conclusion Alone	Consideration of LSE in-Combination
			outside the Ramsar site <ul style="list-style-type: none"> <li>▪ Disturbance of birds outside the site.</li> </ul>	vehicles and workers accessing onshore structures for maintenance.	birds outside the Ramsar.	and roosting habitat outside the Ramsar.		screened through in-combination.

## 8 References

- AMEC. (2002), Lynn and Inner Dowsing Offshore Wind Farms Pre-construction characterisation survey report.
- Bradbury, G., Trinder, M., Furness, B., Banks, A.N., Caldow, R.W. and Hume, D. (2014), 'Mapping seabird sensitivity to offshore wind farms', *PloS one*, 9/9: 1-17.
- Carter, M., Boehme, L., Duck, C., Grecian, W., Hastie, G., McConnell, B., Miller, D., Morris, C., Moss, S., Thompson, D., Thompson, P., and Russell, D. (2020), 'Habitat-based predictions of at-sea distribution for grey and harbour seals in the British Isles', Sea Mammal Research Unit, University of St Andrews, Report to BEIS, OESEA-16-76/OESEA-17-78. Available at <https://www.frontiersin.org/articles/10.3389/fmars.2022.875869/full> [Accessed: November 2023]
- Cooper, K., and Barry, J. (2017), RSMP Baseline Dataset. Cefas, UK. V1.
- DECC. (2011), 'UK Offshore Energy Strategic Environmental Assessment (OESEA) 2'. [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/195387/OESEA2\\_NTS.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/195387/OESEA2_NTS.pdf) [Accessed: March 2022].
- Defra. (2021a), 'Changes to the Habitats Regulations 2017'. <https://www.gov.uk/government/publications/changes-to-the-habitats-regulations-2017/changes-to-the-habitats-regulations-2017> [Accessed: November 2021].
- Defra. (2021b). Magic Map Application Viewer. Available online: <https://magic.defra.gov.uk/MagicMap.aspx>. [Accessed: November 2021].
- Dierschke, V., Furness, R.W. and Garthe, S. (2016), 'Seabirds and offshore wind farms in European waters: Avoidance and attraction', *Biological Conservation*, 202: 59-68.
- Dietz, R., Teilmann, J., Henriksen, O.D., and Laidre, K. (2003), 'Movements of seals from Rødsand sanctuary monitored by satellite telemetry. Relative importance of the Nysted Offshore Wind Farm are to seals', National Environmental Research Institute, Denmark, Report No. 429: 44.
- EGS International (2010), 'Lynn and Inner Dowsing Geophysical and Biological Survey report'. <https://www.marinedataexchange.co.uk/details/1031> [Accessed: January 2022].
- EGS International. (2011), Year 1 Lynn and Inner Dowsing wind farms post-construction monitoring survey report.
- EGS International. (2015), Lincs Offshore Wind Farm, Post Construction Hydrographic, Geophysical and Benthic Survey.
- EMODnet. (2021), Licensed under CC-BY 4.0 from the European Marine Observation and Data Network (EMODnet) Seabed Habitats initiative ([www.emodnet-seabedhabitats.eu](http://www.emodnet-seabedhabitats.eu)), funded by the European Commission.
- EMU Ltd. (2005), Lincs OWFBenthic Baseline Survey Report.

Envision. (2004), 'Sabellaria spinulosa mapping surveys. Produced for the Lynn and Inner Dowsing Offshore Wind Farm'. <https://www.marinedataexchange.co.uk/details/726/2004-envision-mapping-ltd-lynn-lincs-and-inner-dowsing-offshore-windfarms-sabellaria-spinulosa-survey/summary> [Accessed: January 2022].

ERM Ltd. (2012), 'Marine Aggregate Regional Environmental Assessment of the Humber and Outer Wash Region, Volumes 1 & 2', Humber Aggregate Dredging Association, Vol.1: 345 Vol.2: 231.

Equinor. (2021), 'Dudgeon and Sheringham Shoal Offshore Wind Farm Extensions Preliminary Environmental Impact Report'. Available at: <https://commonplace-customer-files.s3-eu-west-1.amazonaws.com/sepanddep/Chapter+12+Marine+Mammal+Ecology.pdf>

Fliessbach, K.L., Borkenhagen, K., Guse, N., Markones, N., Schwemmer, P. and Garthe, S. (2019), 'A ship traffic disturbance vulnerability index for Northwest European seabirds as a tool for marine spatial planning', *Frontiers in Marine Science*, 6/192: 1-15.

Fugro. (2020a), Dudgeon Extension Project Benthic Characterisation Report.

Fugro. (2020b), Sheringham Shoal Extension Project Benthic Characterisation Report.

Hammond, P. S., Lacey, C., Gilles, A., Viquerat, S., Börjesson, P., Herr, H., Macleod, K., Ridoux, V., Santos, M. B., Scheidat, M., Teilmann, J., Vingada, J. and Øien, N. (2021). 'Estimates of cetacean abundance in European Atlantic waters in summer 2016 from the SCANS-III aerial and shipboard survey'.

Heinänen, S. and Skov, H. (2015). The identification of discrete and persistent areas of relatively high harbour porpoise density in the wider UK marine area. JNCC Report No: 544.

HM Government (2008) Planning Act 2008. Available at: <https://www.legislation.gov.uk/ukpga/2008/29/contents> [Accessed: January 2022]

IAMMWG. (2023). 'Review of Management Unit boundaries for cetaceans in UK waters (2023)', JNCC Report 734, JNCC, Peterborough, ISSN 0963-8091.

The Institute of Estuarine and Coastal Studies (IECS). (2005). 2004-2005, Institute of Estuarine and Coastal Studies, Humber Gateway, Baseline Study of the Marine Ecology. Available at: <https://www.marinedataexchange.co.uk/details/685/packages>

JNCC. (2021). JNCC website homepage. Available online: <https://jncc.gov.uk/>. [Accessed: November 2021].

JNCC. (2022). Joint SNCB Interim Displacement Advice Note.

Lacey, C., Gilles, A., Börjesson, P., Herr, H., Macleod, K., Ridoux, V., Santos, M.B., Scheidat, M., Teilmann, J., Sveegaard, S., Vingada, J., Viquerat, S., Øien, N., & Hammond, P.S. (2022). Modelled density surfaces of cetaceans in European Atlantic waters in summer 2016 from the SCANS-III aerial and shipboard surveys. Available online - <https://scans3.wp.st-andrews.ac.uk/resources/> - [Accessed: November 2023]

Masden, E.A., Haydon, D.T., Fox, A.D., Furness, R.W., Bullman, R., and Desholm, M. (2009), 'Barriers to movement: impacts of wind farms on migrating birds', ICES Journal of Marine Science, 66/4: 746-753.

Natural England. (2021). Designated Sites Viewer. Available online: <https://designatedsites.naturalengland.org.uk/>. [Accessed: November 2021].

Natural England (2023). Natural England's Impact Risk Zones for Sites of Special Scientific Interest. [ssi irz user guidance magic.pdf \(defra.gov.uk\)](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/118214/ssi_irz_user_guidance_magic.pdf) (Accessed: March 2024)

OGUK. (undated). The Offshore Oil and Gas UK Database of Offshore Environmental Surveys. <http://oeuk.org.uk/product/ukbenthos-database-5-14/> [Accessed: March 2022].

OneBenthic database (2020), <https://openscience.cefas.co.uk/OneBenthicExtraction/> [Accessed: December 2022].

Orsted. (2018), Hornsea Project Three Offshore Wind Farm: Environmental Statement - Volume 5, Annex 2.1 - Benthic Ecology Technical Report. Document Reference: A6.5.2.1, 1-100.

Orsted. (2020), Hornsea Project One Offshore Wind Farm – Year 2 Post Construction Controlled Flow Excavation Monitoring Report.

Orsted. (2020), Hornsea Project One Offshore Wind Farm – Year 2 Post Construction Controlled Flow Excavation Monitoring Report.

Outer Dowsing Offshore Wind (2022) Outer Dowsing Offshore Windfarm Environmental Impact Assessment Scoping Report.

Paxton, C., Scott-Hayward, L., Mackenzie, M., Rexstad, E. and Thomas, L. (2016). 'Revised Phase III Data Analysis of Joint Cetacean Protocol Data Resources', JNCC, Peterborough 2016.

Precision Marine Survey Limited (PMSL). (2011). Humber Gateway Offshore Wind Farm, Benthic Monitoring Programme. Available at: <https://www.marinedataexchange.co.uk/details/699/packages>.

Precision Marine Survey Limited (PMSL). (2012). Humber Gateway Offshore Wind Farm, Benthic Monitoring Programme. Available at: <https://www.marinedataexchange.co.uk/details/699/packages>.

Precision Marine Survey Limited (PMSL). (2013). Humber Gateway Offshore Wind Farm, Benthic Monitoring Programme. Available at: <https://www.marinedataexchange.co.uk/details/699/packages>.

Precision Marine Survey Ltd. (2021), Triton Knoll Offshore Wind Farm Project Post Cable Installation Monitoring Survey 2021: Environmental Report. Revision 03. 2505-PMS-OCS-V-RA-4079506

Reid, J.B., Evans, P.G.H., and Northridge, S.P. (2003), 'Atlas of Cetacean Distribution in North-west European waters' in James B Reid, Peter G H Evans and Simon P Northridge (eds.), JNCC, Peterborough.

RPS. (2014), Year 3 Lynn and Inner Dowsing wind farms post-construction monitoring survey report.

SCANS-II, 2006. Small cetaceans in the European Atlantic and North Sea (SCANS-II), St Andrews: University of St Andrews. Available at: [http://biology.st-andrews.ac.uk/scans2/documents/final/SCANS-II\\_final\\_report.pdf](http://biology.st-andrews.ac.uk/scans2/documents/final/SCANS-II_final_report.pdf).

SCOS. (2009), 'Scientific advice on matters related to the management of seal populations: 2009' <http://www.smru.st-andrews.ac.uk/files/2016/08/SCOS-2009.pdf> [Accessed: October 2021].

SCOS. (2020), 'Scientific advice on matters related to the management of seal populations: 2020.' <http://www.smru.st-andrews.ac.uk/files/2021/06/SCOS-2020.pdf> [Accessed: October 2021].

Scott Wilson, Levett-Therivel Sustainability Consultants, Treweek Environmental Consultants and Land Use Consultants (2006). Appropriate Assessment of Plans.

Sea Mammal Research Unit (SMRU). (2006), 'Small Cetaceans in the European Atlantic and North Sea (SCANS-II)', University of St Andrews, UK. <http://biology.st-andrews.ac.uk/scans2/> [Accessed: October 2021].

SNCB. (2017), 'Joint SNCB Interim Displacement Advice Note. Advice on how to present assessment information on the extent and potential consequences of seabird displacement from Offshore Wind Farm (OWF) developments', JNCC. <https://hub.jncc.gov.uk/assets/9aecb87c-80c5-4cfb-9102-39f0228dcc9a> [Accessed: October 2021].

Speakman, J., Gray, H., and Furness. L. (2009), 'Effects of offshore wind farms on the energy demands on seabirds', University of Aberdeen Report to DECC. URN 09D/800.

Stone, C.J., Webb, A., and Tasker, M.L. (1995), 'The distribution of auks and Procellariiformes in north-west European waters in relation to depth of sea', *Bird Study*, 42/1: 50-56.

Tappin, D.R., Pearce, B., Fritch, S., Dove, D., Geary, B., Hill, J.M., Chambers, C., Bates. R., Pinnion, J., Diaz Doce, D., Green, M., Gallyot, J., Georgiou, L., Brutto, D., Marzialetti, S., Hopla, E., Ramsay, E., Fielding, H. (2011), 'The Humber Regional Environmental Characterisation'. British Geological Survey Open Report OR/10/54. MALSF: Crown copyright. 357pp.

The Court. (2018). *People Over Wind, Peter Sweetman v Coillte Teoranta (C-323/17)*, Reference for a preliminary ruling — Environment — Directive 92/43/EEC — Conservation of natural habitats — Special areas of conservation — Article 6(3) — Screening in order to determine whether or not it is necessary to carry out an assessment of the implications, for a special area of conservation, of a plan or project — Measures that may be taken into account for that purpose. <https://curia.europa.eu/juris/document/document.jsf?docid=200970&doclang=EN> [Accessed March 2022].

The Crown Estate. (2022). NIRAS Consulting - Plan Level HRA.

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

Triton Knoll OWF Limited (2019). Knoll OWF pre-Construction Benthic and Geophysical Baseline Report.

Vincent, C., Huon, M., Caurant, F., Dabin, W., Deniau, A., Dixneuf, S., Dupuis, L., Elder, J-F., Fremau, M-H, Hassani, S., Hemon, A., Karpouzopoulos, J., Lefeuvre, C., McConnell, B.J., Moss, S.E.W., Provost, P., Spitz, J., Turpin, Y., and Ridoux, V. (2017), 'Grey and harbour seals in France: Distribution at sea, connectivity and trends in abundance at haulout sites', Deep-Sea Research Part II, 141: 294-305.

Westermost Rough Ltd (2014), Westermost Rough pre-construction environmental monitoring survey reports.

Woodward, I., Thaxter, C. B., Owen, E., Cook, A. S. C. P. (2019), 'Desk-based revision of seabird foraging ranges used for HRA screening', BTO Research Report No. 724. ISBN 978-1-912642-12-0

Wright, L. J., Ross-Smith, V. H., Austin, G. E., Massimino, D., Dadam, D., Cook, A. S. C. P., Calbrade, N. A. and Burton, N. H. K. (2012), 'Assessing the risk of offshore wind farm development to migratory birds designated as features of UK Special Protection Areas (and other Annex 1 species)', Strategic Ornithological Support Services, Project SOSS-05, BTO Research Report No. 592

Wildfowl and Wetlands Trust (WWT) Consulting Ltd. (2014). Strategic assessment of Scottish offshore wind farms to migrating birds. Scottish Marine and Freshwater Science.