Habitats Regulations Appraisal Screening Report

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Glossary

Term	Definition
2023 Scoping Report[12]	EIA Scoping Report submitted 24 February 2023, superseded by the 2024 Scoping Report.
2024 Scoping Report[13]	EIA Scoping Report submitted on 23 April 2024. Superseding the 2023 Scoping Report.
2023 Scoping Opinion	Scoping Opinion received on 28 June 2023, will be superseded by the 2024 Scoping Opinion.
2024 Scoping Opinion	This Scoping Opinion is yet to be received.
Agreement for Lease	A legal agreement from The Crown Estate whereby an area of foreshore or seabed is occupied by a third party (a ''tenant'') for an agreed purpose, such as renewable energy, and which gives consent for the tenant to develop on the lease site(s), if other required permissions are gained.
Annex I (of the Habitats Directive)	Part of the Habitats Directive 92/43/EEC that identifies habitat types that require conservation through the designation of Special Areas of Conservation (SACs).
Annex II (of the Habitats Directive)	Part of the Habitats Directive 92/43/EEC that identifies species that require conservation through the designation of SACs.
Applicant	Term to describe Cenos Offshore Windfarm Ltd
Appropriate Assessment	An assessment to determine the implications of a plan or project on relevant national site network (NSN) sites in view of that site's conservation objectives. An Appropriate Assessment forms part of the Habitats Regulations Appraisal (HRA) and is required when a plan or project (either alone or in-combination with other plans or projects) is likely to have a significant effect on a NSN. Where there are adverse impacts, it also includes an assessment of the potential mitigation for those impacts.
Areas of Search	Areas of Search identified in the Sectoral Marine Plan for Offshore Wind for Innovation and Targeted Oil and Gas Decarbonisation (INTOG) Planning Specification and Context Report[14] providing the starting point from which optimum locations for offshore wind energy production can be identified.
Array Area	Term to describe the area within which the wind turbine generators, floating substructures, moorings and anchors, offshore substation and converter platforms, and inter-array cables will be present.
Barrier effect	Barrier effect is experienced by bird species which intend to forage beyond or migrate past the array but due to avoidance behaviour, have to navigate around the array. Barrier effect is often not discernible from displacement behaviour.
Baseline	Conditions, typically current conditions but can be future conditions, as represented by the latest available data, whether from literature or survey, and used as a benchmark for making comparisons to assess the impact of a development or project.
Baseline conditions	The environment as it appears (or would appear) immediately prior to the implementation of a project, together with any known or foreseeable future changes.

Term	Definition
Benthic Ecology	The study of the organisms living in and on the sea floor, the interactions between them and their impacts on the surrounding environment.
Biotope	A region of habitat associated with a particular ecological community.
Birds Directive[22]	Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the Conservation of Wild Birds.
Cetacean	Aquatic mostly marine mammals that includes the whales, dolphins, porpoises.
Cenos Offshore Windfarm	The name of the project.
Cenos Offshore Windfarm Ltd	The Applicant, a joint venture between Flotation Energy and Vårgrønn As (Vårgrønn).
Cetacean	Whales, dolphins and porpoises
Collision	Contact between moving objects.
Collision Risk Model	A tool for predicting risk of collision with a wind turbine or its blades.
Compensation	Loss of value is remedied or offset by a corresponding compensatory action on the same site or elsewhere, determined through the process of Environmental Impact Assessment.
Competent Authority	The term derives from the Habitats Regulations and relates to the exercise of the functions and duties under those Regulations. Competent authorities are defined in the Habitat Regulations as including "*any Minister, government department, statutory undertaker, public body of any description or person holding a public office*". In the context of a plan or project, the competent authority is the authority with the power or duty to determine whether or not the proposal can proceed.
Conservation Objective	Conservation objectives are directly linked to the integrity of a European site and has been defined in guidance as *"the coherent sum of the site's ecological structure, function and ecological processes, across its whole area, which enables it to sustain the habitats, complex of habitats and/or populations of species for which the site is designated"* [26]. An adverse effect on integrity, therefore, is likely to be one which prevents the site from making the same contribution to favourable conservation status for the relevant feature as it did at the time of designation. Conservation objectives are in place to protect the qualifying features of the site and to help assess the potential impacts of plans and projects.
Cumulative effects	The effect of the Project taken together with similar effects from a number of different projects, on the same single receptor/resource. Cumulative impacts are those that result from changes caused by other past, present or reasonably foreseeable actions together with the Project.
Decarbonisation	Refers to the process of reducing, and ultimately eliminating, the amount of greenhouse gases (mainly CO_2) emitted in the atmosphere. It is the core purpose of the Project, switching from the use of fossil fuels to carbon-free and renewables in the energy

Term	Definition
	sector. Decarbonisation is a commitment made by states and companies worldwide at the Paris Climate Agreement in 2015.
Decommissioning	The period during which a development and its associated processes are removed from active operation.
Demersal Fish	Demersal fish, also known as groundfish, live and feed on or near the bottom of seas.
Demersal species	Species that occupy the lower level of the water column, near the sea floor.
Demersal Trawl	A fishing net used by towing the trawl along or close to the seabed.
Diadromous species	Species that migrate between freshwater and marine environments to compete their lifecycle.
Digital Aerial Surveys (DAS)	Digital surveys carried out by aeroplane.
Direct effects	Those effects to receptor that result directly from the Project. An example would habitat loss as a result of clearance activities during construction.
Ecotype	A distinct form or race of a plant or animal species occupying a particular habitat.
Effect	The changes resulting from an action.
EIA Regulations	Terminology used in this HRA Screening Report refer to three sets of regulations: • The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017[10]; • The Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017[1]; • The Marine Works (Environmental Impact Assessment) Regulations 2007[11].
EIA Regulations 2017	The EIA Regulations require that the effects of a project, where these are likely to have a significant effect on the environment, are taken into account in the decision-making process for the project.
Electromagnetic field (EMF)	An electric and magnetic force field that surrounds a moving electric charge.
Embedded mitigation	Mitigation measures that are an inherent part of the Project design (primary mitigation) or implemented in accordance with industry standard practice that would occur with or without the input from the environmental assessment feeding into the process (tertiary mitigation)
European Commission (EC)	The European Union's (EU's) politically independent executive division. It is responsible for preparing proposals for new European legislation, and it implements the decisions of the European Parliament and the Council of the EU.
EUNIS habitat classification	A pan-European system which facilitates the harmonised description and classification of all types of habitat, through the use of criteria for habitat identification
European Protected Species (EPS)	Species of plants and animals (other than birds) listed in Annex IV (a) of the Habitats Directive that are protected by law.
European site	European sites are those that are designated through the Habitats Directive[22] and Birds Directive[21] (via national legislation as

Term	Definition
	appropriate). Within Scotland additional sites designated through international convention are given the same protection through policy - overall all of these are referred to as European sites. European sites in Scotland are considered to be SPAs, SACs, candidate SACs and Sites of Community Importance (SCI). Potential SPAs (pSPA), possible SACs (pSACs), Ramsar sites (designated under international convention) and proposed Ramsar sites
Exclusive Economic Zone (EEZ)	An exclusive economic zone is an area of the ocean, generally extending 200 nautical miles (230 miles) beyond a nation's territorial sea, within which a coastal nation has jurisdiction over both living and non-living resources.
Export/import Cable	The export/import cable will carry power from the HVDC component of the Offshore Substation Converter Platform (OSCP) landward to MHWS.
Export/import Cable Corridor (ECC)	Term to describe the area within which the export/import cable will be laid, from the perimeter of the Array Area to Mean High Water Springs (MHWS).
Feature	Ecological feature is the term used to refer to biodiversity/ecological receptors. This term is taken directly from Ecological Impact Assessment guidance from the Chartered Institute of Ecology and Environmental Management[2].
Fishing ground	An area of water or seabed targeted by fishing activity.
Floating Turbine Unit (FTU)	Term to describe the equipment associated with electricity generation comprising the Wind Turbine Generator (WTG), the floating substructure which supports the WTG, the mooring legs which maintain the position of the substructure and the dynamic section of the Inter-Array Cable.
Flotation Energy	Joint venture partner in the Applicant, to develop Cenos Offshore Windfarm (the Project).
Generation assets	Include the Floating Turbine Units (FTUs) (inclusive of substructure, wind turbine generators (WTGs), moorings systems), and dynamic and static portions of the inter-array cables.
Habitats Regulations	The Habitats Directive[21] (Directive 92/43/ECC) and the Wild Birds Directive[22] (Directive 2009/147/EC) were transposed into Scottish Law by the Conservation (Natural Habitats &c) Regulations 1994[18] (‘Habitats Regulations’) (up to 12 NM); by the Conservation of Offshore Marine Habitats and Species Regulations 2017[19] (‘Offshore Marine Regulations’) (beyond 12 NM); the Conservation of Habitats and Species Regulations 2017[20] (of relevance to consents under Section 36 of the Electricity Act 1989[8]); the Offshore Petroleum Activities (Conservation of Habitats) Regulations 2001[3]; and the Wildlife and Countryside Act 1981[4]. The Habitats Regulations set out the stages of the Habitats Regulations Appraisal (HRA) process required to assess the potential impacts of a proposed project on European Sites (Special Areas of Conservation, Special Protection Areas, candidate SACs and SPAs and Ramsar Sites).
Habitats Regulations Appraisal	The assessment of the impacts of implementing a plan or policy on a European Site, the purpose being to consider the impacts of a

Term	Definition
	project against conservation objectives of the site and to ascertain whether it would adversely affect the integrity of the site.
Horizontal Directional Drilling	An engineering technique for laying cables that avoids open trenches by drilling between two locations beneath the ground's surface.
Impact	An impact is a quantifiable change to the environment attributable to the construction and/or operation of a scheme compared with baseline condition
Impact pathway	A change descriptively assessed by one topic, and describes a pathway between an impact and a receptor.
In-combination effects	Effects resulting from the combined impacts of the Project with other projects/plans on European Sites within the NSN.
Indirect effects and secondary effects	Those effects that are not caused directly by the Project but arise as a consequence of it.
Infauna	Animals living in the sediment
Innovation and Targeted Oil and Gas (INTOG)	In November 2022, the Crown Estate Scotland (CES) announced the Innovation and Targeted Oil and Gas (INTOG) Leasing Round, to help enable this sector-wide commitment to decarbonisation. INTOG allows developers to apply for the rights to construct offshore windfarms for the purpose of providing low carbon electricity to power oil and gas installations and help to decarbonise the sector. Cenos is an INTOG project and part of the INTOG leasing round. This project is not part of the ScotWind process.
Inter-array cable	The cables which connect the Wind Turbine Generators (WTG) to the Offshore Substation and Converter Platform (OSCP). WTGs may be connected in a series along a single inter-array cable as a 'string' such that these WTGs connect to the OSCP via a single cable.
Inshore	The sea up to twelve nautical miles (12 NM) from the coast.
Intertidal	The area of the shoreline which is covered at high tide and uncovered at low tide.
Joint Venture (JV)	Term used to describe the commercial partnership between Flotation Energy and Vårgrønn, the shareholders which hold the Lease Exclusivity Agreement with Crown Estate Scotland to develop the Cenos site as an INTOG project.
Landfall	Term to describe the point where the cables within ECC are brought ashore at MHWS to connect the offshore and onshore infrastructure.
Likely Significant Effects	Any effect that may reasonably be predicted as a consequence of a plan or project that may affect the conservation objectives of the features for which the European site was designated but excluding trivial or inconsequential effects. A likely effect is one that cannot be ruled out on the basis of objective information. A 'significant' effect is a test of whether a plan or project could undermine the site's conservation objectives[5].
Marine Directorate	Civil service directorate for Scotland, which is responsible for the integrated management of Scotland's seas.
Marine Directorate Licensing Operations Team (MD-LOT)	The regulator for determining marine licence applications on behalf of the Scottish Ministers in the Scottish inshore region (between 0 and 12 nautical miles) under the Marine (Scotland) Act 2010, and in

Term	Definition
	the Scottish offshore region (between 12 and 200 nautical miles) under the Marine and Coastal Access Act 2009.
Marine licence	Licence required for certain activities in the marine environment and granted under either the Marine and Coastal Access Act 2009 or the Marine (Scotland) Act 2010.
Marine Protected Area (MPA)	Marine sites at the national level under the Marine (Scotland) Act 2010. In Scotland, MPAs are areas of sea defined so as to protect habitats, wildlife, geology, undersea landforms, historic shipwrecks and to demonstrate sustainable management of the sea.
Mean High-Water Springs (MHWS)	The height of Mean High Water Springs is the average throughout the year, of two successive high waters, during a 24-hour period in each month when the range of the tide is at its greatest.
Mean Low-Water Springs (MLWS)	The height of Mean Low Water Springs (MLWS) is the average throughout the year, of two successive low waters, during a 24-hour period in each month when the range of the tide is at its greatest
Megafauna	Large animals; conventionally animals of a mass comparable to or greater than humans (for instance over 100 lb/46 kg in weight)
Megawatts (MW)	Unit of electrical power equal to one million Watts.
Mitigation	Mitigation measures are embedded within the assessment at the relevant point in the EIA (e.g. at Scoping).
Nature Conservation Marine Protected Area (NCMPA)	MPA designated by Scottish Ministers in the interests of nature conservation under the Marine (Scotland) Act 2010[9]
NatureScot	Formerly known as Scottish Natural Heritage, NatureScot is a public body and government advisor responsible for Scotland's natural heritage, in particular for its natural, genetic and scenic diversity.
NorthConnect	Term to describe the proposed NorthConnect interconnector project with a designed capacity of 1,400 MW, approximately 665 km in length to provide an electrical link between Scotland and Norway.
NorthConnect Cable Corridor route	Term to describe the cable route associated with the NorthConnect interconnector project, which aims to connect Scotland and Norway and is currently consented in Scottish inshore and offshore waters (out to 200 NM).
Offshore	The offshore elements of the Project refer to works seaward of Mean High Water Springs (MHWS).
Offshore Substation and Converter Platform (OSCP)	A fixed structure located within the Array Area, containing electrical equipment to aggregate the power from the WTGs, act as a power distribution substation for the Oil & Gas platforms, and convert power between high-voltage alternating current (HVAC) and high-voltage direct current (HVDC) for export/import via the export/import cable to/from the shore.
Offshore Windfarm (OWF)	An offshore windfarm is a group of wind turbine generators in the same location (offshore) in the sea which are used to produce electricity.
Onshore	Pertaining to the landward side of Mean Low Water Spring
Pelagic	Of or relating to the open sea.
Pelagic Fish	Species partially living their life in the water column above.
Pelagic species	Species of fish that inhabit the water column (not near the bottom or the shore)

Term	Definition
Project	Term that should be used to describe Cenos Offshore Windfarm. The Project is a floating offshore windfarm located in the North Sea, with a generating capacity of up to 1,350 Megawatts (MW).
Project Area	Term to use to describe the areas within the consenting red line boundary.
Project Design Envelope	A description of the range of possible elements that make up the Project design options under consideration. The Project Design Envelope, or 'Rochdale Envelope' is used to define the Project for Environmental Impact Assessment (EIA) purposes when the exact parameters are not yet known but a bounded range of parameters are known for each key project aspect.
Ramsar site	A site listed under the Ramsar Convention 1972[24] for the protection of wetlands of international importance especially as waterfowl habitat.
Scoping Opinion	A Scoping Opinion is adopted by the regulator for a Project.
Scoping Report	A report that presents the findings of an initial stage in the Environmental Impact Assessment process.
Scottish Ministers	The devolved government of Scotland
Scour	A localised sediment erosion feature caused by local enhancement of flow speed and turbulence due to interaction with an obstacle.
Site of Special Scientific Interest (SSSI)	Sites notified at the national level under the Nature Conservation (Scotland) Act 2004[6]. They are a series of sites that are designated to protect the best examples of significant natural habitats and populations of species.
Special Area of Conservation (SAC)	International designation implemented under the Habitats Regulations for the protection of habitats and (non-bird) species. Sites designated to protect habitats and species in Annexes I and II of the Habitats Directive and sufficient habitat to be conserved to maintain favourable Directive and sufficient habitat to be conserved to maintain favourable conservation status of qualifying features.
Special Protection Area (SPA)	Sites designated under EU Directive (79/409/EEC) to protect habitats of migratory birds and certain threatened birds under the Birds Directive[20].
Stakeholder	Person or organisation with a specific interest (commercial, professional or personal) in a particular issue.
Study area	Area where potential impacts from the Project could occur, as defined for each aspect.
Sublittoral	The area seaward below low tide.
Subtidal	The region of shallow waters which are seaward below the level of low tide.
Suspended sediment concentration	The mass concentration (mass/volume) of sediment in suspension.
Targeted Oil and Gas (TOG) Onward Development Area	Term to describe the area of search within which connection to oil and gas platforms will be located.
Temporary or permanent effects	Effects may be considered as temporary or permanent within a timeframe of relevance to the aspect or receptor in question.

Term	Definition
The Crown Estate Scotland (CES)	The public corporation of the Scottish government that is responsible for the management of land and property in Scotland, as owned by the monarch "*in right of the Crown*".
Tidal excursion ellipse	The path followed by a water particle in one complete tidal cycle.
The Project	Cenos Offshore Windfarm.
Transboundary/ transboundary effects	When the impacts from developments in one country significantly affect the interest or environment of another country.
Transmission assets	Includes the OSCP and the offshore export/import cables. The OSCP will provide the connection point for the inter-array cables, bringing the power from the wind turbine generators (WTGs) to the OSCP; the connection points for the transmission cables connecting the oil and gas assets to the OSCP; the connection points for the high voltage direct current (HVDC) export/import cables; power transformers, HVDC converter and associated equipment metering and control systems. The OSCP HVDC converter, converts high voltage alternating current (HVAC) to HVDC power and vice versa to allow export and import of power from shore. Whilst excluded from this application, the transmission assets also include the onward grid connection.
Type or Nature of effect	Whether an effect is direct or indirect, temporary, short-term, medium-term or long-term or permanent, positive (beneficial), neutral or negative (adverse) or cumulative.
Unexploded Ordnance (UXO)	Explosive weapons (for example bombs, shells, grenades, naval mines) that did not explode when they were employed or discarded and still pose a risk of detonation, potentially many decades later.
United Kingdom (UK)	The United Kingdom of Great Britain and Northern Ireland, comprising England, Scotland, Wales and Northern Ireland.
Vårgrønn As (Vårgrønn)	Joint venture partner in the Applicant, to develop Cenos Offshore Windfarm (the Project).
Vulnerability	The propensity or predisposition of a system or receptor to be adversely affected. This encompasses the sensitivity of the system or receptor and its capacity to cope and adapt.
Wind Turbine Generator (WTG)	Term to describe the equipment associated with electricity generation from available wind resource, comprising the surface components located above the substructure which supports them (for instance, tower, nacelle, hub, blades, and any necessary power transformation equipment, generators, and switchgears).
Zone of Influence	The area surrounding the Project boundary which could result in likely significant effects.

List of Acronyms and Abbreviations

Acronym	Definition
AA	Appropriate Assessment
AC	Alternating Current
AfL	Agreement for Lease
BDMPS	Biologically Defined Minimum Population Scales
CCS	Carbon Capture and Storage
CEA	Cumulative Effects Assessment
CEF	Cumulative Effects Framework
CES	Crown Estate Scotland
CIEEM	Chartered Institute of Ecology and Environmental Management
cSac	candidate Special Area of Conservation
CRM	Collision Risk Modelling
DAS	Digital Aerial Surveys
DC	Direct Current
dSAC	draft Special Area of Conservation
DoB	Depth of Burial
EC	European Commission
ECC	Export/Import Cable Corridor
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
EMF	Electromagnetic field
EMODnet	European Marine Observation and Data Network
EPS	European Protected Species
EUNIS	European Nature Information System
EU	European Union
FCS	Favourable Conservation Status
FE	Flotation Energy
FPSO	Floating Production Storage and Offloading
FPSO vessel	Floating production storage and offloading vessel
FTU	Floating Turbine Unit
GeMs	Geodatabase of Marine features adjacent to Scotland
GW	Gigawatts
HabMoS	Habitat Map of Scotland
HDD	Horizontal Directional Drilling
HRA	Habitats Regulations Appraisal
HVAC	High-Voltage Alternating Current
HVDC	High-Voltage Direct Current
IAMMWG	Inter-Agency Marine Mammal Working Group

Acronym	Definition
INTOG	Innovation and Targeted Oil and Gas
INNS	Invasive Non-Native Species
IROPI	Imperative Reasons of Overriding Public Interest
JNCC	Joint Nature Conservation Committee
JV	Joint Venture
Km	kilometre
kV	Kilovolt
LSE	Likely Significant Effects
MAGIC	Multi-Agency Geographic Information for the Countryside
MarLIN	Marine Life Information Network
MARPOL	The International Convention for the Prevention of Pollution from Ships
MCAA	Marine and Coastal Access Act 2009
MD-LOT	Marine Directorate Licensing Operations Team
MLWS	Mean low-water spring
MHWS	Mean High Water Springs (tides)
M	Metres
Mm	Millimetres
MMMU	Marine Mammal Management Unit
MMO	Marine Management Organisation
MPA	Marine Protected Area
MU	Management Unit
MW	Megawatt
NRDC	Natural Resources Defence Council
NCMPA	Nature Conservation Marine Protected Area
NM	Nautical Miles
NMPi	National Marine Plan Interactive
NSTA	North Sea Transition Authority
OSCP	Offshore Substation and Converter Platform
OSPAR	Oslo and Paris Convention for the protection of the environment of the North-East Atlantic (may also refer to the convention's administrative body, the Oslo and Paris Commission)
PAM	Passive Acoustic Monitoring
PDE	Project Design Envelope
PMF	Priority Marine Feature
pSAC	possible Special Area of Conservation
pSPA	potential Special Protection Area
REZ	Renewable Energy Zone
RIAA	Report to Inform Appropriate Assessment
RSPB	Royal Society for the Protection of Birds
s.36	Section 36

Acronym	Definition
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
SEA	Strategic Environmental Assessment
SMA	Seal Management Areas
SMP	Sectoral Marine Plan
SNCB	Statutory Nature Conservation Body
SPA	Special Protection Area
SSCs	Suspended Sediment Concentrations
TLP	Tension Leg Platform
TOG	Targeted Oil and Gas (Onward Development Area)
UK	United Kingdom
UXO	Unexploded Ordnance
WTG	Wind Turbine Generator
ZoI	Zone of Influence

1. INTRODUCTION

1.1 Project Background

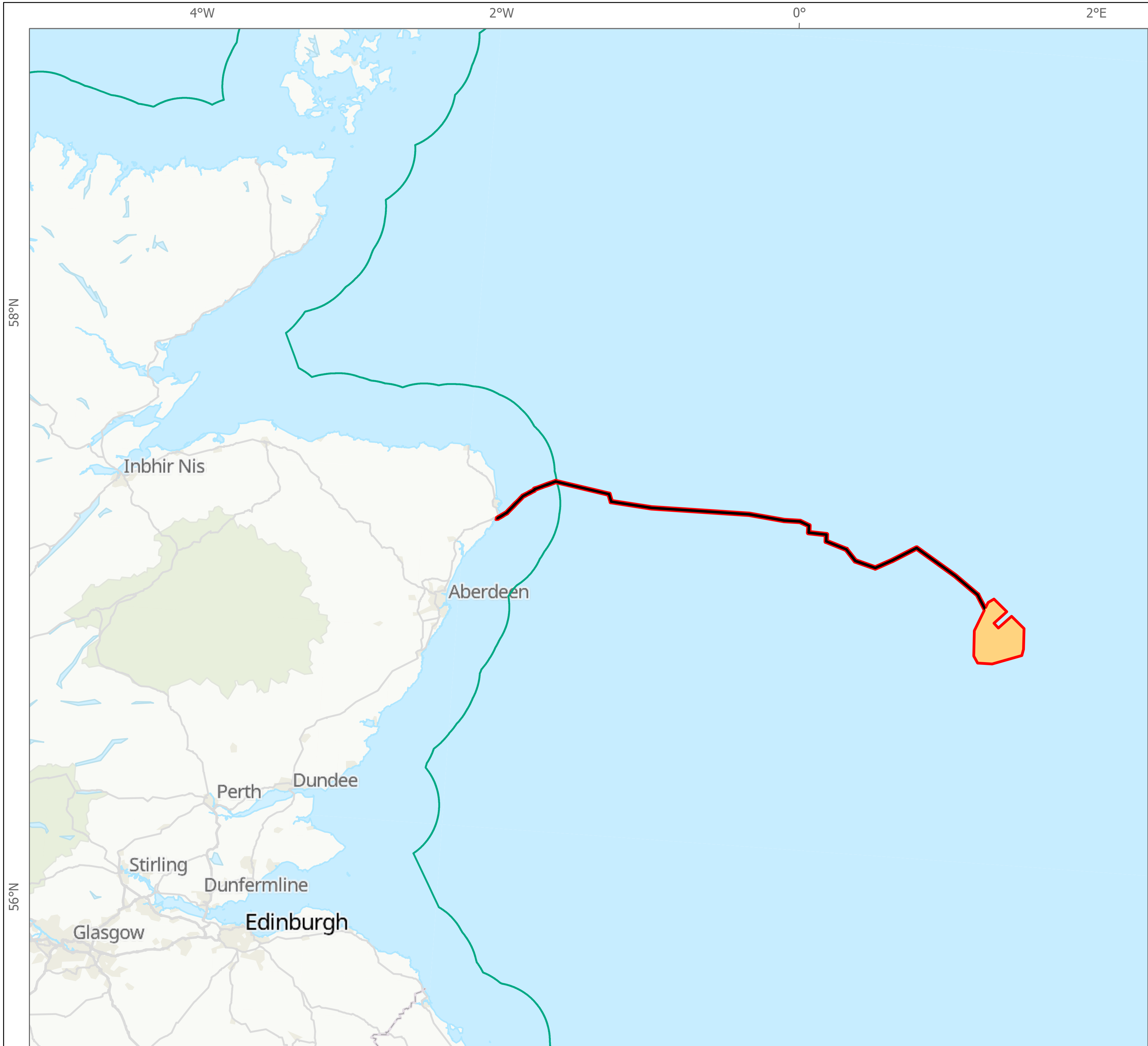
1.1.1.1 This report has been prepared to inform the initial screening stage of the Habitat Regulations Appraisal (HRA) process for the proposed Cenos Offshore Windfarm ('the Project'). Cenos Offshore Windfarm Ltd has been created as a 50/50 joint venture between Flotation Energy (FE) and Vårgrønn As (Vårgrønn) hereafter referred to as 'the Applicant'. The Project is planned to deliver 1.35 gigawatts (GW) of floating offshore wind energy in the United Kingdom (UK) Central North Sea in Scottish waters.

1.1.1.2 In November 2023, the Applicant signed the exclusivity agreement for the Project development under Crown Estate Scotland's Innovation and Targeted Oil and Gas (INTOG) leasing round. When completed, the windfarm will provide de-carbonised power to offshore oil and gas assets and provide a shore link to export excess power to the UK grid.

1.1.1.3 The Project is located approximately 185 kilometres (km) off the east coast of Scotland with an Array Area of approximately 333 kilometres squared (km^2). The Array Area will comprise the generation assets along with certain elements of the transmission assets (i.e. array infrastructure along with the Offshore Substation Converter Platform/s (OSCP)) as described in this report at **Chapter 4: Project Description**. The proposed Export/Import Cable Corridor (ECC) extends approximately 230 km from the western side of the Array Area and proceeds westerly, joining the same route as the consented NorthConnect Interconnector at approximately the 12 nautical miles (NM) limit as illustrated in **Figure 1-1**.

1.1.1.4 **Chapter 4: Project Description** provides an outline description of the Project and describes the activities likely to be associated with the construction, operation, maintenance, and decommissioning of the Project. It summarises the design and components of the Project infrastructure. It is based on conceptual design information and refinement of the Project parameters following receipt of the Environmental Impact Assessment (EIA) Scoping Opinion in June 2023.

1.1.1.5 The Project design will be updated to reflect the final Project Design Envelope (PDE), the feedback from the consultees received via the EIA Scoping Opinion, and stakeholder engagement. It will also consider site-specific survey data, along with recently published evidence which could change some conclusions of this report. Any changes, including those arising from further environmental surveys, consultee responses, and design refinements, will be reflected in the Report to Inform Appropriate Assessment (RIAA). Should it be determined by way of this Screening Report that a Likely Significant Effect (LSE) is anticipated, the RIAA will be submitted with the marine licence application under the Marine and Coastal Access Act 2009[7] and the Section 36 (s.36) Consent under the Electricity Act 1989 (as amended)[8].



LEGEND

- Array Area
- Proposed Export/Import Cable Corridor
- Project Area
- 12 NM Boundary

0 50
Kilometres

Data:
© National Grid UK
Esri, HERE, Garmin, USGS
Esri, HERE
Contains OS data © Crown Copyright and database right 2023
Contains data from OS Zoomstack

PROJECT: Cenos Offshore Windfarm

TITLE: Figure 1-1 Cenos Offshore Windfarm Project Area

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1.1.2 Consenting Strategy

1.1.2.1 A s.36 consent under the Electricity Act 1989 (as amended)[2] from Scottish ministers is required for the construction, extension, or operation of a marine-based generating station within Scottish territorial waters or the Scottish Renewable Energy Zone (REZ). Applications are considered by Scottish ministers where the generating capacity is in excess of 1 megawatt (MW) and the generating station is situated in the Scottish territorial sea (out to 12 NM from the shore), or where the generating capacity is in excess of 50 MW and the generating station is in the Scottish offshore region (12 – 200 NM). This consent will allow for installation and operation and maintenance (O&M) of wind turbines and inter-array cables associated with the generation of power by the Project.

1.1.2.2 In addition to the s.36 consent, a marine licence under the Marine and Coastal Access Act 2009[7] (as the proposed generation assets are outside 12 NM) will be required for the generation infrastructure to be placed on the seabed. A separate marine licence will also be required for the transmission assets under the Marine and Coastal Access Act 2009 (outside 12 NM) and the Marine (Scotland) Act 2010[9] (inside 12 NM).

1.1.2.3 The Project also falls under Schedule 2 of The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017[10] in relation to the onshore elements down to MLWS and Schedule 2 of The Marine Works (EIA) Regulations 2007[11] (as amended) in relation to the offshore elements up to Mean High Water Springs (MHWS). These regulations require an EIA to be undertaken if the size, nature, or location of the Project would indicate that it would likely have a significant effect on the environment. In this instance the Project scale in terms of wattage (approximately 1.4 GW) and area (Array Area approximately 333 km^2), and location within a Nature Conservation Marine Protected Area (NCMPA), are such that without further assessment potential significant effects cannot be ruled out. Hence it has been assumed by the project team that an EIA will be required.

1.1.2.4 The Applicant has identified the opportunity to coordinate with the NorthConnect Interconnector project to facilitate import and export of power, to and from shore, to support energy offtake by the oil and gas platforms (that is platforms, Floating production Storage and Offloading (FPSOs) and other production facilities) the Project aims to decarbonise. As such the Applicant is working collaboratively with NorthConnect Ltd.

1.1.2.5 Coordination between the Applicant and NorthConnect ensures only one set of infrastructure will be required within the overlapping marine licence redline boundary within the inshore marine environment (MHWS to 12 NM). As such, there will not be cumulative effects between the two projects within the inshore area. The Applicant now intends to apply for a marine licence which overlaps with NorthConnect within 12 NM as, since the original 2023 Scoping Report[12] was submitted, it is now the case that the Applicant may proceed before NorthConnect, and it may be the Applicant which constructs the infrastructure within 12 NM. Therefore, the Applicant is now seeking consent for all the offshore infrastructure, including that within the inshore are between 12 NM and MHWS. Refer to the 2024 EIA Scoping Report submitted in April 2024 for further information[13].

1.1.2.6 The Project is a targeted oil and gas decarbonisation project within the INTOG leasing process. The primary objective of the Project is to supply the surrounding oil and gas installations with renewable energy in order to power the platforms themselves with electricity, rather than the current use of gas turbine generators on each platform.

1.1.2.7 At the time of writing, the specific details of the oil and gas platforms (and the associated cable routes) that may benefit from exported power from the Project are yet to be finalised. This information may not be available in finality at the time of consent application for the Project; however, the best available information will be provided to support the consent application. Any required transmission cables and associated infrastructure will be subject to future separate licence applications which will be accompanied by detailed environmental and socio-economic impact assessment.

1.1.2.8 To support the application, a Targeted Oil and Gas (TOG) Onward Development Area will be considered on the basis of available knowledge, and within the bounds of commercial confidentiality within the EIA and HRA to inform the worst case assessment of potentially significant in-combination effects. These will be considered in the in-combination section of this HRA screening report.

1.1.3 Design Philosophy - Site Selection

Innovation and Targeted Oil and Gas (INTOG) Leasing Round

1.1.3.1 In 2022, the Scottish Government, as planning authority for Scottish waters, identified areas in the North Sea where projects targeting oil and gas decarbonisation would be considered through the INTOG leasing process. Cenos is a TOG project under the INTOG leasing round.

1.1.3.2 The aim of the Project is to meet the North Sea Transition Deal target of decarbonisation by 2030 through electrification of oil and gas facilities in the Central North Sea. As such, a site was selected for offshore wind development within a region of densely packed oil and gas facilities and prospective developments, which falls within the INTOG area of search "E-a". The INTOG plan and leasing process was set up to facilitate commercial relationships to form and aid identification of feasible development locations to ensure delivery as outlined below.

Array Area Constraints Mapping

1.1.3.3 Since the aim of the Project is to decarbonise offshore oil and gas extraction, the location to current oil and gas infrastructure needs to be considered as part of the offshore Array Area selection.

1.1.3.4 As described in the 2024 Scoping Report[13], oil and gas installations with the potential to be decarbonised must be located no more than 100 km from the Project electricity hub location. The oil and gas installations must be able to receive wind power from Cenos for a minimum of five years in line with requirements set out by CES INTOG leasing process. Since the target date of first power date from the Project is 2029, only oil and gas installations with an expected life beyond 2032 have been considered for electrification by Cenos.

1.1.3.5 Key constraints were mapped in and around the search area to inform more detailed siting of the Array Area, these included:

- Safe helicopter zones (6 NM radius from oil and gas assets);
- Oil and gas subsea assets and pipelines with 500 m buffers;
- Oil and gas licence blocks (licensed or likely to be auctioned);
- Areas of high vessel use density;
- Wrecks; and
- Minimising impact on commercial fishing activities.

1.1.3.6 The remaining area where a windfarm can feasibly be constructed that meets the objectives of decarbonisation whilst avoiding key constraints has resulted in a site within the East of Gannet and Montrose Field NCMPA. Information available at the time of initial site selection (2020) was utilised to avoid sub littoral mud areas of the NCMPA.

1.1.3.7 The search resulted in the identification of a 440 km^2 area which was taken forward for initial survey works.

1.1.3.8 The maximum area available to lease through INTOG is limited to 333 km^2. Hence, prior to lease application submission the survey area had to be refined to identify an area to meet the INTOG requirements. The survey area included the Madoes field which cannot be built upon and hence that area was removed, optimisation was then carried out for wind energy yield, to minimise inter-array cable length and distances to oil and gas assets.

1.1.3.9 Overall initial selection of the Array Area was driven by seabed leasing for offshore renewable energy generation, which is managed through a plan-led process. As planning authority for Scottish seas, the Scottish Ministers developed a sectoral marine planning programme to facilitate smaller innovation, and larger oil and gas decarbonisation offshore wind projects to gain access to seabed in locations identified in a planned manner. The INTOG Project Specification and Context Report[14] identified Areas of Search that formed the basis of the next planning processes. These areas were identified through a detailed opportunity and constraint analysis considered technical, social, and environmental constraints.

1.1.3.10 Based on consultation responses, the INTOG Initial Plan Framework (INTOG IPF)[15] provided the final Areas of Search. E-a, the Area of Search in which the Project is located, was not altered during the refinement process. These Areas of Search have therefore been assessed and considered suitable for offshore wind development.

1.1.3.11 As per the INTOG planning and leasing programme, a plan level Strategic Environmental Assessment (SEA) and HRA is now in progress by Scottish Government.

1.1.3.12 Amongst the information considered by the Scottish Government in developing the INTOG IPF was seabird usage distribution data produced by the Royal Society for the Protection of Birds (RSPB). These data align with the RSPB's own Indicative Area of Opportunity for floating wind (per The RSPB's 2050 Energy Vision report[16]).

1.1.3.13 This INTOG IPF process, combined with the work on oil and gas proximity and platform suitability along with a review of more specific environmental constraints has led to the identification of the current Array Area to be taken forward for more detailed assessment in the final RIAA.

Onward Development Area Identification

1.1.3.14 Cenos is currently discussing onward connections to several key oil and gas assets which operate as local hubs in the waters surrounding the Array Area for the purposes of electrification. An area of search of 100 km, which is roughly the limits for electricity transmission via an Alternating Current (AC) cable system, was utilised to first identify potential candidate oil and gas assets which could be electrified by Cenos (referred to as the 'Area of Opportunity').

1.1.3.15 The Area of Opportunity was then pared down to a Constrained Area of Search which considered environmental and technical constraints within the surrounding environment. This exercise limited the prospective area for connection to oil and gas assets via High Voltage Alternating Current (HVAC) cable infrastructure to a region which reflected early optimisation of potential cable routes to oil and gas assets within electrification distance.

1.1.3.16 Following this, in consultation with the North Sea Transition Authority (NSTA), consideration has been given to the role of these oil and gas assets as production hubs and their anticipated remaining production timelines to narrow down the list of prospective assets being considered for electrification. These prospective assets are included in the Onward Development Area surrounding the Project Area. The project continues to engage operators within this area, working towards commercial agreements to support their asset electrification, following consent award.

1.1.3.17 Cenos intends to consider potential cable routes for connection to individual assets in the forthcoming EIAR and RIAA. It is proposed that potential routes to the candidate oil and gas production assets will be mapped and approximately quantified to identify the environmental sensitivities within an optimised candidate area of seabed for cable laying.

1.1.3.18 These potential onward HVAC connections will be considered as part of the environmental assessments, albeit not as part of the marine licence application for the transmission of electricity to and from the UK grid via the High Voltage Direct Current (HVDC) cable infrastructure within the ECC. Rather, potential onward oil and gas connections will be considered in the inter-project effects assessment, as part of the in-combination assessment and cumulative effects assessment and will be preliminary but as full as possible based on the information available at the time of consent application.

1.1.3.19 Marine licences for these cables will be applied for separately in the future by the applicant(s) developing the transmission infrastructure connecting the oil and gas assets and the OSCP. Any such applications will be subject to further consultation with Marine Directorate - Licensing Operations Team (MD-LOT) to ensure they align with current guidance and legislation.

Offshore Export/Import Cable Corridor (ECC) Route Optioneering

1.1.3.20 The proposed offshore ECC extends for 230 km from MHWS to the centre of the Array Area, wherein the OSCP is anticipated to be located. The portion of the ECC extending from MHWS to the 12 NM limit for Scottish territorial waters follows the consented NorthConnect cable route emanating from the Aberdeenshire coastline. As outlined in **Chapter 4** of this report, the landfall site is located at Long Haven, just south of Boddam, Peterhead.

1.1.3.21 The section of the ECC from MHWS to 12 NM encompasses the consented NorthConnect cable route. NorthConnect submitted a RIAA, as part of its consent application, and the application received an Appropriate Assessment (AA) from MD-LOT[17] which concluded no adverse effect on the site integrity of the Buchan Ness to Collieston Coast SPA from the NorthConnect proposal either in isolation or in combination with other projects. A wider corridor has been adopted by the Applicant as part of the Project Area considered for this HRA. Therefore, the sensitivities identified and assessed by the NorthConnect project (Marine Licence reference numbers 06771 & 06870) which fall within this corridor will be additionally assessed by Cenos.

1.1.3.22 The Applicant is coordinating with NorthConnect Limited to share a single set of infrastructure within the overlapping consent boundary between MHWS and 12 NM. This coordination with the NorthConnect Interconnector project provides a strategic approach to electricity transmission to the UK power grid. Moreover, the use of a single set of cabling infrastructure minimises the potential for adverse effects on the inshore marine environment, including potential impacts to sensitive seabed and geomorphological features and species which utilise these waters intermittently (e.g. seabirds).

1.1.3.23 Transmission losses in HVAC cables increase with distance. The Project cable route is 230 km, as such HVDC technology which has much lower transmission losses is required. The use of HVDC cabling however requires the power generated by the wind turbines to be converted from AC to DC for transmission and for transmitted power to be converted back to AC to be exported onto the onshore grid. To justify the converter stations at either end there is a need for a minimum capacity in the system of 900 MW.

1.1.3.24 A comprehensive offshore cable route optioneering exercise was conducted to identify ECC routes which connect to landfall via the consented NorthConnect ECC that are not technically or commercially constrained, and which consider environmental sensitivities and known hazards. Two offshore routes were identified through this process which could supply electricity to/from the offshore array to the onshore connection point at landfall, via the inshore segment of the consented NorthConnect cable route. Both routes retain the option for future onward connection to Norway for NorthConnect via the offshore OSCP.

1.1.3.25 All routes considered known seabed conditions and environmental sensitivities (including protected sites), and wrecks and hazards, alongside existing offshore infrastructure (e.g. oil and gas platforms, oil pipelines, gas pipelines, cables, and all associated subsea assets) and planned infrastructure associated with offshore wind.

1.1.3.26 Overall, the corridors have been designed taking account of available data to:

- Minimise cable route length as far as practicable;
- Minimise the number of cable, pipeline, oil and gas lease area crossings;
- Avoid oil and gas assets including a safety exclusion zone;
- Avoid offshore wind energy plan areas;
- Avoid known wreck locations;
- Avoid all designated sites excluding the East of Montrose and Gannet Fields NCMPA which the Project is located within;
- Maximise the benefits of coordinated transmission within 12 NM by utilising the NorthConnect cable corridor route, and landfall location which connects to NorthConnect existing onshore infrastructure; and
- To provide synergy with a conceptual future export cable to Norway.

1.1.3.27 Cable Route A had a total length of 254 km and included seven asset pipeline or cable crossings, whereas Cable Route B had a total length of 227 km and included six asset crossings. Cable Route A was designed with the intention of minimising the need for new marine licenses and route engineering by utilising the consented NorthConnect cable corridor out to roughly 100 km offshore. However, the projects have been advised that Cenos would be required to apply for separate marine licences (both offshore and inshore – see Section 1.1.2) for the proposed ECC irrespective of existing concurrent consents. For this reason, Route A became much less attractive due to the compounding impacts to costs associated with manufacture, installation and maintenance associated with a 12 percent longer cable.

1.1.3.28 Cable Route B was therefore selected as the best option and the resultant ECC has been further informed by the Applicant's offshore environmental and geophysical survey campaign which supported the identification of the Project Area for the ECC, as presented in this report. Consequently, the original Cable Route B has been varied slightly to account for additional sensitivities identified during the offshore geophysical survey campaign. This has increased the route length by 3 km to 230 km.

1.2 Purpose of the Report

1.2.1.1 In Scotland, a HRA is required under Regulation 48 of the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended)[18] and Regulation 28 of the Conservation of Offshore Marine Habitats and Species Regulations 2017 (as amended)[19] (the Habitats Regulations). A person applying for any consent, permission, or other authorisation for a plan or project which is likely to have a LSE on 'European sites', must provide such information as the Competent Authority may reasonably require for the purposes of the assessment or to enable them to determine whether an AA is required. Therefore, the Applicant is responsible for assembling and describing all the relevant information required to enable the Competent Authority to carry out its HRA responsibilities.

1.2.1.2 MD-LOT is the Competent Authority for the purposes of the Habitats Regulations in relation to this project. The Habitats Regulations require competent authorities to carry out an AA in circumstances where a plan or project is likely to have a LSE on a European site (either alone or in combination with other plans or projects) before planning consent can be granted.

1.2.1.3 The purpose of this report is to provide MD-LOT with sufficient information to undertake its own HRA for the Project. This report covers HRA Stage 1: Screening only and not Stage 2: Appropriate Assessment. However, for completeness, an overview of the full HRA process has been described within this report.

1.2.1.4 There are over 200 Marine Protected Areas (MPAs) for nature conservation purposes in Scottish waters, covering approximately 108,000 km^2. Whilst many of these MPAs are aligned with existing sites relevant to HRA, a number have been designated directly under MPA legislation, through the Marine (Scotland) Act 2010[9], and the UK Marine and Coastal Access Act 2009[7], for inshore and offshore waters, respectively.

1.2.1.5 Under the above legislation the licensing authorities are required to consider whether the licensable activity applied for is capable of affecting (other than insignificantly) a protected feature in an MPA or any ecological or geomorphological process on which the conservation of any protected feature in an MPA is dependent.

1.2.1.6 A MPA Step 1 Screening is provided in the 2024 Scoping Report[13] submitted in April 2024.

2. THE HABITAT REGULATIONS APPRAISAL PROCESS

2.1 Legislative Context

2.1.1.1 In Scotland, the requirement to consider the potential effects of plans and projects on European sites falls under the following pieces of legislation:

- The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) [18] – applicable to marine licence applications out to the 12 NM limit;
- The Conservation of Offshore Marine Habitats and Species Regulations 2017[19] – applicable to marine licence and s.36 consent applications between the 12 and 200 NM limits; and
- The Conservation of Habitats and Species Regulations 2017 (of relevance to consents under s.36 of the Electricity Act 1989)[20].

2.1.1.2 The HRA process covers features designated under Council Directives 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora ("the Habitats Directive")[21] and 2009/147/EC on the conservation of wild birds ("the Birds Directive")[22] which were transposed into UK legislation post-Brexit by the Conservation (Natural Habitats, &c.) (EU Exit) (Scotland) (Amendment) Regulations 2019[23])'the 2019 Regulations').

2.1.1.3 The objective of the European sites is to conserve, at a Favourable Conservation Status (FCS), those habitats and species listed in Annexes I and II of the Habitats Directive and Annex I of the Wild Birds Directive. The sites designated under these Directives are collectively termed European sites and form part of a network of protected sites across Europe, known as the Natura 2000 network.

2.1.1.4 Following the UK's exit from the European Union, sites are designated under the Conservation (Natural Habitats, &c.) (EU Exit) (Scotland) (Amendment) Regulations 2019[23]. As a result of the UK's exit, Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) in the UK no longer form part of the EU's Natura 2000 ecological network. However, the 2019 Regulations have created a national site network on land and at sea, including both the inshore and offshore marine areas in the UK. The national site network includes existing SACs and SPAs, and new SACs and SPAs designated under these Regulations. Any references to Natura 2000 in the 2017 Regulations, and in guidance, now refers to the new national site network. This Screening Report has therefore been prepared on the basis that all relevant HRA-related legislation remains in place in accordance with the Habitats Regulations, as effected by the EU Exit Regulations.

2.1.1.5 The UK Government is also a signatory to the Convention on Wetlands of International Importance Especially as Waterfowl Habitat 1971 ("the Ramsar Convention")[24]. Within the Scottish Planning Policy[25] the Scottish Government sets out their policy that the Habitats Regulations should also apply to sites identified as Ramsar sites (under the Ramsar Convention on Wetlands of International Importance), as quoted from Policy 211: "*All Ramsar sites are also Natura 2000 sites […] and are protected under the relevant statutory regimes*".

2.1.1.6 For the purposes of this HRA, the term "European sites" and new national site network includes SACs, candidate SACs ("cSAC"), possible SACs ("pSAC"), draft SACs (dSAC), SPAs, potential SPAs ("pSPA"), Sites of Community Importance ("SCI"), listed and proposed Ramsar Sites and sites identified or required as compensatory measures for adverse effects on any of these sites. This is in line with the Habitats Regulations and relevant Government policy. The definitions of these sites are presented in **Table 2-1**.

Table 2-1: Definitions of European sites

European site	Definition
SAC	Formally designated site under the Habitats Regulations
cSAC	Sites submitted to the European Commission (EC) before the end of the Transition Period following the UK's exit from the EU, but not yet formally designated.
pSAC	Sites that have been formally advised to the UK Government, but not yet submitted to the EC.
dSAC	Sites that have been formally advised to UK government as suitable for selection as SACs.
SPA	Formally designated site under the Habitats Regulations
pSPA	Sites for which approval has been given for Statutory Consultation to classify the site.
SCI	Sites that were adopted by the EC before the end of the Transition Period following the UK's exit from the EU, but not yet formally designated by the government of each country.

2.1.1.7 Amongst other things, the Habitats Regulations define the process for the assessment of the implications of plans or projects on European sites. This process is termed the Habitat Regulations Appraisal.

2.1.1.8 The four-stage process of determining the absence of adverse effects on European sites under the Habitats Directives/Regulations is set out in more detail in Box 1 and in Section 2.2 overleaf.

Box 1 Stages of Habitats Regulations Appraisal

Stage 1 – Screening:

This stage identifies whether a plan or project is likely to have a significant effect on a European site (either alone or in combination with other plans or projects). Where LSE cannot be ruled out at this stage, the European sites will be "screened in" and assessed further.

Stage 2 – Appropriate Assessment:

Where there are LSE, this stage considers the adverse effects of the plan or project on the integrity of the relevant European sites, either alone or 'in combination' with other projects or plans, with respect to the sites' structure and function and their conservation objectives. Where there are adverse impacts, it also includes an assessment of the potential mitigation for those impacts.

Stage 3 – Assessment of alternative solutions:

Where adverse impacts (on the integrity of the site) are predicted, this stage examines (whether or not there are) alternative ways of achieving the objectives of the project or Plan that avoid adverse impacts on the integrity of European sites.

Stage 4 – Assessment where no alternative solutions exist and where adverse impacts remain:

This stage assesses compensatory measures where it is deemed that the project or plan should proceed for imperative reasons of overriding public interest (IROPI).

Stages 3 and 4 constitute the derogation provisions contained in Article 6(4) of the Habitats Directive.

2.2 HRA Process

2.2.1 Stage 1 – Screening

2.2.1.1 Screening can be used to screen out European sites and elements of works from further assessment, if it is possible to determine that significant effects are unlikely (for instance, if sites or qualifying features are clearly not vulnerable, exposed and/or sensitive to the outcomes of the Project, due to the absence of any reasonable impact pathways). Projects can also be screened out where they are directly connected with, or necessary to, the management of a European site. It is noted that this latter point is not applicable to the current Project.

2.2.1.2 The screening process has two potential conclusions, namely that the Project, alone or in-combination with other developments, could result in:

- No LSE on any of the qualifying features of the site; and
- An LSE is identified or cannot be ruled out.

2.2.2 Stage 2 – Appropriate Assessment (AA)

2.2.2.1 If one or more LSE are identified or cannot be ruled out, it is then necessary to proceed to Stage 2 where information will be provided through the means of a RIAA. This report considers the effects of a project, alone and in-combination, with other plans and projects, on the integrity of a designated site, regarding the European site's structure and function and its Conservation Objectives. The Competent Authority is then required to carry out an AA on the implications for a European site with respect of that site's Conservation Objectives, before deciding to undertake or give any consent, permission, or other authorisation for, a plan or project.

2.2.3 Stage 3 & 4 – HRA Derogation

2.2.3.1 Where the competent authority cannot conclude, beyond reasonable scientific doubt, that there is no adverse effect on site integrity from a plan or project, alone or in-combination, consent should not be granted unless the Project satisfies each of the following tests:

- There are no feasible alternative solutions that would be less damaging or avoid damage to the site (Stage 3 – Assessment of Alternatives);
- The proposal needs to be carried out for IROPI (Stage 4 – Assessment of IROPI); and
- Compensation measures are put in place to ensure that the overall coherence of the network of European sites is maintained.

2.2.4 Mitigation

2.2.4.1 On 12 April 2018, the Court of Justice of the European Union (CJEU) issued a judgment on Case C323/17 (People over Wind, Peter Sweetman v Coillte Teoranta) which stated (at paragraph 41):

> "*Article 6(3) of Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora must be interpreted as meaning that, in order to determine whether it is necessary to carry out, subsequently, an appropriate assessment of the implications, for a site concerned, of a plan or project, it is not appropriate, at the screening stage, to take account of the measures intended to avoid or reduce the harmful effects [mitigation] of the plan or project on that site*."

2.2.4.2 This means that any mitigation relating to European sites under the Habitats Regulations[21] will no longer be considered at the Stage 1 screening stage but can be considered at the AA stage to inform a decision on whether or not there may be adverse effects on site integrity.

2.2.4.3 The screening assessment provided within this report considers the CJEU ruling on 'People over Wind'. It has also adopted a strong precautionary principle; if a pathway of effect is established between Project and a European site, then that site is screened into the AA. This ensures all effects are captured, including *de minimis* effects.

2.2.4.4 With respect to Stage 2, the integrity of a European site relates to the site's conservation objectives and has been defined in guidance as "*the coherent sum of the site's ecological structure, function and ecological processes, across its whole area, which enables it to sustain the habitats, complex of habitats and/or populations of species for which the site is designated*"[26]. An adverse effect on integrity, therefore, is likely to be one which prevents the site from making the same contribution to favourable conservation status for the relevant feature as it did at the time of designation. The HRA screening process uses the threshold of LSE to determine whether effects on European sites should be the subject of further assessment. The Habitats Regulations do not define the term LSE. However, in the Waddenzee case (Case C-127/02)[27] the European Court of Justice found that an LSE should be presumed, and an AA carried out if it cannot be concluded on the basis of objective information that the plan or project will not have significant effects on the conservation objectives of the site concerned, whether alone or in-combination with any other project. The Advocate General's opinion of the Sweetman case (Case C-258/11)[28] (Judgment of the Court (Third Chamber), 11 April 2013) further clarifies the position by noting that for a conclusion of an LSE to be made "*there is no need to* ***establish*** *such an effect... it is merely necessary to determine that there* ***may*** *be such an effect*" (original emphasis).

2.2.4.5 For the reasons highlighted above, the assessment process follows the precautionary principle throughout and the word 'likely' is regarded as a description of a risk (or possibility) rather than in a legal sense an expression of probability.

3. SCREENING METHODOLOGY

3.1 Overview

3.1.1.1 This section outlines the HRA screening process which has been used throughout this report.

3.1.1.2 This report follows the procedures for screening described by the EC in the guidance document 'Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC'[29]. These steps are:

- Step 1: Determining whether the project or plan is directly connected with or necessary for the management of any European site;
- Step 2: Describing the Project (or plan);
- Step 3: Identifying the European sites and features with connectivity and potential effects on European sites; and
- Step 4: Assessing the presence of LSE on European sites.

3.2 Steps 1 & 2 – Project Description and Aims

3.2.1.1 The Habitats Regulations require assessment of plans or projects that are not directly related to the conservation management of a Natura 2000 site. This first step of the screening process is therefore to identify whether the plan or project in question is related to the conservation management of any European sites.

3.2.1.2 The EC guidance makes it clear that, for a project or plan to be 'directly' connected with or necessary to the management of a European site, the management must refer to measures that are for conservation purposes. The 'directly' element refers to measures that are solely conceived for the conservation management of a site and not direct or indirect consequences of other activities.

3.2.1.3 This Project comprises a 'plan or project', for the purpose of the Habitats Regulations, but is not directly connected with or necessary for the management of any European site. An AA may therefore still be required and so it is necessary to proceed to Steps 2 – 4 of the Screening Process.

3.2.1.4 The second step is to provide a project description to enable an assessment of LSE to be carried out, this is provided in **Chapter 4: Project Description**.

3.3 Step 3 – Identification of European Sites and Features with Connectivity

3.3.1.1 This step identifies European sites and features with connectivity to the Project. The identification of European sites is undertaken with reference to the qualifying features:

- Determining connectivity within the sites (for instance, if the Project is within breeding foraging range or non-breeding distribution of a qualifying feature); and
- Identifying the range of effects that the Project could have on qualifying feature(s) of a site (pathways for LSE).

3.3.1.2 The types of effects associated with windfarm development will vary in their magnitude and significance, depending on a range of factors including the type of technology and process involved, and the location and timing of activity. In respect to designated habitats and species populations, these effects may be direct (e.g. habitat loss associated with infrastructure installation) or indirect (e.g. via changes in water quality).

3.4 Step 4 – Determination of No Likely Significant Effect

3.4.1.1 Where it is determined that there is connectivity between the Project and the qualifying features of a site, further assessment is required to assess if there is a potential for LSE.

3.4.1.2 Screening is based on a conceptual 'source-pathway-receptor' approach:

- **Source**: the origin of a potential impact (noting that one source may have several pathways and receptors), for example, piling.
- **Pathway**: the means by which the effect of the activity could impact a receptor, for example, noise from piling.
- **Receptor**: the element of the receiving environment that is impacted, for example, marine mammals within the direct range of the noise disturbance.

3.4.1.3 Where there is no pathway, or the pathway has sufficient distance such that the impact from the source has dissipated to a negligible level before reaching the receptor, there may be justification for the screening out of that receptor (for instance, a qualifying feature) for the site in question.

3.4.1.4 Sites are screened in if, for any of their qualifying features, a source-pathway-receptor relationship and potential for LSE cannot be ruled out (including in combination effects). However, each qualifying feature of that site will be considered separately, and it may be that the screening process rules out LSE for some features at this stage.

3.4.1.5 As described in Section 2.2.4, mitigation is not taken into account at this stage but will be considered where relevant in the AA.

3.4.1.6 The approach to screening for each receptor is outlined in **Chapter 6 Benthic Ecology Screening**, **Chapter 7 Marine Mammals Screening** and **Chapter 8 Offshore Ornithology Screening** and is based on the known distribution, ecology, and sensitivities of each receptor group and, therefore, the potential for being affected by the Project. Where there is insufficient information available at this stage to screen out a site, the site is screened in for further consideration.

3.4.2 In-combination Screening Methodology

3.4.2.1 The Habitats Regulations require that the potential effects of a project on designated sites are considered both alone and in-combination with other plans or projects. Offshore plans or projects that may be considered include, but are not limited to:

- Other offshore windfarms;
- Other renewables development;
- Aquaculture/mariculture;
- Aggregate extraction and dredging;
- Licensed disposal sites;
- Shipping and navigation;
- Planned construction sub-sea cables and pipelines;

- Potential port/harbour development;
- Carbon capture and storage (CCS);
- Oil and gas development and operation, including seismic surveys; and
- Unexploded Ordnance (UXO) clearance.

3.4.2.2 Discussions will be held with MD-LOT and other statutory consultees, including NatureScot, to identify any other relevant plans and projects that should be included. In line with MD-LOT advice in the public domain for other windfarm developments, this will consider operational windfarms and those under construction (including those in English waters, or other non-UK parts of the North Sea if there is relevance, connectivity, or the potential of a cumulative effect), those consented but not yet under construction, and those not yet consented but undergoing the consenting process. In relation to future protects, the Project will consider projects that have submitted a scoping report up to four months prior to application submission.

3.4.2.3 For each project, a review of all available information will take place and the current position with the Project or plan will be identified. The proposed methodology for this assessment is discussed in **Chapter 9: In-combination Assessment**.

3.4.2.4 At the time of writing, it is noted that MD-LOT and NatureScot are currently producing a Cumulative Effects Framework (CEF) that focuses on Cumulative Effects Assessment (CEA) in Scotland[30], and this CEF will be drawn upon if available at the time of writing the EIAR and RIAA.

3.5 Approach to Screening

3.5.1 Identification of Sites and Features with Connectivity

3.5.1.1 Given the large spatial scale and nature of Project and the number of European sites that could potentially be affected, HRA Screening is fronted by an initial site selection process, to identify sites and features for consideration through Screening. The potential effects associated with the construction, operation and maintenance and decommissioning of the Project (i.e. all infrastructure relating to the Project as defined in **Chapter 4: Project Description**) are presented in Sections 6.2, 7.2, and 8.2.

General Criteria

3.5.1.2 The HRA screening exercise considers sites selected using the general criteria set out in **Table 3-1**. These criteria are expanded on in the following subsections to consider the receptor's sensitivities, ecological characteristics and specific behaviours and the type of European site that could be affected, during the different phases of the Project (construction, operation and maintenance or decommissioning).

Table 3-1: HRA screening criteria

Criterion	Rationale
1	Designated sites with physical overlap or functionally linked habitat located with the Project area.
2	Designated sites with qualifying mobile species that may interact with potential effects from the Project due to their range (such as breeding and foraging zones, as well as natural habitat).
3	Designated sites with a qualifying feature located within the potential range of effect (identified Zone of Influence) associated with the Project. This includes mobile features which may interact with the Project when overwintering or when on migration.

3.6 Consultation

3.6.1.1 The HRA will rely on the assessments presented in the receptor-specific chapters which have been consulted on. The scope of screening, approach, evidence base, and potential effects/receptors will be discussed in consultation with stakeholders, which are anticipated to include:

- MD-LOT;
- NatureScot; and
- Natural England.

3.6.1.2 Where applicable, consultation will also be undertaken with other bodies as required. This may include on transboundary issues, for example with the Norwegian Environment Agency. Initial consultation will be conducted around the contents of this report, following its submission, and in line with the remaining stakeholder and public consultation for the Project.

3.6.1.3 Whilst not specifically regarding the HRA process, a number of comments were received in the 2023 Scoping Opinion[31], which are considered relevant to the HRA. These are presented in **Table 3-2.**

3.6.1.4 In February 2024, the Applicant held a Scoping Workshop with MD-LOT and statutory advisors including Marine Directorate Marine Analytical Unit (MD-MAU), Marine Directorate Science, Evidence Data and Digital (MD-SEDD), Joint Nature Conservation Committee (JNCC) and NatureScot. The workshop provided an opportunity to present a Project update and to detail the proposed approach to both EIA scoping and HRA. Commentary from the workshop is presented in **Table 3-2.**

3.6.1.5 Follow up correspondence from the Scoping Workshop was received from NatureScot on 2 April 2024 as detailed in **Table 3-2.** The discussions during and since the Scoping Workshop have informed this report.

3.6.1.6 A key aspect of the advice received is that diadromous fish should not be assessed within the remit of HRA and should solely be assessed within the EIA process.

3.6.1.7 NatureScot's reasoning is based on there being limited knowledge of distribution and behaviour of diadromous fish species in the marine environment, for example uncertainty around migratory routes and connectivity to protected sites. NatureScot stated in their response;

"We advise based on evidence currently available to us, it is not possible for us to carry out an assessment of diadromous fish to the level required under HRA. We therefore advise that diadromous fish species should be assessed through EIA only and not through HRA"

3.6.1.8 The Applicant agrees with this position. Fish are therefore not considered further in this HRA screening report based on current best practice. This is in line with established current precedent set within published HRA Screening Reports for West of Orkney Windfarm[32], Bellrock Windfarm Development Area[33] and Broadshore Hub Wind Farm Development Area[34], which all following similar NatureScot advice.

Table 3-2: Summary of Stakeholder consultation

Stakeholder	Comment	Response
NatureScot advice on 2023 Scoping Report. May 2023	*"In terms of methods to undertake the assessments, the information provided is either not sufficient, deviates from our guidance or is missing. We are therefore unable to understand what will be included in the application and supporting EIAR, HRA and the nature conservation MPA assessment or know if it will be sufficient to inform our assessment."*	The Applicant has produced a new Scoping Report for the Project where updated methodology is presented. The 2024 Scoping Report[12] was issued in April 2024. The HRA methodology is detailed in **Chapter 3: Screening Methodology** of this HRA Screening Report.
NatureScot advice on 2023 Scoping Report. May 2023	*"The scoping report suggests the potential for marine mammals to be scoped out of further consideration but, in the absence of completed baseline data, we advise these should be included for further consideration for now."*	The marine mammal receptor is included within the HRA Screening process. The appropriate European sites are identified in Sections 6.1 to 6.3 and the determination of LSE for this receptor is made in **Chapter 7: Marine Mammal Screening**.
Natural England advice on Scoping Report. May 2023	*"Natural England consider that the majority of matters in which we have an interest for English waters have been adequately considered in the EIA Scoping Report with the exception of advising more designated sites are considered further.* *For completeness, there are additional protected sites in the North of English waters that we advise the applicant considers going forward. These are:* *Berwickshire and North Northumberland Coast SAC – designated for grey seal (Halichoerus grypus) and benthic features.* *Flamborough and Filey Coast SPA – designated for gannet (Morus bassanus), breeding; guillemot (Uria aalge), breeding; kittiwake (Rissa tridactyla), breeding; razorbill (Alca torda), breeding; seabird assemblage, breeding.* *Farne Islands SPA – designated for Arctic tern (Sterna paradisaea), breeding; common tern (Sterna hirundo), breeding; guillemot (Uria aalge), breeding; roseate tern (Sterna dougallii), breeding; Sandwich*	The referenced European sites have been included within the HRA Screening process. This is documented in Sections 6.1 to 6.3 and **Chapter 7: Marine Mammal Screening** of this HRA Screening Report where the qualifying features of these SPAs are subject to determination for LSEs.

Stakeholder	Comment	Response
	tern (Thalasseus sandvicensis), breeding; seabird assemblage, breeding"	
RSPB response to 2023 Scoping Report. 16 June 2023	*"RSPB Scotland encourage the adoption of a precautionary approach to the identification of relevant protected sites for seabirds with clear methodology on the exclusion of sites and species. We generally agree with the collection and analysis methods advised by NatureScot, with some exceptions as set out below. We recommend use of the guidance notes available on their website to inform assessment. If an Applicant chooses to undertake supplementary modelling using alternative parameters to that recommended, we suggest this is clearly labelled."*	The Applicant will follow the published NatureScot marine ornithology guidance notes. Any variations from this guidance will be highlighted and explained. Guidance Note 1: Guidance to support Offshore Wind Applications: Marine Ornithology - Overview[35]
	"As set out in Searle et al (2023)1, assessing impacts of offshore windfarms and other renewables developments is inherently uncertain. This uncertainty is propagated throughout the impact assessments, as there are not only direct impacts, but ecosystem wide impacts that can change, for example, the abundance and availability of prey. Multiple data sources and modelling techniques are used to capture a simplified version of reality. They do not fully capture the complexity of seabird behavioural or demographic processes in a dynamic marine environment."	The Applicant appreciates that there may be uncertainties in any ornithological impact assessment, relating to both data and modelling. The Project will consider these uncertainties when assessing potential impacts. Published guidance and the most recent scientific papers will be referenced to ensure the most up-to-date methods of assessment are used alongside the best available evidence.
	"The precautionary principle requires the Applicant to demonstrate with scientific certainty that something would not be harmful. The concept of something being overly precautionary dismisses the inherent uncertainty in modelling and overlooks the simplistic version of reality that the modelling captures."	The Applicant will follow the published NatureScot marine ornithology guidance notes. Any variations from this guidance will be highlighted and explained.
	"The RSPB has outstanding issues with the manner in which the bio-seasons definitions from Furness (2015)2 have been defined for gannet and kittiwake. This is because by using the "migration-free" seasonal definition as opposed to full breeding season the early and later months of the season are effectively excluded. For example, the	The Applicant appreciates that there may be uncertainties in any ornithological impact assessment, relating to both data and modelling. The Project will consider these uncertainties when assessing potential impacts. The published guidance

Stakeholder	Comment	Response
	kittiwake breeding season is defined as May to July, when evidence from colony monitoring shows that birds are present from April at least to August. In the latter part of the season all birds will have fledged but individual birds will still be present with both young and adult birds coming back to the cliff. These are still SPA birds, and those most likely to be affected by impacts from the development."	and most recent scientific evidence from NatureScot definitions for the breeding season will be followed (which do not use the definitions from Furness[36]). NatureScot's breeding season for kittiwake covers mid-April to August, and for gannet it is mid-March to September. Guidance: Seasonal Periods for Birds in the Scottish Marine Environment[37]
	"We welcome using foraging ranges as published in Woodward et al. (2019)[3] to derive connectivity with SPA colonies. We also recommend that site specific data are examined and where the maximum foraging range from the colony exceeds the generic value, that the site-specific value is used. *The exceptions to this are for common guillemot and razorbill. Tracking on Fair Isle showed foraging for both common guillemot and razorbill distances are greater than those of all other colonies. This may relate to poor prey availability during the study. However, trends for seabirds in the Northern Isles indicate this may be becoming a more frequent occurrence. For all designated sites south of the Pentland Firth (i.e. excluding the Northern Isles), we advise use of mean max (MM) plus one standard deviation (SD) discounting Fair Isle values. For clarity, North Caithness Cliffs SPA is considered to lie south of the Pentland Firth.* *In the non-breeding season, seabirds are not constrained by colony location and can, depending on individual species, range widely within UK seas and beyond."*	The Applicant will follow this published NatureScot marine ornithology guidance notes. Any variations from this guidance will be highlighted and explained. Guidance Note 3: Guidance to support Offshore Wind applications: Marine Birds - Identifying theoretical connectivity with breeding site Special Protection Areas using breeding season foraging ranges[38]

Stakeholder	Comment	Response
	"Whilst the RSPB agree with the majority of the NatureScot advised Avoidance Rates including the use of a 98.9% avoidance rate for non-breeding gannets, in our opinion, a 98% avoidance rate is more appropriate for breeding gannets. This is because the figures used for the calculation of avoidance rates advocated by the SNCBs are largely derived from the non-breeding season for gannet. During the breeding season, gannets are constrained to act as central placed foragers meaning they return to the colony after feeding in order to maintain territories, incubate eggs and provide for chicks. Once chicks have fledged adult gannets remain at sea and no longer visit the colony. Differences in behaviour between the breeding and non-breeding season are likely to result in changes in avoidance behaviour. *This seasonally defined change in reactive behaviour will also be reflected in the distributional changes occurring due to the presence of turbines. As such, alongside the 70% displacement rate recommended by NatureScot for the assessment of gannet, we recommend the presentation of 60% displacement rate during the breeding season."*	The approach taken for Scottish projects has been to use the avoidance rates from SNCB[39] and Ozsanlav-Harris *et al*[40]. The Applicant notes the recommendation to use a more precautionary rate for breeding gannets and can run the Collision Risk Modelling (CRM) for this species at 98%. The displacement rate of 70% is more precautionary than 60%, and so usually presented in the assessment. However, the 60% results will be available in the full matrices presented in **Appendix B**.
	"An EIA report must include a description of the likely significant effects of the development on the environment. RSPB are frequently presented with a matrix approach to significance which combines the value of a rector with the magnitude of impacts. This formulaic approach is one way to present significance, but the categorisation is not biologically meaningful and may not be the best way to assesses the significance of impacts. Furthermore, the uncertainty in the score, as described by Wade et al., (2016) is typically not incorporated into this approach. This should be case, and we would recommend doing	Whilst the Applicant understands the reservations relating to the matrix approach, it is the accepted approach within EIA assessment for ornithological receptors. Within the magnitude and sensitivity definitions, we will articulate meaningful metrics acted on the regional population. Further explanation around the conclusions of significance (including uncertainty) will be provided within the EIAR chapter.

Stakeholder	Comment	Response
	so following the principal that the greater the uncertainty the greater the need for precaution (Searle et al., 2023).”	
	“RSPB Scotland disagree with the magnitude of impact being assessed in terms of predicted increases to baseline mortality. As above, small increases in mortality can have large impacts. It is more meaningful to view impacts across the lifeline of the development in comparison to population size in the absence of the development and consider long-term viability of colonies and time for recovery.”	The Applicant will follow NatureScot guidance for PVA modelling, and will present the two metrics as recommended: *“We advise the two ratio metrics that compare impacted and un-impacted populations should be applied in both EIA and HRA. The two metrics that should be used are generally termed ‘Counterfactual (ratio) of final population size’ (CPS) and ‘Counterfactual (ratio) of population growth-rate’ (CPC).”* Guidance Note 11: Guidance to support Offshore Wind Applications: Marine Ornithology - Recommendations for Seabird Population Viability Analysis (PVA)[41]
MD-LOT Scoping Opinion on 2023 Scoping Report. 28 June 2023	*“The Scottish Ministers advise that the Developer should consider the Natural England response regarding the Berwickshire and North Northumberland Coast SAC. The Scottish Ministers cannot provide any further, detailed advice in regards to this receptor.”*	The Applicant has taken into consideration Natural England’s request. The referenced European site has been included within the HRA Screening process. This is documented in Sections 6 and 7 of this HRA Screening Report.
	“The Scottish Ministers strongly advise the production of a Habitats Regulations Appraisal (“HRA”) screening report for the Project and recommend that this should be submitted for comment at the earliest opportunity and in advance of the submission of the EIA Report in order to fully inform the HRA advice for the Project.”	This HRA Screening Report has been produced as per MD-LOT’s recommendations.

<table>
<tr><th>Stakeholder</th><th>Comment</th><th>Response</th></tr>
<tr><td>Scoping Workshop
29 February 2024</td><td>Ornithology

Methodology and key assumptions for assessment were presented, in line with the detail presented in this scoping chapter, to NatureScot and MD-LOT. The presentation included information on the baseline data collected, and the approach to the consideration of Avian Influenza.

It was clearly stated that the assessment would follow the NatureScot suite of guidance documents.

Confirmation obtained from NatureScot during workshop, that:
• There are no further guidance/policy documents to be aware of;
• There is no updated guidance currently available.
• The study regions as defined were appropriate.
• Direct disturbance should also be included for the operational phase.
• The proposed approach to cumulative effects, transboundary and interrelated effects were agreed.
• mCRM tool not yet available

Confirmation of the following was not available during the workshop:
• Until DAS report reviewed, the species scoped into assessment cannot be agree.
• Acceptability of the proposed approach to derive guillemot non-breeding seasonal regional populations.
• Approach to fulmar colonies to be included for the breeding season regional population for collision risk modelling
• Approach to non-breeding season apportioning for guillemot.</td><td>Direct disturbance during operation and maintenance from vessel movements will be included in the assessment.

Collision risk to migratory species will be assessed qualitatively.</td></tr>
</table>

Stakeholder	Comment	Response
	Marine mammals The following key agreements made in relation to the scope of the EIA/HRA: - No additional data collection or data sources requested to be included; - No other marine megafauna to be considered; - Additional explanation and justification for scoping out collision risk with vessels is required including details of proposed mitigation actions; and Additional evidence on the reasoning for scoping out secondary entanglement.	The Applicant has included the agreed approaches in the HRA Screening Report where relevant.
	Benthic ecology The Applicant provided details on the proposed approach for Benthic Ecology assessment for the EIA/HRA. It was agreed to screen in electromagnetic fields (EMF), heat and invasive non-native species (INNS).	The landfall will be constructed using HDD from the cliff top to an exit pit approximately 200 m offshore, therefore there will be no activity in the intertidal zone. Operating cables generate heat and EMF that may locally affect benthic organisms. Tunnelling under shoreline will attenuate EMF and heat emissions and no significant radiation from the cable is anticipated to be evident at the surface. It is not anticipated that EMF or heat will affect the vegetated sea cliffs of the Buchan Ness to Collieston SAC and it is therefore screened out of the assessment, see section 6.3.1.3.
Further comments on Scoping Workshop	**Ornithology**	Puffin is assessed accordingly in this Screening Report. With regards to fulmar, while SPAs within

Stakeholder	Comment	Response
from NatureScot 2 April 2024	*'The species scoped in are those that were most abundant in the DAS and therefore should be considered for assessment. Puffin should also be included.* *However, fulmar is not considered to be at high risk of collision impacts, as flight height is generally close to the sea surface and below potential collision height. It is standard practice that collision risk modelling is not undertaken for this species and fulmar is generally scoped out at the stage of considering impact pathways. '*	foraging range are highlighted, it is concluded that there are no Likely Significant Effects from collision impacts.
	'In terms of HRA, for guillemot in the non-breeding season we advise the use of breeding season populations within foraging range, rather than BDMPS populations, as they tend to stay in vicinity of breeding colonies. For this site there are no SPAs within foraging range so there is no need for an HRA assessment for guillemot in the non-breeding season. *However, we recommend that a displacement assessment using the BDMPS regional population, without SPA apportionment, should be presented in the EIA Report with justification for any conclusions.'*	Screening for guillemot has used breeding populations within foraging range as the basis of the determination of Likely Significant Effects within this HRA Screening Report.
	'There is a need for ongoing engagement in relation to the impacts of Highly pathogenic avian influenza (HPAI) and how to incorporate these impacts within assessments. Work is continuing within NatureScot to provide further information which we will do when we can. In the meantime, we expect the impact of HPAI on colonies to be considered qualitatively especially when reviewing PVA outputs. *As the DAS survey work straddles the HPAI outbreak it will be important for assessment purposes to consider the current status of seabird populations at SPA colonies. Surveys have been undertaken at a number of key seabird colonies in 2023, coordinated by RSPB,*	The Applicant confirms that recent data found on the SMP database will be utilised within the RIAA, and that the RSPB report on HPAI effects will be used to inform assessment.

Stakeholder	Comment	Response
	and some will be repeated in 2024. Recent data for key species at some sites can already be found on the SMP database. *RSPB have just published a report on HPAI effects which will provide helpful context:* *UK seabird colony counts in 2023 following the 2021-22 outbreak of Highly Pathogenic Avian Influenza Research Report 76. RSPB Conservation Science (https://www.rspb.org.uk/birds-and-wildlife/seabird-surveys-project-report).'*	
	Entanglement - We advise that secondary entanglement (e.g. ghost nets entangled on subsea mooring lines) should be scoped in as a potential impact pathway during the operation and maintenance phase. Although there is limited evidence of secondary entanglement occurring, it's possible this is due to limited monitoring. Also, floating wind is a relatively new technology and the small demonstration inshore floating sites don't compare to the larger sites offshore. Further, fishing patterns may change once the proposed wind farm is operational through the displacement of fishers from other areas, which could lead to more lost equipment in the area that isn't perhaps currently seen. Lastly, the forthcoming scaling up of turbines in the ocean may result in a cumulative risk effect for secondary entanglement. *That said, we are mindful that during the workshop there was discussion around potential evidence and experience from other floating offshore assets that could provide useful information and context with respect to this impact pathway. We would be happy to review this and advise further.'*	The Applicant has presented evidence in sections 7.2 and 8.2 of the HRA Screening Report and in the Scoping Report[13] (specifically Chapter 5, Chapters 10-12 and Appendix 5G[42] Approach to secondary entanglement as a potential impact) on screening out primary and secondary entanglement for all receptors, including seabirds.
	'Wet storage - Impact pathways associated with wet storage activities should be considered for ornithology. We appreciate that	The wet storage of turbines outside of the Array Area in close proximity to a port is linked to a decision on

Stakeholder	Comment	Response
	there are ongoing discussions regarding who has the responsibility for assessing impacts arising from wet storage and so we raise here just to highlight that it could represent a very significant impact pathway for ornithological receptors. '	construction and marshalling port(s) and as such potential impacts associated with wet storage are proposed to be screened out of this assessment.
	Diadromous fish *'We note that for diadromous fish species there is limited knowledge of distribution and behaviour of these species in the marine environment. For example, the precise migration routes of adult or juvenile Atlantic salmon or direction taken by migrating adult European eels is not fully known. Published information indicates that European smelt and River lamprey are primarily, though probably not exclusively, associated with estuarine environments. Shad might also prefer estuarine environments.* *Furthermore, for some species, like seals, we have a reasonable understanding of connectivity to individual SACs. We also have population estimates for nearly all seal SAC populations in the standard data forms which forms part of the citation package. For diadromous fish species we do not have population data for any salmon or lamprey SAC on the data forms.* *This inability to understand connectivity to and within individual rivers to the development area, currently prohibits an informed assessment of the impact on individual site integrity. This is a necessary step within HRA assessment process.* *The recently updated ScotMER evidence map4 process for diadromous fish confirms these evidence gaps, particularly with respect to spatial and temporal distribution as well as uncertainty*	In line with NatureScot's advice, diadromous fish are not considered in this HRA Screening report.

Stakeholder	Comment	Response
	around migration routes and connectivity to protected sites. The ScotMER process is an important vehicle for helping to address these evidence gaps and uncertainties. We specifically welcome the ScotMER project 'Diadromous Fish in the Context of Offshore Wind – Review of Current Knowledge & Future Research' due to be published soon. However, this research is not expected to significantly change our conclusions on how diadromous fish are treated in both EIA and HRA going forward. *We advise based on evidence currently available to us, it is not possible for us to carry out an assessment of diadromous fish to the level required under HRA. We therefore advise that diadromous fish species should be assessed through EIA only and not through HRA. We advise that offshore wind developers should be contributing to ScotMER research as well as other initiatives such as the Wild Salmon Strategy Implementation Plan5 and any other strategies that are developed for diadromous fish interests.'*	
	Marine mammals *'We advise that secondary entanglement (e.g. ghost nets entangled on subsea mooring lines) should be scoped in as a potential impact pathway during the operation and maintenance phase. Although there is limited evidence of secondary entanglement occurring, it's possible this is due to limited monitoring. Also, floating wind is a relatively new technology and the small demonstration inshore floating sites don't compare to the larger sites offshore. Further, fishing patterns may change once the proposed wind farm is operational through the displacement of fishers from other areas, which could lead to more lost equipment in the area that isn't perhaps currently seen. Lastly, the forthcoming scaling up of turbines*	Entanglement: The Applicant has presented evidence in sections 7.2 and 8.2 on this HRA Screening Report and Scoping Report[12] (specifically Chapter 5, Chapters 10-12 and Appendix 5G[42] Approach to secondary entanglement as a potential impact) on screening out primary and secondary entanglement for all receptors. Electromagnetic Field (EMF): The Applicant can confirm radiation from energised cables may affect the behaviour of marine mammals has been scoped out, however radiation from energised cables may affect prey species distribution/prey availability

Stakeholder	Comment	Response
	in the ocean may result in a cumulative risk effect for secondary entanglement. *That said, we are mindful that during the workshop there was discussion around potential evidence and experience from other floating offshore assets that could provide useful information and context with respect to this impact pathway. We would be happy to review this and advise further.* *It was confirmed in the workshop that the pathway "secondary effects relating to prey distribution" would include indirect EMF effects and changes to fish distribution (e.g. aggregation). We agree that this pathway should be scoped in for the operation and maintenance phase.* *We agree that direct EMF effects can be scoped out.* *Regarding vessel based collisions, we would expect to see clear explanation and justification for scoping out collision, along with details of good practice measures to be implemented.'*	during operation and maintenance phase has been screened in. See sections 7.2 and 7.3. Vessel collisions: The likelihood for vessel interactions during the Project is extremely low. Avoidance behaviour by cetaceans is often associated with unpredictable boats transiting at higher speeds. Slower vessels following a consistent trajectory allow marine mammals the opportunity to avoid collisions. The probability of collision is estimated to decrease to <50% when large vessels reduce speeds to 10 knots and fatal collisions are more likely when vessels are transiting at higher speeds. The risk of collision increases in areas of high animal density and with species that are more likely to spend time close to the surface, such as baleen whales. Species such as harbour porpoise, which are the most frequently sighted species within the Array Area, have been recorded to dive deeper in the presence of vessels reducing the potential for collision. With embedded mitigation, the risk to the more susceptible species (minke whale) is negligible. Given the extremely low likelihood of interaction between any project vessels and marine mammal receptors, it is proposed to screen physical vessel interactions out.

4. PROJECT DESCRIPTION

4.1 Introduction

4.1.1.1 This chapter provides an outline description of the Project and summarises the key design components. It also describes the key activities that will be undertaken during construction, operation and maintenance, and decommissioning, in addition to key parameters and indicative timescales.

4.2 Project Overview

4.2.1.1 The Project is a floating offshore windfarm which shall supply electricity to the UK Grid and pioneer large-scale floating wind in the UK. Additionally, the Project shall facilitate decarbonisation of the UK Oil & Gas industry by provision of electrical power to offshore oil and gas installations, delivering emissions reductions on the FCESUK continental shelf. It is part of the INTOG leasing process currently being undertaken by CES.

4.2.1.2 The connection to shore will provide electricity to the oil and gas assets if power is not available from the windfarm, this will provide certainty to the oil & gas operators to fully undertake the major modifications required to achieve electrification and achieve tangible, substantive, emissions reductions. The majority of the power from the Project will be exported to the UK grid to support overall UK decarbonisation targets. The windfarm lifetime is expected to significantly exceed that of the Oil & Gas assets and will continue to produce renewable electricity after those assets are decommissioned. The operational lifetime of the Project is assumed to be a minimum of 30 years.

4.2.1.3 The benefit of undertaking the Project in this way is to enable the electrification of oil & gas assets which otherwise may not be electrified for economic reasons while at the same time providing renewable energy to the grid via an offshore windfarm.

4.3 Site Overview

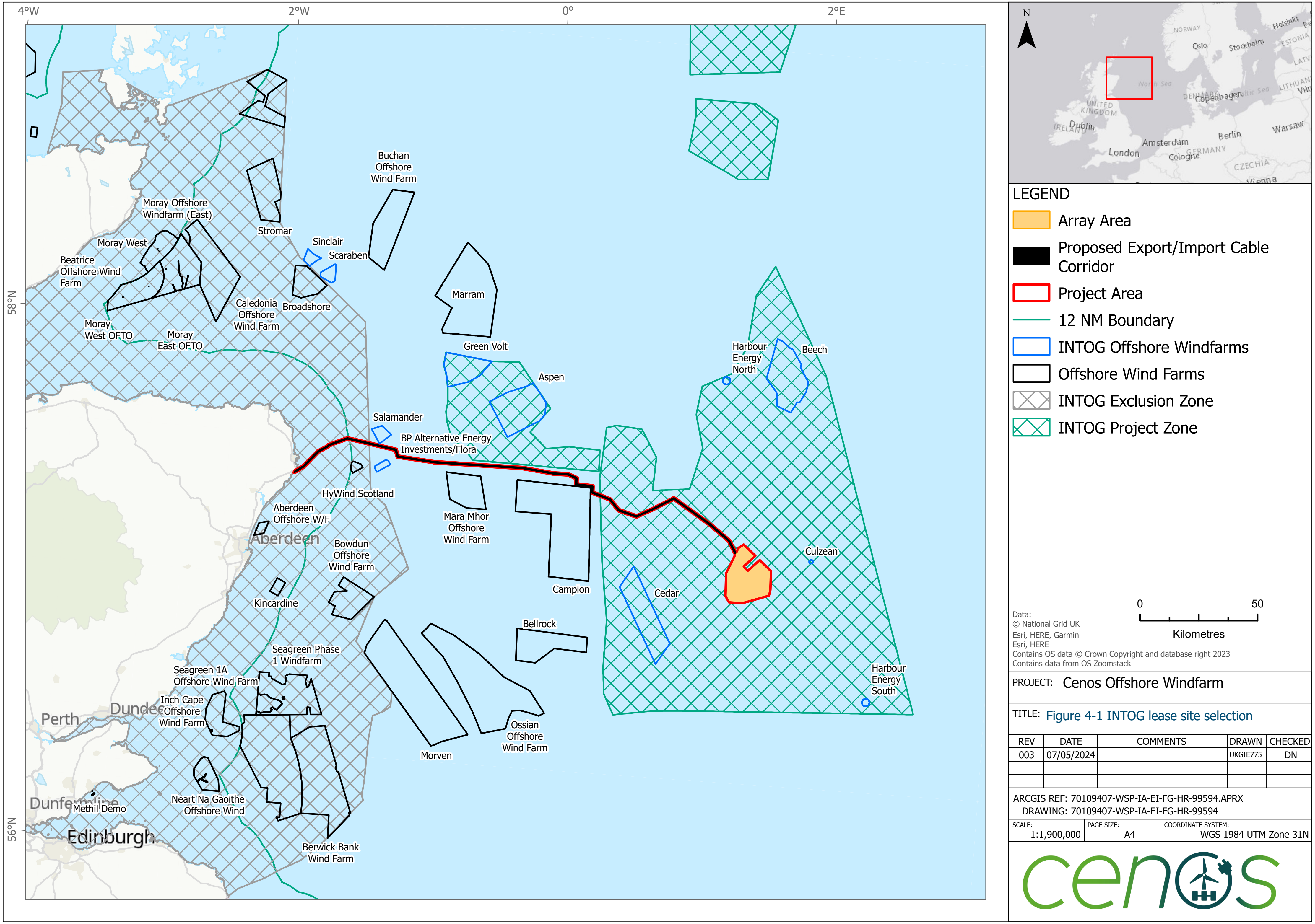
4.3.1.1 As shown in **Figure 4-1** the Project is located in the Central North Sea. The Array Area is located 185 km offshore east of Aberdeen. **Figure 4-1** shows the Project Area in the context of the INTOG Project Area and other offshore windfarms. **Figure** 4-2 shows broadly uniform water depths of approximately 90 - 100 m across the area; this exceeds the depth possible for fixed wind solutions but is suitable for floating wind.

4.3.1.2 The Floating Turbine Units (FTUs) will each have a WTG and a floating substructure and will be anchored to the seabed to maintain station-keeping within the Array Area.

4.3.1.3 Dynamic subsea AC power cables will provide electricity from the WTGs to the OSCP located within the Array Area. These cables are referred to as the inter-array cables.

4.3.1.4 The HVDC transmission assets include the onshore converter platform (OCP) and the OSCP. The OCP and OSCP are connected by the HVDC export/import cables. In the marine environment the export/import cables will be installed within the ECC. The proposed ECC route length extends approximately 230 km from the north western boundary of the Array Area and proceeds north westerly/westerly to landfall at Long Haven between the villages of Boddam and Longhaven on the Aberdeenshire Coast. From landfall at MHWS the transmission connection continues to an HVDC OCP located at the Four Fields site, and subsequent grid connection at the transmission system operator substation in Peterhead (hereafter referred to as “ongoing grid connection”).

4.3.1.5 Static subsea HVAC power cables will provide electricity from the OSCP to oil and gas assets located within the Onward Development Area.



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London
Cologne
GERMANY
CZECHIA
Vienna
Buchan Offshore Wind Farm
Moray Offshore Windfarm (East)
Stromar
Sinclair
Scaraben
Moray West
Beatrice Offshore Wind Farm
Caledonia Offshore Wind Farm
Broadshore
Marram
Moray West OFTO
Moray East OFTO
Green Volt
Aspen
Harbour Energy North
Beech
Salamander
BP Alternative Energy Investments/Flora
HyWind Scotland
Aberdeen Offshore W/F
Aberdeen
Mara Mhor Offshore Wind Farm
Bowdun Offshore Wind Farm
Campion
Culzean
Cedar
Kincardine
Bellrock
Seagreen Phase 1 Windfarm
Seagreen 1A Offshore Wind Farm
Inch Cape Offshore Wind Farm
Perth
Dundee
Ossian Offshore Wind Farm
Morven
Harbour Energy South
Neart Na Gaoithe Offshore Wind
Dunfermline
Methil Demo
Edinburgh
Berwick Bank Wind Farm
LEGEND
Array Area
Proposed Export/Import Cable Corridor
Project Area
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PROJECT: Cenos Offshore Windfarm
TITLE: Figure 4-1 INTOG lease site selection
REV | DATE | COMMENTS | DRAWN | CHECKED
003 | 07/05/2024 | | UKGIE775 | DN
ARCGIS REF: 70109407-WSP-IA-EI-FG-HR-99594.APRX
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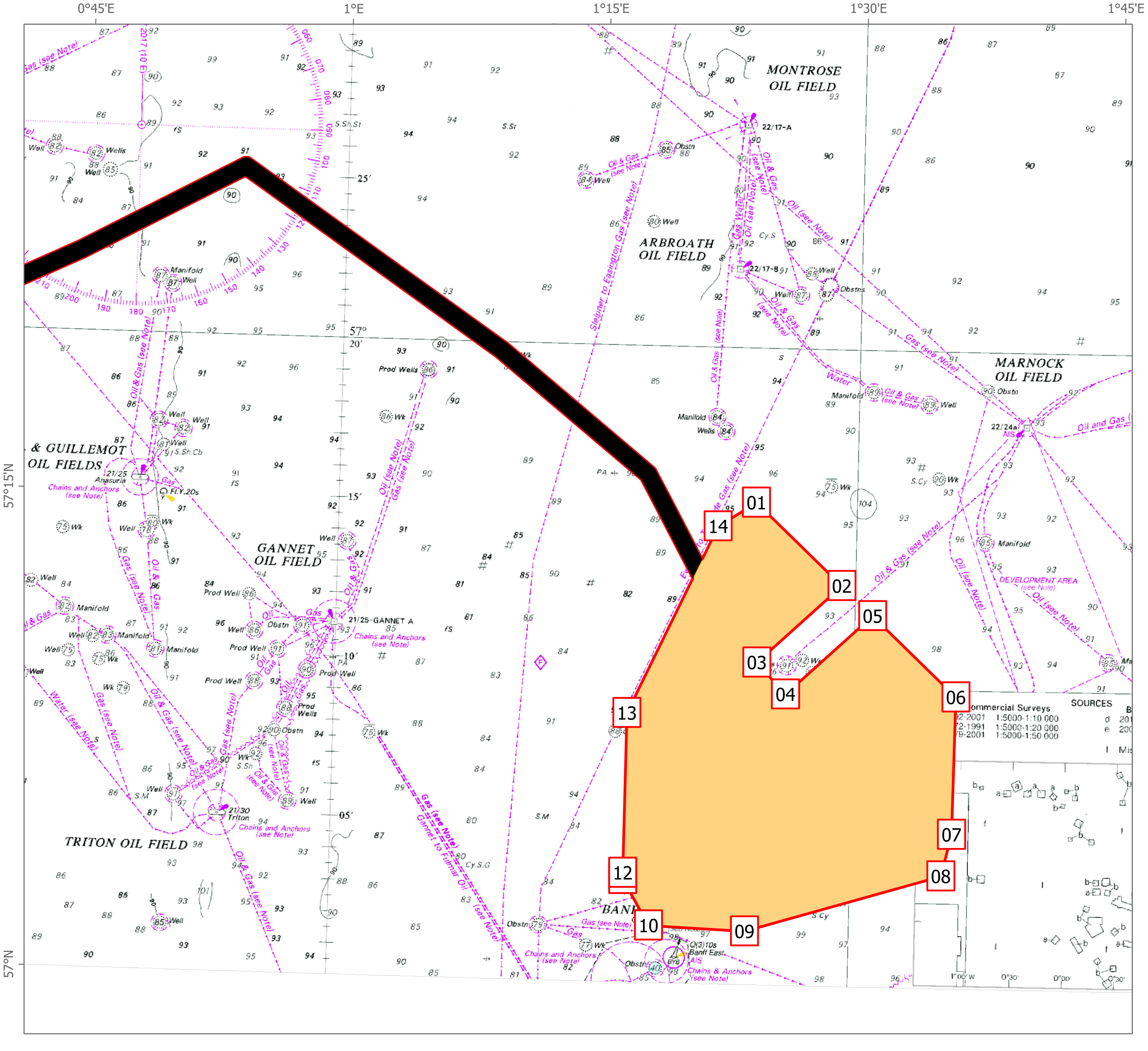

LEGEND

- Array Area
- Proposed Export/Import Cable Corridor
- Project Area
- Array Area Vertices

0 5
Kilometres

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PROJECT: Cenos Offshore Windfarm

TITLE: Figure 4-2 Cenos Offshore Array Area location including Site Boundary vertices and water depths

REV	DATE	COMMENTS	DRAWN	CHECKED
002	07/05/2024		UKGIE775	DN

ARCGIS REF: 70109407-WSP-IA-EI-FG-HR-47921.APRX
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4.4 Project Design Envelope Approach

4.4.1.1 The PDE approach, also known as the Rochdale Envelope approach, will be adopted for the assessment of the Project, in accordance with current good practice and with the latest Marine Directorate published guidance[43] and other guidance where appropriate. The PDE concept allows some flexibility in project design options, particularly for foundations and WTG type, where the full details are not known at the consenting stage.

4.4.1.2 The PDE will provide maximum and minimum parameters where appropriate to ensure that the realistic maximum design scenario (MDS) can be quantified and assessed in the EIAR and RIAA.

4.4.1.3 The MDS assessed for each topic, will be based on the design envelope detailed within this chapter. The relevant MDS will be identified and explained within the chapters in the EIAR.

4.4.1.4 The Project description, including the design envelope, is detailed in this section to provide an overview of proposed infrastructure. The design envelope presented in this report may be refined or amended further through engineering design development and consultation with relevant stakeholders. Any changes will be reported within the EIAR and RIAA.

4.5 Project Description

4.5.1 Overview

4.5.1.1 The Array Area encompasses approximately 333 km^2, within which the generation assets are located along with certain elements of the transmission assets (e.g. OSCP).

4.5.1.2 The generation assets include: the FTUs (inclusive of substructure, WTGs, moorings systems), and dynamic and static portions of the inter-array cables.

4.5.1.3 The transmission assets include: the OSCP and the offshore export/import cables. The OSCP will provide the connection point for the inter-array cables, bringing the power from the WTGs to the OSCP; the connection points for the transmission cables connecting the oil and gas assets to the OSCP; the connection point for the HVDC export/import cables; power transformers, HVDC converter and associated equipment including metering and control systems. The OSCP HVDC converter, converts HVAC to HVDC power and vice versa to allow export and import of power from shore.

4.5.1.4 There are two options being considered for OSCP design and configuration. Option number one shall be considered as the base case. The base case is to install a fully integrated HVDC OCSP that includes provision for all HVDC and HVAC equipment needed to connect the HVDC converters to the UK grid and HVAC equipment needed to connect both the WTGs and oil and gas assets to the OSCP. Option number two will be composed of a single fully integrated HVDC platform and one smaller HVAC platform which is adjacent, and bridge linked to the main platform, separating HVAC equipment onto one platform and the HVDC converter equipment onto another.

4.5.1.5 The ECC is approximately 230 km in length, it runs from the HVDC converter that will be located on the OSCP, located within the Array Area, to MHWS at the landfall location.

4.5.1.6 For the purposes of electrification, it is anticipated there will be several onward connections to oil and gas assets located in the waters to the north, west and southeast of the Array Area. These assets will be located within the Targeted Oil and Gas Onward Development Area (see **Figure 4-3**). These onward connections will be considered as part of the environmental assessment within the cumulative effects assessment (CEA) but will not form part of the

Project consent application. Marine licences for these cables will be applied for separately in the future.

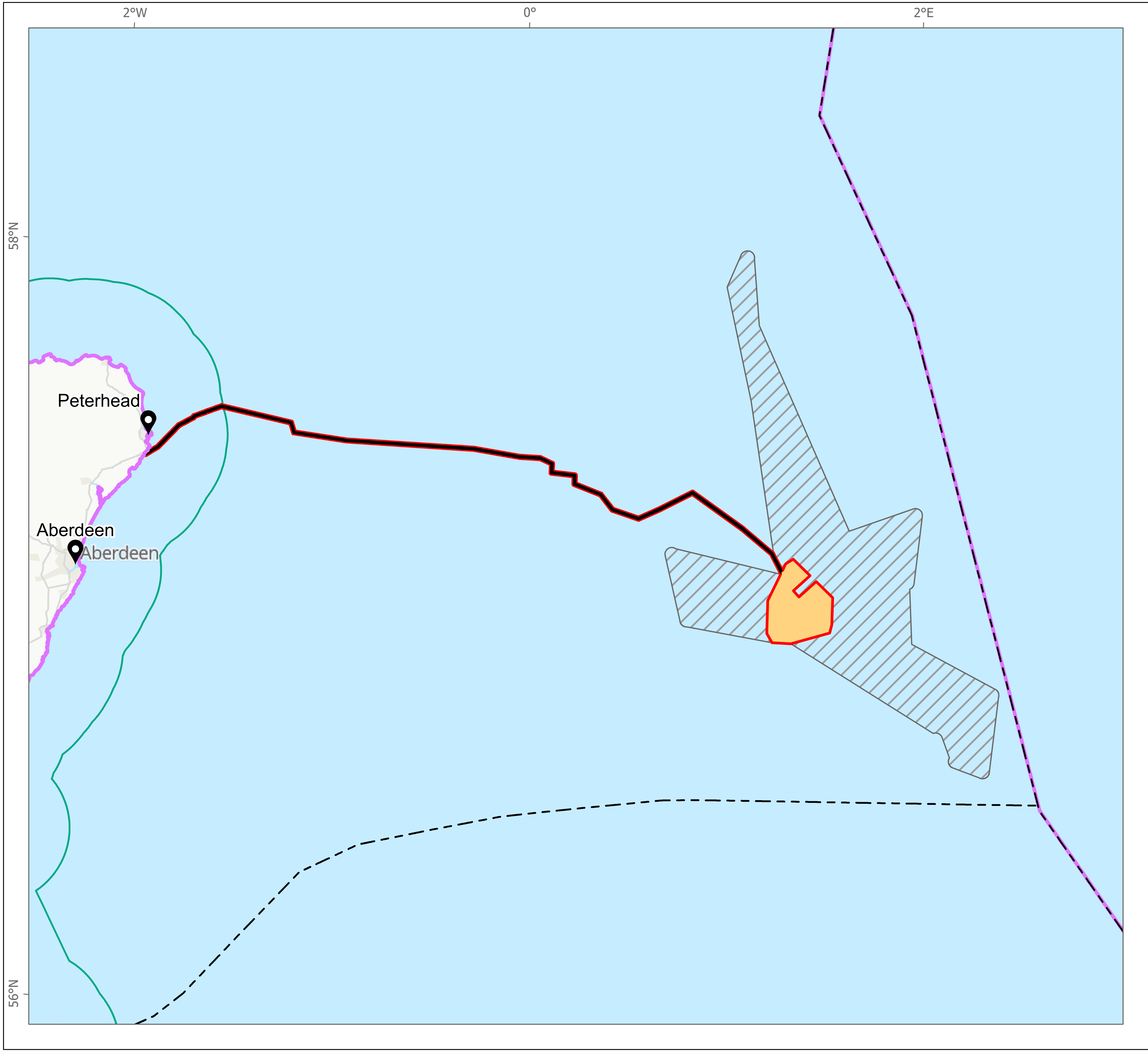
4.5.1.7 In the instance where the windfarm cannot provide enough power to oil and gas production assets due to prevailing wind conditions not providing enough energy to generate electricity, the oil and gas assets will draw direct from the UK grid via the Project infrastructure.

4.5.2 Array Area

4.5.2.1 The WTGs will be installed on floating substructures which are held in station by a mooring system (comprising mooring lines, anchors, connectors, and jewellery). There are several substructures and mooring system design options available that are currently under consideration. These are included within the design envelope and further details are provided in this section.

4.5.2.2 HVAC electricity generated by the WTGs, the power from each FTU will be exported via the inter-array cables to the OSCP which will be located on a bottom-fixed jacket platform.

4.5.2.3 Each component of the Array Area is described in more detail below.



LEGEND

- Array Area
- Proposed Export/Import Cable Corridor
- Project Area
- Onward Development Area
- EEZ Limit
- Scotland Adjacent Waters
- Major Port/Harbour
- 12 NM Boundary

0 50
Kilometres

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PROJECT: Cenos Offshore Windfarm

TITLE: Figure 4-3 Cenos Scoping Red Line Boundary and Targeted Oil and Gas (TOG) Onward Development Area

REV	DATE	COMMENTS	DRAWN	CHECKED
002	03/05/2024		UKGIE775	UKTMD003

ARCGIS REF: 70109407-WSP-IA-EI-FG-HR-34796.APRX
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Wind Turbine Generators (WTGs)

4.5.2.4 The WTG supplier has not been selected yet and specific WTG details cannot be provided at the time of writing. Furthermore, is it is assumed that WTG capacity will continue to increase over time, and WTGs larger than 15 MW are likely to be available by the time construction starts. Higher capacity WTGs are preferred as this reduces the number of WTGs required to meet the overall windfarm capacity.

4.5.2.5 **Table 4-1** provides the design envelope for the WTGs. The design envelope considers the maximum potential dimensions of a higher capacity WTG while also considering the maximum quantity of lower capacity (15 MW) WTGs required to achieve the maximum windfarm capacity.

Table 4-1: WTG design envelope

Design parameter	Design envelope
WTG Type	3-blade Horizontal Axis Wind Turbine (HAWT)
Minimum and maximum number of WTG	68 to 95
Minimum and maximum WTG hub height (to centre line of hub) (meters above lowest astronomical tide (LAT))	140 m to 180 m (above LAT)
Maximum WTG rotor diameter	Up to 280 m
Maximum blade tip height above LAT for Tension Leg Platform	Up to 320 m (above LAT)
Maximum blade tip height above LAT for Semi-Sub	Up to 310 m (above LAT)
Minimum Blade clearance – Lowest blade tip height above mean sea level (MSL)	22 m in operational conditions.
Maximum rotor swept area (based on 95 15 MW turbines with a maximum rotor diameter of 236 m)	4,369,626 m^2
Navigation and aviation lighting	As per regulatory authority requirements: **Navigation:** (marine lighting) – see **Table 4-2.** **Aviation:** Civil Aviation Authority (CAA) and Search and Rescue (SAR) requirements MGN645 Annex 5[44]: Perimeter WTGs should have a single red aviation hazard light on each nacelle, flashing Morse "W" in unison if the WTGs are more than 900 m apart. Other WTGs require a steady red aviation hazard light. Additionally, in winching areas, a low-intensity green status light indicates safe winching, and floodlighting is needed for night operations (if allowed). Consultation with the Ministry of Defence is required to understand military aviation requirements.

4.5.2.6 The final layout of the windfarm shall be determined post consent and will be influenced by environmental, technical, maritime, commercial and safety factors. Design considerations include:

- Seabed characteristics;
- Metocean characteristics;
- Avoiding existing oil and gas infrastructure left on the seabed following decommissioning;
- Avoiding existing subsea cabling;
- Geotechnical conditions and measured/modelled metocean conditions;
- Foundation type, and installation options;
- Constraints on the Array Area that will influence the overall layout as a result of surveys and consultations;
- Guidelines or requirements stemming from MGN 654; and
- Consideration of relevant stakeholders.

WTG Floating Substructures

4.5.2.7 A floating substructure will support each of the WTGs. A single WTG shall be mounted on each substructure. Floating substructures are a developing technology, and the Applicant is considering several designs which could be suitable (see **Plate 4-1**). The main types of floating substructure under consideration are semi-submersible and Tension Leg Platform (TLP) designs, and the primary material to be used for the floating substructure will be steel (as opposed to concrete which is not under consideration for the project).

4.5.2.8 Semi-submersible floating substructure designs are buoyancy stabilised with the stability provided by the semi-submerged buoyant columns (typically 3 or 4 columns) positioned around the periphery of the substructure and connected with trusses. The primary function of the mooring system for buoyancy stabilised designs is to maintain station-keeping of the FTU. There are several mooring system types under consideration for the semi-submersible floating substructure.

4.5.2.9 TLP designs are mooring stabilised, meaning that the stability of the FTU is provided by the tension in the mooring system. The floating substructure for a TLP is over-buoyant by design and would topple over without the stability provided by the tension in the mooring system. The mooring lines used in a TLP design are typically referred to as tendons. The substructure for a TLP design may also consist of buoyant columns and trusses but may instead consist of trusses arranged in a tetrahedral or star shape, depending on the specific design.

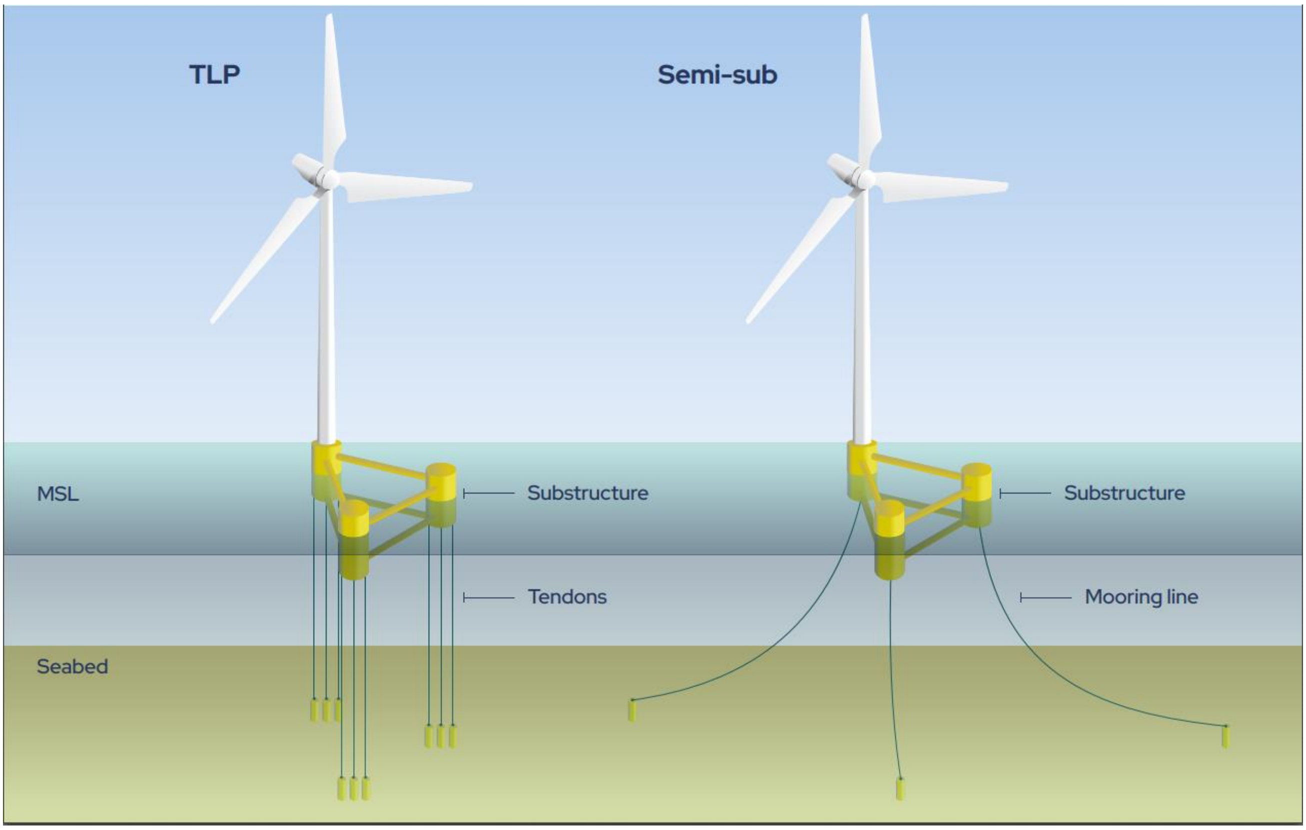
4.5.2.10 **Table 4-2** provides the design envelope for floating substructures.

Table 4-2: WTG floating substructures

Design parameter	Design envelope
Sub structure type	Buoyancy-stabilised type (e.g. semi-submersible); Mooring-stabilised type (e.g. TLP)
Elevation above waterline	Will depend on the design and overall height of the FTU selected
Geometry	Triangular, rectangular, or cylindrical
Primary material	Steel
Overall Length of platform (m)	Up to approximately 115 m

Design parameter	Design envelope
Overall Breadth of platform (m)	Up to approximately 100 m
Overall height (draft & freeboard) of platform (m)	Up to approximately 40 m
Maximum number of Mooring lines	Up to 9 mooring lines per platform
Colour	RAL1023 Traffic Yellow
Navigational lighting	All navigational aids will be installed in accordance with R0139 (O-139) guidelines.

Plate 4-1: Substructure types



Mooring Systems

4.5.2.11 Floating substructures are attached to the seabed via mooring systems. A mooring system includes mooring lines (steel chain, steel tubes, steel rope, or polymer rope or a combination of different types), anchors, associated connectors (to the substructure, to the anchors, or between distinct sections of mooring lines) and other items connected along the length of the mooring line (such as clump weights, buoyancy elements and load reduction devices (jewellery)). Example mooring system arrangements are shown in **Plate 4-3** and **Plate 4-4** for a semi-submersible floating substructure and shown in **Plate 4-5** for a TLP.

4.5.2.12 When selecting a substructure design, compatible mooring system designs will be a key consideration. The mooring system must be suitable to withstand the substructure design loads whilst ideally reducing the number and extent of mooring lines and anchor attachment points on the seabed.

Mooring Lines

4.5.2.13 The mooring line designs under consideration include:

- **Catenary**, a free hanging line, which forms a catenary curve, one end of the mooring line is connected to the FTU, and the other end is fixed at an anchor point on the seabed. This system can adapt to harsh marine environments. **Plate 4-2**, **Plate 4-3**, **Plate 4-6** shows its application on a semi-submersible substructure.
- **Taut moorings**, typically made of synthetic fibre rope which have a smaller mooring radius than catenary lines. The taut mooring line reaches the anchor at an angle to the seabed and therefore there is a vertical force component requiring an anchor with high vertical loading capacity. **Plate 4-2**, **Plate 4-4,** and **Plate 4-6** shows its application on a semi-submersible substructure.
- **Semi-taut moorings**, a hybrid of catenary and taut mooring lines that typically consists of a combination of steel chain, steel wire rope and/or synthetic rope sections, and typically has a mooring footprint smaller than catenary but greater than taut.
- **Tension moorings**, (for TLP substructures only) tendons typically made of steel tube or synthetic material run vertically (or near-vertically) from the substructure to the anchors directly below, but other options are being developed, as shown in **Plate 4-5**. The tension mooring system has a much smaller mooring radius than the other three mooring arrangements, as demonstrated in **Plate 4-2**, **Plate 4-6,** and **Plate 4-7**.

4.5.2.14 All four mooring system types will be considered during the design process. These have been included in the design envelope to ensure all potential options and alternatives are considered, when identifying the MDS.

Plate 4-2: Primary mooring system design concepts

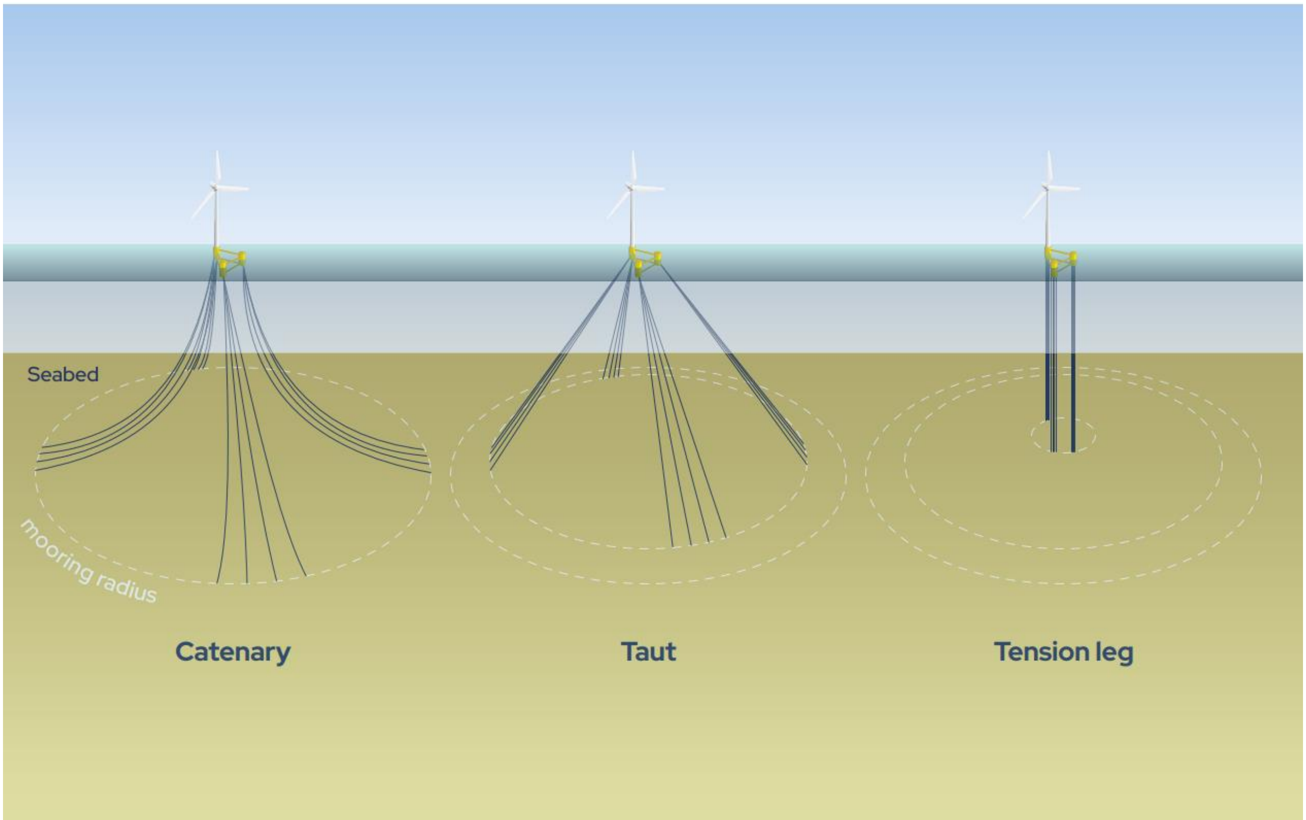


Plate 4-3: Semi-submersible with one of its catenary moorings

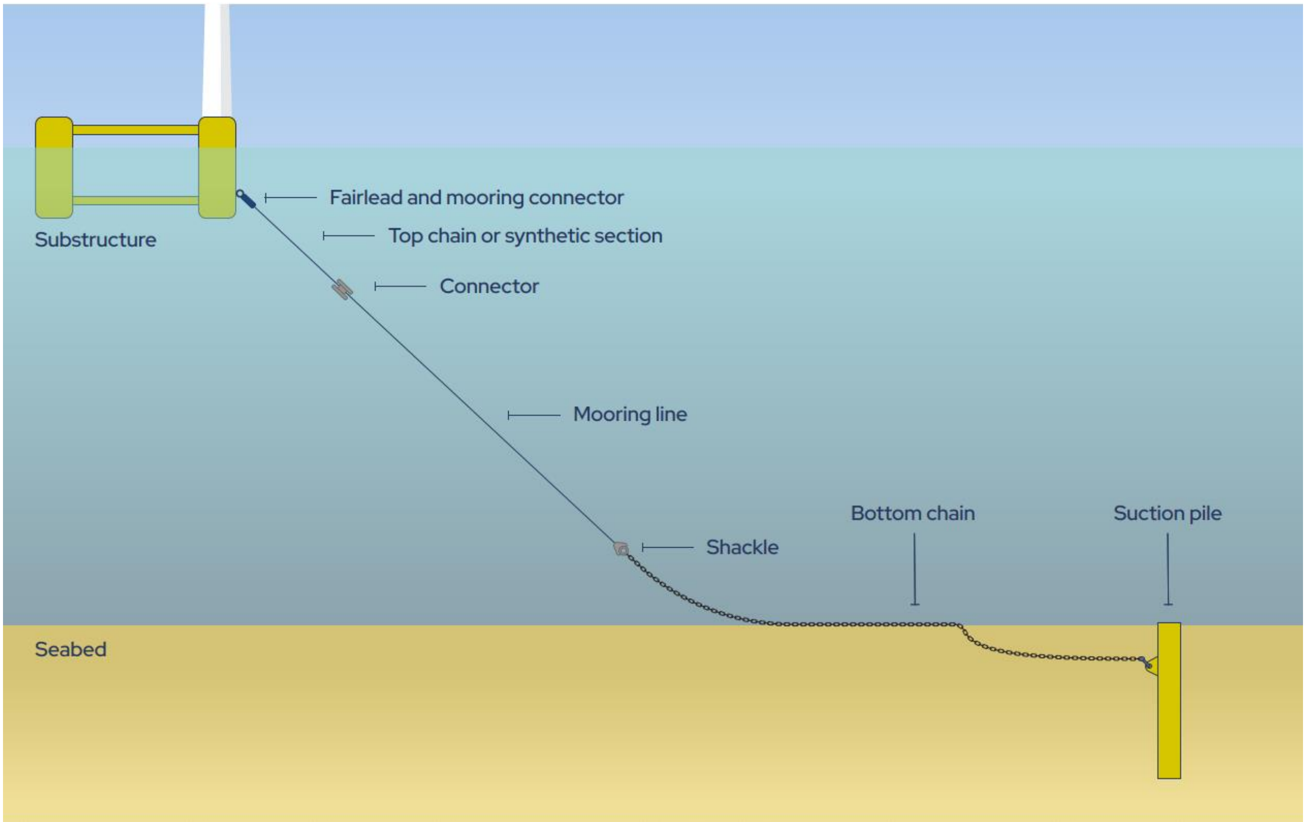


Plate 4-4: Semi-submersible with a taut mooring system

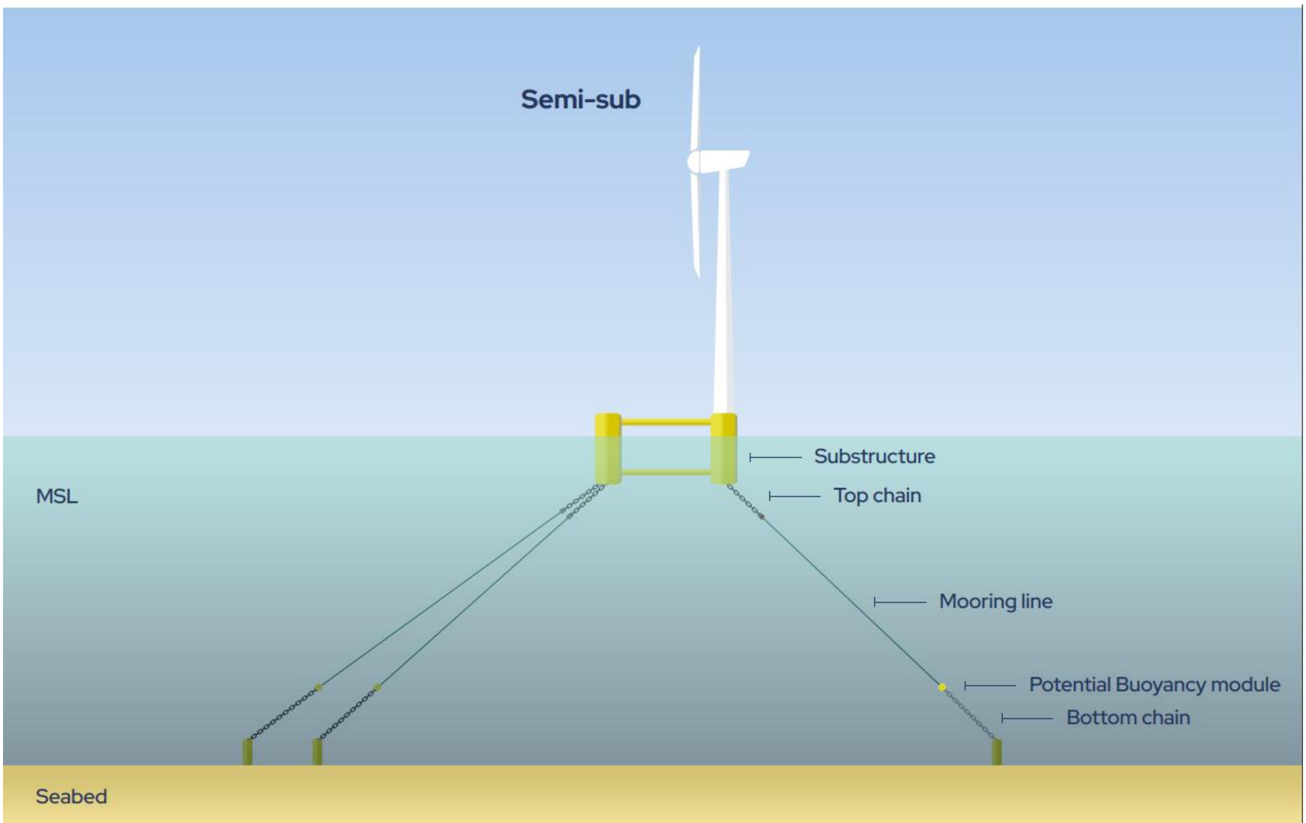


Plate 4-5: Tension mooring on a Tension-Leg Platform

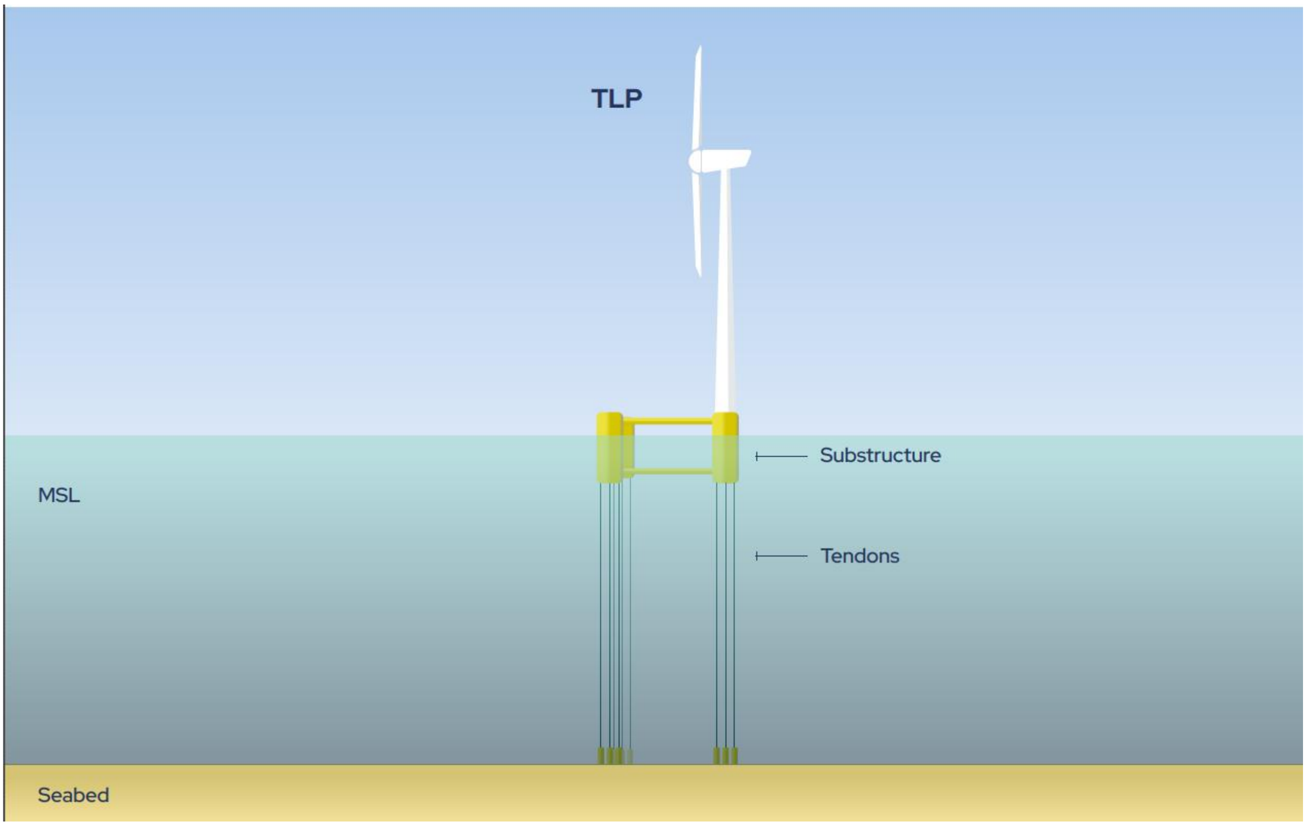


Plate 4-6: Semi-sub mooring spread

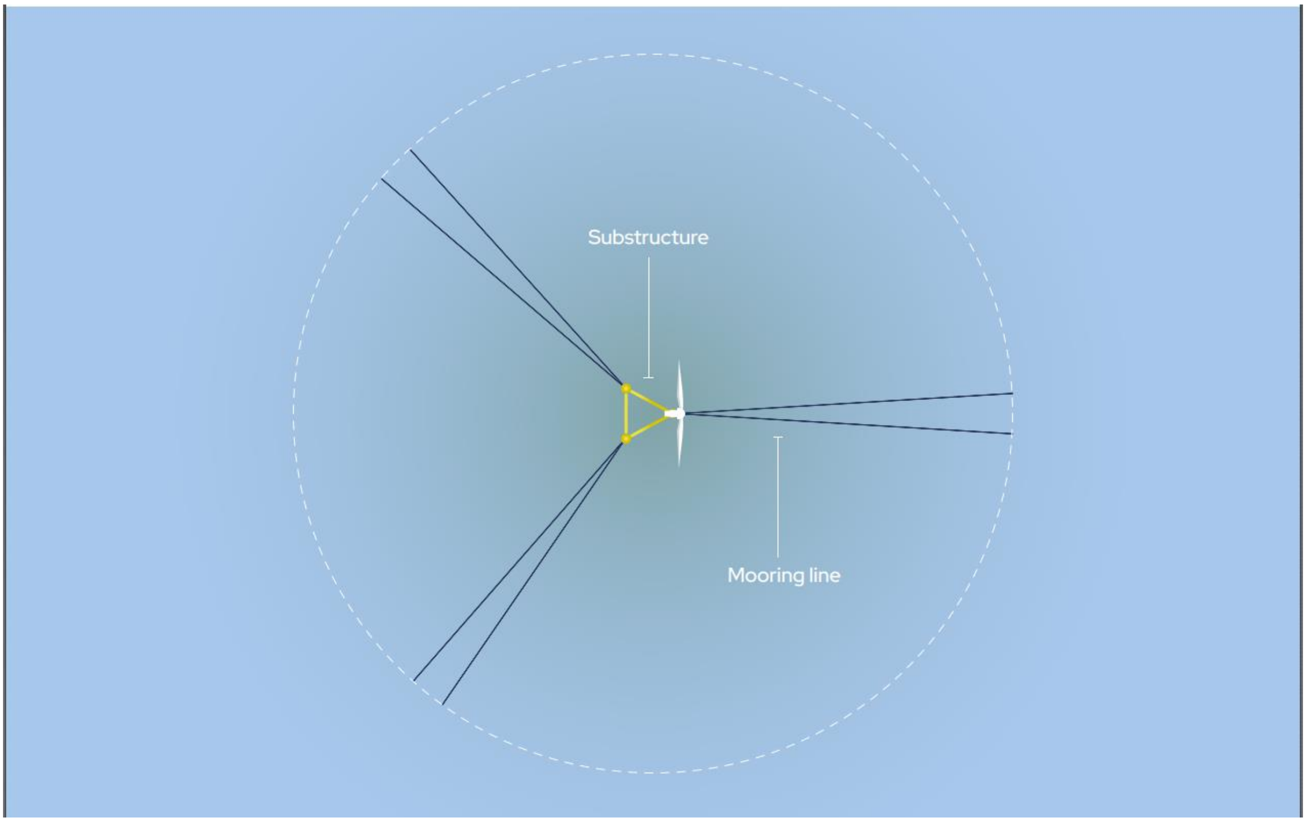
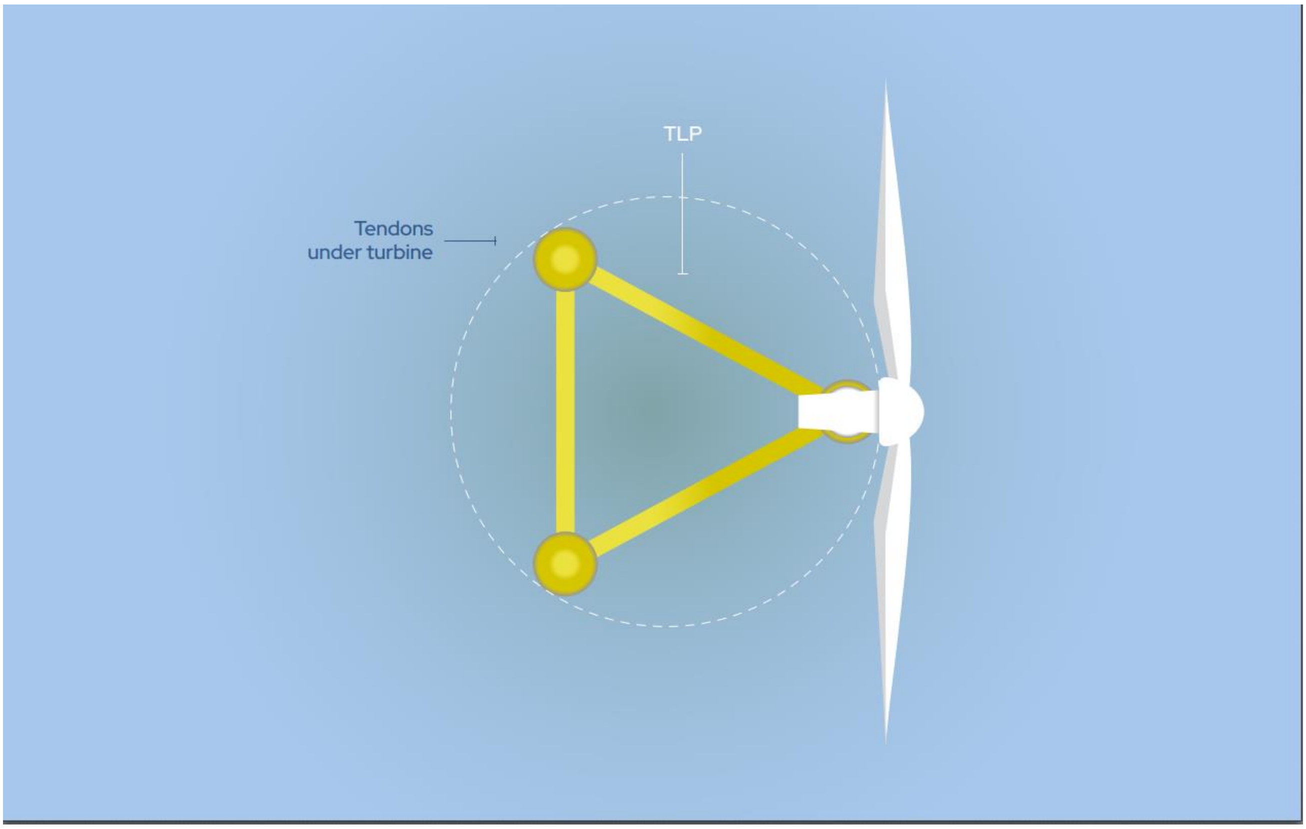


Plate 4-7: Tension-Leg Platform mooring spread



Anchor Types

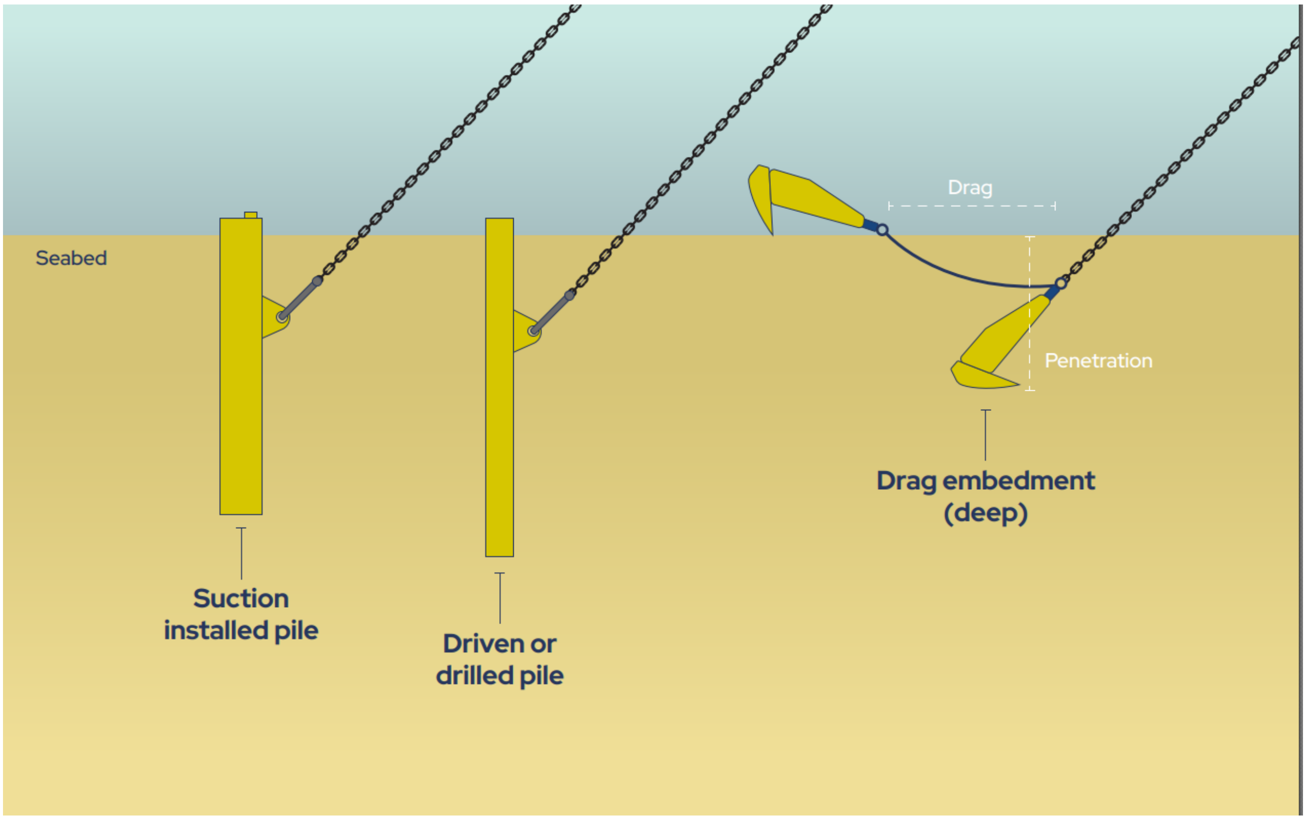
4.5.2.15 The anchor types being considered for the Project include:

- **Driven or drilled piles** are tubular piles which are small in diameter relative to their length. They achieve their holding capacity from the frictional force created during embedment. They are designed to withstand horizontal, vertical or multi-directional load, and are therefore suitable to use with a range of mooring line options. They can be used in a wide range of seabed conditions, including where there is hard ground that is less suitable for other anchor types. To install, they are lowered to the seabed and partially sink into the seabed under their own weight. They are then driven (or drilled) to their final embedment depth using an impact or vibro-hammer. Removal of driven or drilled piles is difficult, and therefore they may be left in field (see **Plate 4-8**).
- **Suction piles** are tubular piles with a top cap and controllable valve which are larger in diameter and shorter in length compared to driven or drilled piles. They achieve their holding capacity from the frictional force created during embedment. They are designed to withstand horizontal, vertical or multi-directional load, and are therefore suitable to use with a range of mooring line options. They require seabed conditions that are firm enough to hold suction but not so firm that penetration is impeded. To install, they are lowered to the seabed, open end first, and partially sink into the seabed under their own weight (with the valve open) to around 60 percent of their length. Final embedment is achieved by suction, the water trapped in the top of the pile is pumped out, lowering the rest of the pile into the seabed. To remove suction anchors during decommissioning, the installation processes is reversed. (see **Plate 4-8**).
- **Drag embedment anchors** are made from fabricated steel and are installed by dragging the anchor through the seabed until the anchor is fully embedded to a desired depth. The holding capacity is achieved through the resistance of the sediments in front of the

anchor. To install, the mooring line is pre-installed to the anchor and as the installation vessel drags the mooring line and anchor across the seabed, the anchor embeds further into seabed until the desired burial depth is achieved. They are designed to withstand horizontal loading only and are therefore only suitable to use on a limited range of mooring line types, mainly catenary and, in some cases, semi-taut. They are not suitable for vertical or multi-directional loading and are therefore not suitable for taut moorings or tendons (see **Plate 4-8**).

4.5.2.16 However, it should be noted at this stage that more novel anchor technology cannot be ruled out at this stage due to emerging technology development within the floating offshore wind sector.

Plate 4-8: Anchor concepts

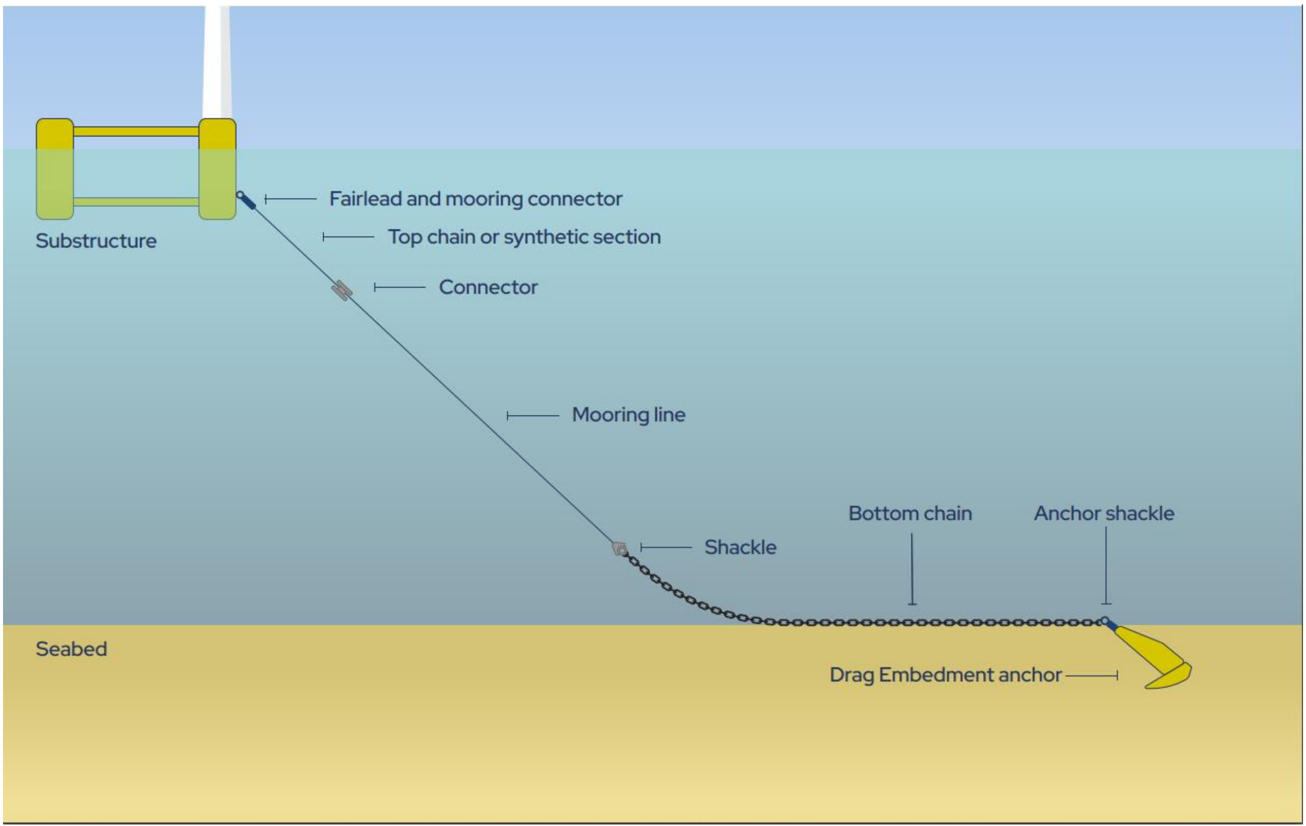


4.5.2.17 A typical elevation sketch of a single mooring line with a corresponding suction pile is shown in **Plate 4-3**. A typical elevation sketch of a single mooring line with a corresponding drag embedment anchor is shown in **Plate 4-9**.

4.5.2.18 The type and number of anchors and moorings required will be subject to refinement upon selection of the substructure and a review of loading conditions.

4.5.2.19 The location of the project in waters in excess of 90 m which are not subject to tidal currents or wave action limits the potential for seabed movement and scour around subsea infrastructure. Therefore, the risk of sediment scour around the anchors for the FTUs is anticipated to be low and scour protection is unlikely to be required.

Plate 4-9: Mooring components with drag embedment anchor



4.5.2.20 **Table 4-3** provides the design envelope for the mooring and anchor system.

Table 4-3: Mooring and anchor design envelope

Design parameter	Design envelope
Number of mooring lines per WTG	Up to 9
Mooring types	Catenary, Taut or Semi-Taut, and Tension Leg
Anchor types	Driven piles, Suction piles or Drag embedment
Pennant wires/buoys	If anchors installed ahead of mooring system, then temporary submerged buoy may be used to indicate anchor position for Remotely Operated Vehicles (ROVs) for mooring hook-up. Surface buoys are not anticipated.
Mooring line radius (m)	Up to approximately 850 m
Mooring line materials	Steel chain/Steel wire rope/Synthetic fibre rope/steel tubes
Anchors	Up to 9

Inter-Array Cables

4.5.2.21 Inter-array cables are required to allow power to be supplied to WTGs during start-up, for power generated by the WTGs to be exported, and to facilitate communications to allow WTG operations to be monitored and controlled.

4.5.2.22 Typically, an offshore windfarm is organised in a “hub-and-spoke” arrangement with the OSCP as the central point within the Array Area. From this point, strings of three to six WTGs extend radially like spokes on a wheel. The inter-array cables channel energy toward the OSCP. The precise arrangement for the Project is subject to turbine size and electrical design.

4.5.2.23 The final arrangement of the FTUs and inter-array cables is determined through detailed analysis which includes consideration for WTG yield, inter-array cable length, avoiding seabed constraints and other site constraints such as compliance with MGN 645 and its annexes[45] where applicable. A consideration particular to floating wind of the inter-array cabling is to provide redundancy, in the case of cable failure or breakdown. Further studies will be undertaken post consent and during detailed design to optimise the cable array as the FTU system is developed.

4.5.2.24 For floating wind, the inter-array cable will be composed of ‘dynamic’ and ‘static’ sections. Dynamic inter-array cables have additional armour layers inside the cable to provide protection against loading regimes induced by the FTU dynamic motion.

4.5.2.25 The dynamic inter-array cable configuration comprises the section of cable in the water column between the FTU and the seabed touchdown, and includes ancillaries such as buoyancy modules, bend stiffeners, hold-back tethers, and other forms of cable protection. A typical dynamic cable configuration uses buoyancy modules to form a ‘lazy-wave' shape to reduce hang-off load and to decouple the FTU dynamic motion from the static section of the cable on the seabed, resulting in less movement and interaction between the cable at the touchdown and burial location. During the design process, the dynamic cable configuration will be optimised in conjunction with the design of the floating substructure and mooring system.

4.5.2.26 The static portions of the inter-array cables are on the seabed from touchdown to the OSCP, the depth of burial (DoB) required to ensure cables are protected will be determined by a Cable Burial Risk Assessment (CBRA) during detailed design. The preference is to bury cables wherever practicable, but rock protection may be required for asset crossings and where DoB cannot be achieved. **Table 4-4** provides a summary of the expected design envelope for the inter-array cables.

Table 4-4: Inter-array cables design envelope

Design parameters	Design envelope
Maximum potential length of inter-array cables	Approximately 330 km (inter-array cables only)
Cable outer diameter	Up to 500 mm diameter
Number of WTGs per inter-array cable string	between 3 and 6, subject to design
Rated capacity	66 kV or 132 kV for HVAC
Installation methodology for static sections on seabed	Trenching, dredging, jetting, ploughing, controlled/mass flow excavation, rock cutting, backfilling or other burial technique.
Indicative Maximum burial depth (m)	2 m (target burial depth no more than 1.5 m)
Indicative Minimum burial depth (m)	0.5 m if buried (0 m if protection system required)

Design parameters	Design envelope
Indicative maximum trench width	2 m
Non-Buried Installation Technique	Rock placement, concrete mattresses, CPS, Gabions, Uraduct, Cast Iron shells. Remedial rock protection/mattresses will likely need to be deployed where minimum cable depth burial is not achieved.
Existing cables/pipeline crossing protection	Rock placement and/or mattresses

Offshore Substation and Converter Platform (OSCP)

4.5.2.27 The OSCP base case is expected to be a single integrated platform incorporating both HVAC and HVDC equipment needed to connect the HVDC equipment to the UK grid and HVAC equipment needed to connect both the WTGs and the oil and gas assets to the OSCP.

4.5.2.28 Where these cannot be integrated two adjacent bridge-linked platforms may be required, these two platforms will jointly act as the electrical hub for the Project:

- One smaller HVAC OSCP will transfer power from the WTGs via dedicated static subsea HVAC power cables, to the oil and gas assets (that is platforms, FPSOs and other production facilities) located within the Onward Development Area (see Section 4.5.4). This smaller platform will be connected via a bridge link to the larger HVDC OSCP, the two platforms will be connected via HVAC interconnecting cabling; and
- One larger HVDC OSCP will convert energy generated by the WTGs from HVAC to HVDC to allow power to be efficiently exported via the export/import cable from the HVDC OSCP to MHWS for ongoing grid connection. When there is insufficient power from the WTGs to supply all the power needed for the oil and gas assets demand the HVDC system will act as a power from shore system, and power will be imported from the UK Grid where it is converted within the HVDC converters from HVAC to HVDC at the OCP and then back to HVAC at the OSCP for onward transmission to the oil and gas assets.

4.5.2.29 Both the HVAC and HVDC OSCPs will be fixed jacket structures which will require small scale pin piles (circa 3.5 m diameter) to secure the jacket to the seafloor.

4.5.2.30 **Table 4-5** and **Table 4-6** present the expected HVDC OSCP and HVAC OSCP parameters under consideration where these cannot be integrated and are separate platforms, which will likely be bridge linked. It is anticipated that the HVAC OSCP dimensions will be smaller than the HVDC OSCP, this is to still be refined and further details will be included within the EIAR.

Table 4-5: HVDC OSCP design envelope

Design parameters	Design envelope
Maximum topside dimensions based on largest 1350 MW topside design (LxWxH) (m)	Up to 75 m (Length) Up to 40 m (Width) Up to 35 m (Height)
Structure type and method of fixing	Jacket with driven piles, drilled or suction bucket piles.
Topside weight (tonnes)	Approximately 12,500 tonnes
Jacket Weight (tonnes)	Approximately 10,000 tonnes
Pin piles (number)	Up to 12
Pin pile diameter	Up to 3.5 m
Maximum hammer energy (kJ)	Up to 4,400 KJ

Table 4-6: HVAC OSCP platform design envelope

Design parameters	Design envelope
Maximum topside dimensions based on largest 1350 MW topside design (LxWxH) (m)	Up to 75 m (Length) Up to 40 m (Width) Up to 35 m (Height)
Structure type and method of fixing	Jacket with driven piles, drilled or suction bucket piles.
Topside weight (tonnes)	Approximately 4,000 tonnes
Jacket Weight (tonnes)	Approximately 3,200 tonnes
Pin piles (number)	Up to 8
Pin pile diameter	Up to 3.5 m
Maximum hammer energy (kJ)	Up to 4,400 KJ

4.5.3 Offshore Export/Import Cable

4.5.3.1 The offshore export/import cable will be approximately 230 km in length and will be sited within a 1 km wide cable corridor (the Export/Import Cable Corridor, referred to as the ECC). The HVDC export/import cable will carry power from the HVDC component of the OSCP, located within the Array Area, landward to MHWS, as seen in **Figure 1-1**.

4.5.3.2 The HVDC cables will be bi-directional, enabling the transmission of electrical power from the UK grid to the HVDC OSCP.

4.5.3.3 There will be two HVDC cables laid in up to two trenches (either bundled and laid in one trench or laid separately in two trenches). The fibre-optic cable will be laid in the same trench as one of the HVDC cables (or with both HVDC cables if they are bundled in the same trench).

4.5.3.4 The export/import cables are to be laid on the seabed, within the ECC as part of an engineered cable routing design, from MHWS to the touchdown to the OSCP. The DoB required to ensure cables are protected will be determined by a Cable Burial Risk Assessment (CBRA) during detailed design. The preference is to bury cables wherever practicable, but rock protection may be required for asset crossings and where DoB cannot be achieved.

4.5.3.5 The Applicant is coordinating with NorthConnect Limited regarding the inshore portion of the ECC (the 28 km section of cable from the 12 NM territorial boundary to MHWS). The ECC will be assessed from the Array Area to MHWS. The section of the ECC from MHWS to 12

NM is the same as the NorthConnect Cable Corridor. NorthConnect Interconnector and the Project will only require one set of infrastructure, within the overlapping marine licence Project Area from 12 NM to MHWS.

4.5.3.6 The section of the ECC from MHWS to 12 NM has previously been assessed within the EIAR submitted for NorthConnect Limited[46] and judged acceptable through the consenting of NorthConnect. The previous EIA work for NorthConnect will be considered in assessing the ECC from MHWS to 12 NM, updated by contemporary data and additional surveys undertaken.

4.5.3.7 **Table 4-7** presents the expected ECC parameters under consideration.

Table 4-7: Offshore export/import cable design envelope

Design parameters	Design envelope
Number of cables	Up to 3 (two HVDC and one fibre optic)
Length of each individual cable (km)	Approximately 230 km (from HVDC OSCP to landfall)
Trench Width per cable (m)	Approximately 2 m (in up to 2 trenches)
Target burial depth (m)	Approximately 0.5 m to 1.5 m
Cable protection if Depth of Burial not achieved	Concrete mattresses, rock placement, grout bags, cement bags, sandbags, uraducts, articulated pipes, cast iron shells, bend restrictors, filter units/gabion bags (rock bags).
Rated capacity (kV)	320 or 525 kV HVDC (export cables)
Installation method offshore	Pre-Lay Trenching, Simultaneous Lay and Burial, Post-lay Burial

4.5.4 Targeted Oil and Gas Onward Development

4.5.4.1 It is anticipated that static subsea HVAC power cables will provide HVAC power, and communications, from the OSCP to the prospective oil and gas assets targeted for electrification which are located within the Onward Development Area. See **Figure 4-3**.

4.5.4.2 Marine licences for these cables will be applied for separately in the future. The indicative parameters given in **Table 4-8** will be used for the in-combination assessment (see Section 1.1.2 for further details).

Table 4-8: Oil and gas cable design envelope

Design parameter	Design envelope
Number	Up to 10
Length (m)	Various cable lengths: 20 km, 31 km, 35 km, 37 km, 75 km, 115 km (Additional cable lengths between the max and min, to be allowed for reflecting maximum realistic distance from the asset)
Max cable outer diameter (mm)	300 mm
Rated capacity (kV)	66 kV
Components	Three phase HVAC and Fibre Optic (co-axial with power cable)

4.5.5 Landfall

4.5.5.1 The onshore aspects for ongoing grid connection (above MHWS), including the landward exit point and cable pull through, have already been consented through the NorthConnect HVDC Cable Planning Consent (Planning Application Reference Number APP/2015/1121 and APP/2018/1831). Therefore, these will not be assessed as part of the Project.

4.5.5.2 NorthConnect Limited has separately submitted applications for the ongoing grid connection and approval has been granted by Aberdeenshire Council and Marine Directorate:

- An EIAR and separate planning and marine licence application (06771 & 06870) was submitted for the HVDC buried cabling from the edge of the UK Exclusive Economic Zone to the OCP at Fourfields located near Peterhead, Aberdeenshire. Planning approval was granted in February 2019 by Aberdeenshire Council, and MD-LOT licences were issued in February 2019.
- An Environmental Statement (ES) and separate planning application (APP/2015/1121) was submitted for the onshore HVAC cable burial from Peterhead Substations to the UK Converter Stations and the construction of an OCP at Fourfields located near Peterhead, Aberdeenshire. Planning approval was granted in September 2015 by Aberdeenshire Council.

4.5.5.3 The cable installation at landfall will be via Horizontal Directional Drilling (HDD) and the exit point in the marine area is in water in excess of 25 m deep and approximately 190 m offshore. The HDD activity and punch out of three separate boreholes and its impacts on the marine environment will be assessed as part of this application (see Section 1.1.3 for further details).

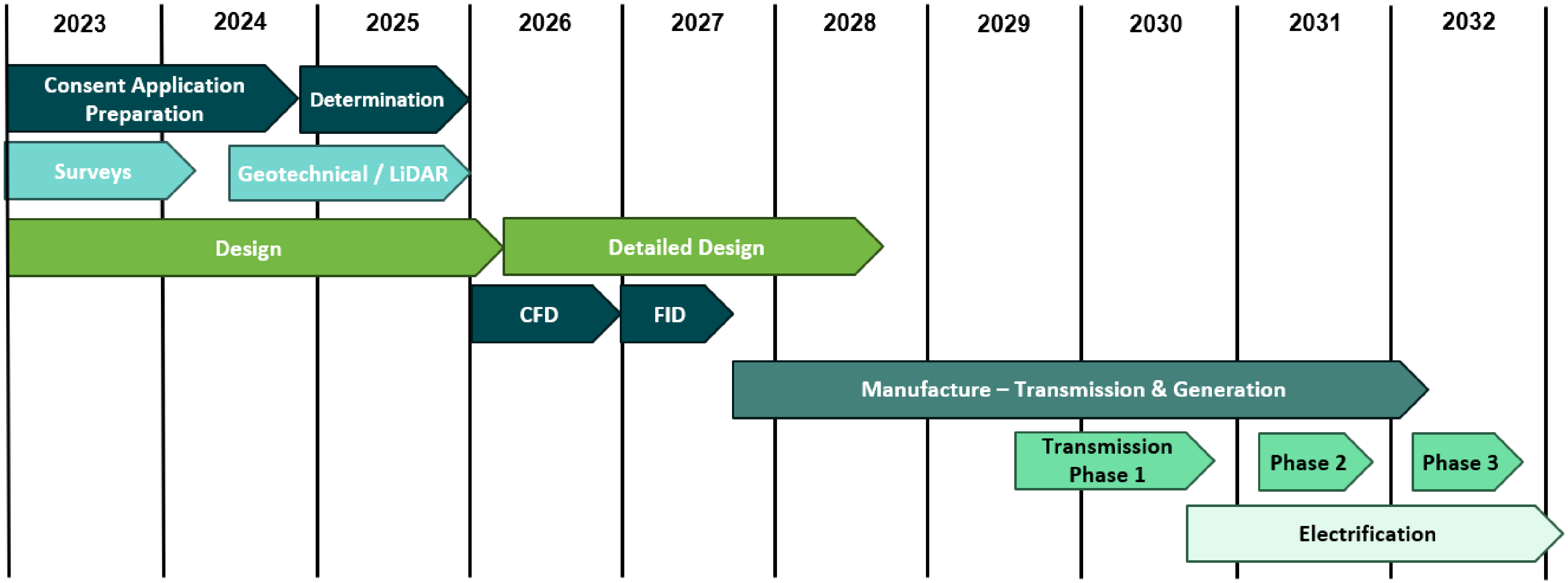
4.6 Indicative Project Timelines

4.6.1.1 The overarching aim of Project is to facilitate decarbonisation of the oil and gas industry through the electrification of offshore oil and gas installations, whilst also providing surplus renewable power to the UK grid. The timeline for the completion of this development project is summarised as follows and illustrated in **Plate 4-10**:

- 2024 Scoping Report[13] – submitted April 2024;

- Offshore consents applications (s.36, offshore and inshore marine licences) – submission Q4 2024;
- Offshore consents awarded – anticipated Q4 2025;
- Contract for Difference (CfD) – application and award 2026;
- Final Investment Decision (FID) 2027;
- Manufacturing of all generation and transmission components – 2027 to 2032;
- Offshore construction – 2029 to 2033
- Transmission: OSCP and Export Cables installed between 2029 and 2030;
- Generation: windfarm constructed over 3 seasons between 2030 and 2033;
- First power (will prioritise oil & gas customers – transmission phase 1) – 2030; and
- Windfarm completion – 2033.

Plate 4-10: Indicative Project timeline



4.7 Construction, Operations & Maintenance (O&M), and Decommissioning Works

4.7.1 Construction

4.7.1.1 The following sections outline the offshore construction schedules based on what is known at this stage of the Project.

4.7.1.2 The likely maximum duration of the offshore construction phase of the Project is up to five years. The three elements requiring installation are the:

- HVDC and HVAC OSCPs;
- FTUs including the mooring systems, substructure, and WTGs; and
- Cables including the:
  - Inter-array cables between FTUs and the HVDC and HVAC OSCP; and
  - DC export/import cable from the HVDC OSCP, located within the Array Area to MHWS (including the full extent of the ECC).

4.7.1.3 Five years is premised on installation of the OSCP in year one with three subsequent years of FTU and array cable installation with a year of potential overrun. Potential overrun cannot be discounted at this stage given scale of the project and nascency of the technology.

4.7.1.4 The OSCP and Export/Import Cable are expected to be installed and commissioned prior to installation of FTU's in order to provide power to FTU's for commissioning. Prior to installation or any infrastructure, pre-construction surveys and activities (including UXO inspection (and any required clearance), geophysical and geotechnical surveys and seabed preparations will be undertaken.

4.7.1.5 A construction and marshalling and Operations and Maintenance port(s) has not yet been identified for the Project and may not be known prior to finalisation of the EIAR and is subject to commercial agreement. The Applicant is however committed to the development of Scotland and as such, for the purpose of the EIA, it is proposed to assume that both the construction and marshalling and operation and maintenance ports are located on the East Coast of Scotland.

4.7.1.6 The wet storage of turbines outside of the Array Area in close proximity to a port is linked to a decision on construction and marshalling port(s) and as such potential impacts associated with wet storage are proposed to be scoped out of this assessment.

Floating Turbine Unit (FTU)

4.7.1.7 The mooring systems will be pre-laid and stored temporarily on the seabed. The FTU is expected in the base case to be towed to the Project Area from a suitable construction port. Alternately an FTU may be brought to the Array Area by heavy lift vessel for installation.

4.7.1.8 The pre-installation of the mooring system allows the FTU to arrive and be rapidly installed on location using the pre-installed mooring system. The installation method is specific to the anchor type chosen.

4.7.1.9 Substructures and WTGs are typically fabricated separately, potentially at different locations. The WTGs are typically installed onto the substructures at a port and, after pre-commissioning checks, the fully assembled unit is towed out to the Array Area and hooked up to pre-laid moorings.

4.7.1.10 Alternatively, with advancement of major offshore construction technologies, the floating substructure (without WTG) may be towed out to the Array Area and hooked up to the mooring system before the WTGs are installed onto the floating substructure on Site by means of a heavy lift vessel or other offshore crane solution.

4.7.1.11 The FTU will be connected to the inter-array cables as soon as practicable to allow them to be fully checked and commissioned prior to operation.

Offshore Substation and Converter Platform (OSCP)

4.7.1.12 The OSCP jacket will be loaded in harbour onto a vessel or barge and taken to the Array Area. It will be launched or lifted from the vessel and placed into position by a crane. Mudmats may be required to stabilise the structure on the seabed prior to pile installation. Piles (driven, drilled, or suction) will then be installed to hold it in place. The specifics of the piles will be determined during detailed design once the local geology has been confirmed.

4.7.1.13 Once the jacket is piled into position the topside will be delivered by vessel and lifted by cranes onto the jacket and secured into position to allow it to be commissioned. Once in place, cable connections can be made to bring the systems online.

Cable Installation

4.7.1.14 Inter-array cables can be laid before or after the installation of the FTUs. Post-laid inter-array cables, which are laid and connected after the FTU installation, are on the critical installation path. Pre-laid inter-array cables are laid prior to FTU installation and are then retrieved and connected once the FTU is installed. Pre-laying inter-array cables removes the cable lay activity from the critical installation path but requires wet storage of the dynamic section of the inter-array cable on the seabed or in the water column. Remotely operated vehicles (ROV) and cranes will be used to connect the inter-array cables to the FTU.

4.7.1.15 ECC and inter-array cables will be laid by a suitable cable installation vessel. They will be transported to site in either carousels or reels. The specific methodology for cable laying of the ECC and inter-array cables will be determined during the design process.

4.7.1.16 Various cable lay and burial techniques are available, their suitability is being determined in relation to the substrates present and depth of burial required. The specific technique to be proposed will be determined during detailed design, the options available include:

- **Pre-lay trenching (with and without active back fill) –** using a plough to create a trench for the cable to be placed into. It can then be left to naturally back fill, or the plough can be used to push material back into the trench.
- **Post-lay jet trenching –** where the seabed under the cable is fluidised to allow the cable to sink into the seabed.
- **Cable Protection -** Where cables cannot be sufficiently buried due to hard substrate(s) or where there are crossings over existing infrastructure (pipelines, cables), protective cover will be placed on top of the cables (e.g. rock berm, concrete mattresses, etc.). Where this is necessary, concrete mattresses are considered preferential to rock dumping as the mattresses are lower impact and are more easily removeable.

Horizontal Directional Drilling (HDD)

4.7.1.17 As the cable makes landfall at a sea cliff, HDD will be utilised for the landfall. The intent is to drill three holes one for each of the HVDC cables, and one for the fibreoptic cable. All three will be drilled to a diameter suitable for HVDC cables to provide a level of redundancy. The

HDD will be drilled from a point approximately 100-120 m inland from the cliffs, popping out approximately 190 m offshore, where water depths are in excess of 25 m.

4.7.1.18 HDD installation will include the drilling of pilot holes, drilling will stop prior to reaching the seabed surface, holes will then be reamed to achieve the appropriate diameter. The drilling utilises drilling fluids the primary purpose of which is to create a thick gel to suspend soil and rock cuttings and carry them out of the hole. Drilling fluids are treated and recycled onshore. Despite the drilling muds being non-toxic, prior to the hole being extended to the seabed, excess drilling fluid is removed to minimise losses of the muds to sea at the point of pop out.

4.7.1.19 Ducts are pushed into the holes from land and temporary protection placed over the seaward end, awaiting cable installation. Once ready to install the cables, preparations will be made including installation of a bellmouth on the seaward end of each duct. The cables will be pulled from the cable lay vessel through the ducts to shore. Once the cables are in place a cap will be installed to isolate the duct from the sea, protection will then be placed to protect the HDD marine exit point. Bentonite is pumped into the landward end of the duct to fix the cable in place in the duct.

4.7.1.20 The HDD works and cable pull will be timed as per the NorthConnect proposals laid out in Chapter 17 of their EIAR[46], in support of Marine Licence 06771[47], to specifically avoid disturbance of breeding birds.

4.7.1.21 Onshore HDD works in preparation for the cable installation will be completed between September and March to avoid the breeding bird season. Installation of the cable through the HDD from offshore to onshore (cable pull), will be carried out in March/April or Aug/Sept at the start/end of the breeding bird season to minimise disturbance. Offshore cable installation will be carried out between April and September.

4.7.1.22 Full details of HDD and cable pull are included in the NorthConnect HVDC Cable Infrastructure UK Construction Method Statement[48].

4.7.2 Operations & Maintenance (O&M)

4.7.2.1 Once operational, the Project will supply power to oil and gas assets and to the national grid (see Section 4.5.4). The Project will be managed, monitored, and operated from an onshore facility which will have remote access to the OSCP and individual FTUs, such that it can control which WTG is operational and monitor their efficiency.

4.7.2.2 During the operational period, scheduled and unscheduled monitoring and maintenance of offshore infrastructure will be required. During the project life, it is likely that some refurbishment or replacement of offshore infrastructure will be required. All offshore infrastructure, including WTGs, floating substructures and mooring systems, cables and fixed-bottom OSCP(s) will be included in monitoring and maintenance programmes.

4.7.2.3 Maintenance can be generally separated into three categories:

- **Planned maintenance:** Servicing of components in line with the maintenance schedule, which will take account of the lifespan of the various components such that they are replaced prior to failure. It will be including inspection and testing, fluid (oils and hydraulics) top-ups and part refurbishment/replacement.
- **Unplanned maintenance:** this applies to defects occurring that require rectification outwith the planned maintenance periods. The scope of such maintenance would range from small defects on non-critical systems to failure or breakdown of main components potentially requiring them to be repaired or replaced.
- **Periodic overhauls:** these will be carried out in accordance with equipment manufacturer's warranty and specifications.

4.7.2.4 Planned maintenance activities and the majority of unplanned maintenance activities will be carried out in situ. Maintenance and inspection activities shall be undertaken throughout the year. More intensive maintenance is likely to take place during the spring and summer months when weather is more workable. Due to the distance from shore, onsite maintenance will be carried out from a maintenance vessel stationed in the Array Area. This will return to port for crew change and resupply periodically.

4.7.2.5 During periods of intensive maintenance or periodic inspection additional vessels may be mobilised.

4.7.2.6 The ability to attend site in the winter months for unplanned maintenance will be retained.

4.7.2.7 In general, all maintenance shall be undertaken in-situ without tow-back to shore. During instances of periodic overhauls or significant malfunctions which cannot be rectified offshore, the FTU will be detached from the inter-array cable and mooring system. Subsequently, it will be towed back to shore for necessary maintenance procedures to be conducted within a port facility. The system shall be designed to enable this and for tow-back to a UK port where feasible to do so. Detached mooring lines or cables will be laid on the seabed with appropriate markers for retrieval. No surface buoy is required. This strategy ensures that upon the FTUs return, the mooring cables can be efficiently retrieved and reconnected to the substructure.

4.7.2.8 It should be noted that the use of deepwater jack-up platforms may be considered as a potential strategy during the overhaul process or in the event of a major breakdown. This approach is currently under evaluation and may be incorporated into the maintenance plan if deemed beneficial.

4.7.3 Decommissioning

4.7.3.1 Decommissioning requirements are set out in the Energy Act 2004 (as amended)[49] and latest Decommissioning of Offshore Renewable Energy Installation Guidance[50]. These will influence the design of the Project and be a key requirement under the CES lease agreement.

4.7.3.2 A decommissioning programme will be prepared prior to construction, in line with the requirements of the Energy Act 2004 (as amended). However, for the purpose of this report, the following has been assumed:

- FTU substructure components will be removed and towed to port;
- Mooring lines will be removed, and where possible anchors will be removed or cut a suitable distance below the mudline with the upper portion removed;
- Cables no longer required will be removed where safe to do so; where they cross live assets, they may be cut and left in situ to prevent damage to other infrastructure; and
- The offshore substation(s) will be decommissioned with the jacket and topside(s) removed and brought to shore. The piles holding the jackets in place will be cut a suitable distance below the mudline to allow the jacket to also be brought to shore for decommissioning.

4.7.3.3 If any of the infrastructure, moorings, cabling or offshore substations and converter stations are suitable for repowering then they will be retained for reuse in the updated system. All materials brought to shore will be decommissioned and waste managed in accordance with the waste hierarchy (Waste (Scotland) Regulations 2012)[51] for instance, reused or recycled rather than disposed of to land. All the steel elements will be recyclable.

4.7.3.4 The approach to decommissioning, including cable decommissioning, will be reviewed as part of the decommissioning programme. It is expected that decommissioning will require similar vessels to those used in construction and take a similar period of time.

5. ENVIRONMENTAL BASELINE

5.1 Introduction

5.1.1.1 This section provides an overview of the environmental characteristics relevant to the receptors under consideration as part of the HRA screening process, specifically:

- Benthic ecology;
- Marine mammals; and
- Offshore ornithology.

5.1.1.2 Baseline information relevant to the determination of potential LSE relates to the Cenos Offshore Array Area and ECC.

5.1.1.3 The information presented here draws on existing information and wider technical reporting in the public domain and also preliminary site-specific survey information where available.

5.2 Benthic Ecology

5.2.1 Data Sources

5.2.1.1 The principal data sources used to inform the benthic ecology baseline characterisation for the HRA comprise the following:

- Initial scoping study of the Cenos Offshore Windfarm (the "2023 Scoping Report"[12]), including literature review of benthic environment.
- Conservation Advice Packages and monitoring reports of the protected sites overlapping or surrounding the Project.
- Publicly available data, such as European Marine Observation and Data Network (EMODnet[52]), UK Offshore Energy Strategic Environmental Assessment 4 (OESEA4[53]), the Oslo and Paris Convention for the protection of the environment of the North-East Atlantic (OSPAR) Quality Status Report (QSR) 2023[54], Geodatabase of Marine features adjacent to Scotland (GeMS[55]), The Marine Life Information Network (MarLIN[56]), Habitat Map of Scotland (HabMoS[57]), Multi-Agency Geographic Information for the Countryside (MAGIC[58]), National Marine Plan Interactive (NMPi[59]).
- Project specific data, such as the Habitats Assessment and Environmental Benthic Survey (EBS) Reports following from the survey campaigns undertaken in Q3 2023 and Q1 2024. These will be available to inform the RIAA.

5.2.1.2 The Array Area is located within the East of Gannet and Montrose Fields NCMPA which is designated for the protection of 'offshore deep sea muds' and 'ocean quahog (*Arctica islandica*) aggregations (including sands and gravels as their supporting habitat)'. EMODnet data suggest that the primary habitat types likely to occur within the Array Area are sandy sediments with some muddier sediments found at the southeastern edge of the boundary. Surveys of the East of Gannet and Montrose Fields NCMPA describe the extent and distribution of benthic habitats and identified three main European Nature Information System (EUNIS) habitat types: A5.2 Sublittoral sand, A5.3 Sublittoral mud and A5.4 Sublittoral mixed sediment[52] Overall, mixed sediments are sparsely distributed within the area. The extent of the Priority Marine feature (PMF) 'offshore deep muds' had increased from previous surveys conducted in 2015 and were found in deeper areas within the East of Gannet and Montrose Fields NCMPA (i.e. 88 m – 102 m depths)[52].

5.2.1.3 Surveys conducted by Fugro in 2017 within the Madoes oil and gas field immediately adjacent to the proposed Array Area (and within the initial survey area – **Figure 5-1**), confirm the presence of the two main biotope complexes. These are 'circalittoral muddy sand' (A5.26/SS.SSa.CMuSa); a soft sediment habitat and 'circalittoral mixed sediment' (A5.44/SS.SMx.CMx) a coarser gravel sediment type[60]. Elements of the OSPAR-listed threatened and/or declining habitat 'Sea pen and burrowing megafauna communities'[61] were also detected as part of the Madoes survey. The EUNIS biotope 'circalittoral muddy sand' also falls within the broad PMF habitat classification of 'offshore subtidal sands and gravel'.

Table 5-1: The main biotopes within the East of Gannet and Montrose Fields NCMPA[62]. Infaunal biotope*, and epifaunal biotope**

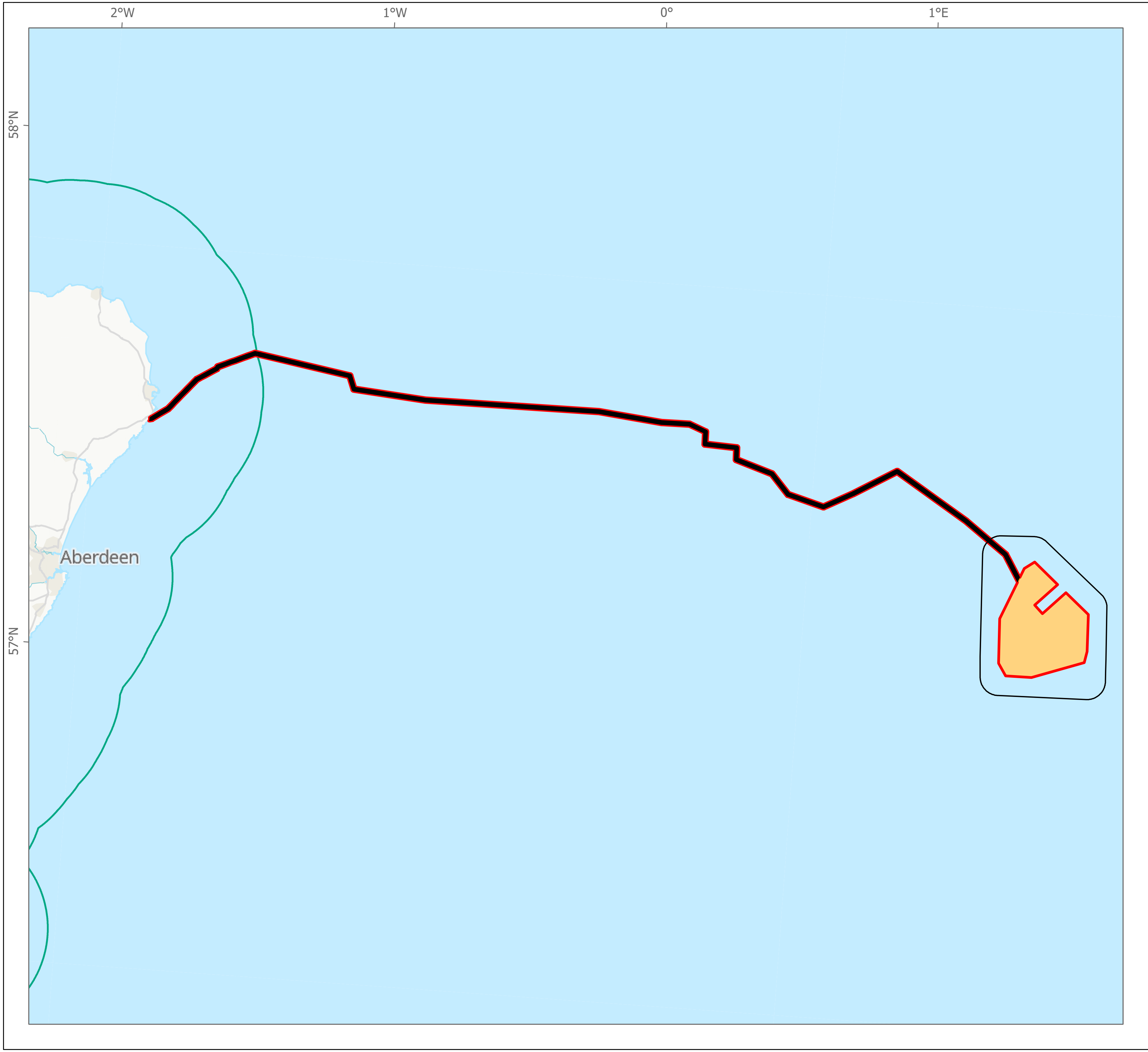
Biotope name	Biotope code	Species associated
Paramphinome jeffreysii, Thyasira spp. and *Amphiura filiformis* in offshore circalittoral sandy mud*	SS.SMu.OMu.PjefThyAfil	*Paramphinome jeffreysii* (bristle worm) *Thyasira* spp. (hatchet shell) *Amphiura filiformis* (brittle star)
Owenia fusiformis and *Amphiura filiformis* in offshore circalittoral sand or muddy sand*	SS.SSa.OSa.OfusAfil	*Owenia fusiformis* (tube worm) *Amphiura filiformis*
Sea pens and burrowing megafauna in circalittoral fine mud**	SS.SMu.CFiMu.SpnMeg	-
Circalittoral sandy mud**	SS.SMu.CSaMu	-
Circalittoral mixed sediment**	SS.SMx.CMx	-
Virgularia mirabilis and *Ophiura* spp. with *Pecten maximus* on circalittoral sandy or shelly mud**	SS.SMu.CSaMu.VirOphPmax	*Virgularia mirabilis* (sea pen) *Ophiura* spp. (brittle star) *Pecten maximus* (king scallop)

5.2.1.4 **Table 5-1** shows a summary of the main biotopes within the NCMPA based on McCabe et. al 2020[62].[1]

5.2.1.5 According to unpublished recent data from the project specific surveys, the habitat types occurring along the proposed ECC are deep circalittoral sand along most of the route, with a mix of coarse and fine sediments with hard substrates found at various locations mostly inshore. These habitat types are very common and widespread in the Central North Sea.

5.2.1.6 The benthic communities associated with these habitats are generally dominated by annelids (bristleworms and tubeworms), molluscs (clams and sea snails), and echinoderms (starfish and sea urchins). GeMS data were also used to identify any PMFs across the proposed ECC and Array Area. PMFs are defined as habitats and species considered to be marine conservation priorities in Scottish waters. GeMs data indicate the presence of ocean quahog (a protected species of the East Gannet NCMPA) and potentially Ross worm (*Sabellaria spinulosa*) reefs in the area. *Sabellaria* aggregations are known to be present in this region of the North Sea from previous development surveys. Where these aggregations form reefs, they are of conservation value and listed under OSPAR and in Annex I of the European Union Council Directive 92/43/EEC (Habitats Directive)[21].

5.2.1.7 Impacts on the MPA referenced above are considered further in a MPA Screening Assessment which has been submitted as part of the Scoping Report[13] and will not be considered further in this HRA Screening.



LEGEND

- Array Area
- Proposed Export/Import Cable Corridor
- Project Area
- 12 NM Boundary
- Digital Area Survey Boundary (4km buffer)

0 40
Kilometres

Data:
© National Grid UK
Esri
Esri, HERE
Contains OS data © Crown Copyright and database right 2023
Contains data from OS Zoomstack

PROJECT: Cenos Offshore Windfarm

TITLE: Figure 5-1 Digital Aerial Survey Area for Cenos Offshore Windfarm

REV	DATE	COMMENTS	DRAWN	CHECKED
001	26/03/2024		UKGIE775	DN

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5.3 Marine Mammals

5.3.1.1 There are four marine mammal species which are listed in Annex II of the Habitats Directive and have therefore been considered in the Screening Report. These are:

- Harbour porpoise (*Phocoena Phocoena*);
- Bottlenose dolphin (*Tursiops truncatus*);
- Grey seal (*Halichoerus grypus*); and
- Harbour seal (*Phoca vitulina*).

5.3.1.2 European otter (*Lutra lutra*) are also listed on Annex II of the Habitats Directive and can be considered a semi-aquatic mammal. Otters are assessed in the onshore HRA for the NorthConnect Interconnector Project[63] where it is established that there are no European sites within the relevant study area for this species. Otter is therefore not considered further in this HRA screening report.

5.3.2 Data Sources

5.3.2.1 The principal data sources used to inform the marine mammals baseline characterisation for the HRA comprise the following:

- Initial scoping study of the Cenos Offshore Windfarm (the "2023 Scoping Report[12]"), including literature review of marine mammals' presence;
- Site-specific baseline characterisation DAS: two-year monthly survey from April 2021 to March 2023, covering a sea area of (835.9 km^2) and extending 4 km from the Array Area boundary, as shown in **Figure 5-1**;
- Surveys of marine mammal populations across the North Sea, such as the atlas of cetacean distribution, seal telemetry data, (Small Cetaceans in European Atlantic Waters and the North Sea (SCANS-IV[64]), Phase III Data Analysis of Joint Cetacean Protocol[65], OESEA4[53], OSPAR QSR 2023[54];
- Updated abundance estimates for cetacean Management Units (MU) in UK waters[66];
- Pinniped abundance and density from Special Committee on Seals (SCOS) annual reporting of scientific advice on matters related to the management of seal populations;
- Regional baselines for marine mammal knowledge across the North Sea and Atlantic areas of Scottish waters (Scottish Marine and Freshwater Science Vol 11 No 12)[67]; and
- Project specific data, such as the Marine Mammal Observation and Passive Acoustic Monitoring (PAM) Survey Reports following from the survey campaigns undertaken in Q3 2023 and Q1 2024. These will be available to inform the RIAA.

5.3.3 Harbour Porpoise

5.3.3.1 Based on monthly DAS conducted 2021 – 2023, the most common marine mammal in the Project area is the harbour porpoise. They were recorded throughout the survey period with numbers peaking in November 2021. A total of 152 harbour porpoise were recorded in the DAS area between April 2021 and March 2023[68].

5.3.3.2 Harbour porpoises were found in higher densities to the east of the surveyed area (including the eastern part of the proposed Array Area) in April 2021, whereas in June 2021 they were located more in the west of the survey area (to the west of the Array Area). In November

2021, when observations peaked, they were more widely distributed over the survey area except for the southwest. There were five female/calf pairs recorded in June 2021.

5.3.3.3 As harbour porpoise are wide-ranging within the North Sea Marine Mammal Management Unit (MMMU)[66], no discrete population can be assigned to an individual protected site.

5.3.4 Bottlenose Dolphin

5.3.4.1 Bottlenose dolphins were not observed in the proposed Array Area over the course of two years of monthly DAS[68].

5.3.4.2 Two ecotypes of bottlenose dolphin are recognised in UK waters; a wide-ranging offshore type and an inshore coastal type that have populations with limited interchange between them. This is reflected in the assignment of MUs for this species. Connectivity is considered possible between the Project and any protected sites where bottlenose dolphins are listed as a qualifying feature within the Greater North Sea and Coastal East Scotland MUs[69] and these are thus considered in this screening. Therefore, the only SAC of relevance for this project is the Moray Firth SAC which is for coastal type bottlenose dolphins.

5.3.5 Grey Seal

5.3.5.1 Six grey seals were recorded within the proposed Array Area in monthly DAS conducted between 2021 – 2023[68].

5.3.5.2 Grey seals are wide ranging and can breed and forage in different areas. They typically forage in the open sea and return regularly to land to haul-out, although they may frequently travel up to 100 km between haul-out sites. Foraging trips generally occur within 100 km of their haul-out sites, although grey seals can travel up to several hundred kilometres offshore to forage[70], as demonstrated by their occasional presence within the proposed Array Area. Grey seals tend to have localised regions (within 20 km of haul out sites) of higher density generally concentrated closer to the breeding season[71].

5.3.6 Harbour Seal

5.3.6.1 Harbour seals were not recorded within the DAS area between 2021 and 2023[68].

5.3.6.2 Harbour seals have relatively small ranges in comparison to grey seals, and are typically more coastal in habit, generally within 50 km of the coast[72]. Harbour seal tend to make relatively short foraging trips from haul out sites and typically forage at distances of 40 km to 50 km from haul out sites[73] with highest densities near their haul out sites[74]. However, some tracking studies have shown that they occasionally travel 200 km between haul-out sites[75,76]. The range of these trips varies depending on the location and surrounding marine habitat.

5.4 Offshore Ornithology

5.4.1 Data Sources

5.4.1.1 Ornithological surveys have been extensive in the North Sea in relation to offshore wind development. These have shown that the North Sea is an important area for the UK's breeding seabirds, as well as during migratory passage periods and in winter months when UK breeding birds are joined by seabirds that have migrated from European and Arctic regions.

5.4.1.2 Typically, it has been found that through an annual cycle, populations of birds present can relate to those breeding at coastal seabird colonies, overwintering populations, and those undertaking passage/migration. The Project is proposed to be further north-east within the North Sea than consented Scottish offshore wind projects; seabird diversity and abundance are therefore considered likely to differ to those projects situated in more coastal or southern waters.

5.4.1.3 Two years of DAS have been undertaken. These comprised monthly surveys of the survey area shown on **Figure 5-1** (original development area plus a 4 km buffer zone) from April 2021 to March 2023. Transects were spaced 2.5 km apart, covering circa 10 percent of this survey area. Data were then analysed to assign the species observed. DAS recorded over 8,000 birds of 16 species. The most abundant of these were guillemot (*Uria aalge*) and fulmar (*Fulmarus glacialis*), both with peak densities in the non-breeding season. Gannet records peaked during post-breeding migration in 2022. Kittiwakes (*Rissa tridactyla*) were present in moderate densities, with a density peak in May 2022 that suggested kittiwakes may chiefly be present on migration.

5.4.1.4 **Table 5-2** presents raw observations for the Survey Area, Array Area, and Array Area plus 2 km buffer specific to the current design.

Table 5-2: Total observations from site-specific DAS between April 2021 and March 2023 for the Survey Area, Array Area, and Array Area plus 2 km buffer (identified to species level)

Species	Survey Area	Array Area	Array Area Site + 2 km buffer
Guillemot	6,557	2,584	3,945
Fulmar	1,140	407	650
Gannet	269	134	179
Kittiwake	169	58	85
Puffin	86	34	48
Great black-backed gull	58	28	33
Razorbill	19	12	14
Herring gull	15	5	10
Arctic tern	13	5	13
Knot	8	8	8
Common scoter	4	0	0
Common gull	3	0	1
Great skua	2	1	1
Arctic skua	2	2	2
Little auk	1	1	1
Little gull	1	0	1
Total	**8,347**	**3279**	**4,991**

5.4.1.5 The main sources of information, in addition to the DAS, on offshore ornithology drawn on for this screening stage, and that will be drawn on further in the RIAA, are detailed in **Table 5-3**. This includes wintering and breeding surveys for the NorthConnect Interconnector Project from which part of the assessment of the ECC will be informed.

Table 5-3: Ornithology sources of information and guidance documents relevant to HRA screening and RIAA

Source	Date	Summary
Wintering and breeding bird surveys for NorthConnect interconnector	2018	Monthly seabird counts along coast/cliffs, February 2016 to January 2017.
Green Volt site-specific aerial surveys	2023	Site-specific DAS for ornithological receptors, May 2020 to April 2022.
JNCC Online SPA standard data forms for Natura2000 sites	Various	Species-specific data for UK protected sites (SPAs).
Seabird Monitoring Programme (SMP) colony counts	Various	Species-specific colony counts for UK colonies.
The identification of possible marine SPAs for seabirds in the UK: The application of Stage 1.1. – 1.4 of the SPA selection guidelines[77]	2012	Identification and classification of suitable marine habitat for conservation of Annex I species.
Non-breeding season populations of seabirds in UK waters: Population sizes for Biological Defined Minimum Population Scales (BDMPS)[36]	2015	Seabird population and demographic rate data.
Breeding density, fine-scale tracking and large-scale modelling reveal the regional distribution of four seabird species[78]	2017	At-sea distribution of seabird species from UK and Irish colonies.
Desk-based revision of seabird foraging ranges used for HRA screening[79]	2019	Species-specific breeding season foraging range data.
Distribution maps of cetacean and seabird populations in the North-East Atlantic[80]	2020	Distribution of seabirds and cetaceans on the north-east Atlantic between 1980 and 2018.
Interspecific variation in non-breeding aggregation: a multi-colony tracking study of two sympatric seabirds[81]	2022	Non-breeding distribution and population aggregation seabirds from UK colonies.
Auk tagging project: final report, January 2023[82]	2023	Non-breeding distribution and population aggregation seabirds from UK colonies. Links to data presented in Buckingham *et al*[81].
Scaling possible adverse effects of marine windfarms on seabirds: developing and applying a vulnerability index[83]	2004	Development of Windfarm Sensitivity Index (WSI) for seabirds in the Germany Exclusive Economic Zone (EEZ).
Assessing vulnerability of marine bird populations to offshore windfarms[84]	2013	Vulnerability of seabirds to offshore windfarms
Incorporating data uncertainty when estimating potential vulnerability of Scottish seabirds to marine renewable energy developments[85]	2016	Uncertainty in assessment of vulnerability of seabirds to offshore renewable energy developments.
Mapping seabird sensitivity to offshore windfarms[86]	2017	Sensitivity of seabirds to offshore windfarms in English territorial waters.

Source	Date	Summary
Identifying important at-sea areas for seabirds using species distribution models and hotspot mapping[87]	2020	Hotspot mapping using Species Distribution Models (SDMs) for four seabird species.
Population consequences of displacement from proposed offshore wind energy developments for seabirds breeding at Scottish SPAs[88]	2014	Development of model to estimate effect of displacement due to offshore windfarms on seabirds.
Finding out the fate of displaced birds[89]	2018	Explanation of SeabORD to assess displacement of seabirds by offshore windfarms.
Using a Collision Risk Model to Assess Bird Collision Risks for Offshore Wind Farms[90]	2012	Development of model to assess collision risk of seabirds with offshore windfarms.
The Avoidance Rates of Collision Between Birds and Offshore Turbines[91]	2014	Assessment of avoidance rates to use in CRM of seabirds with offshore windfarms.
Modelling flight heights of marine birds to more accurately assess collision risk with offshore wind turbines[92]	2014	Development of generic flight height data to be used in CRM.
Seabirds and offshore windfarms in European waters: Avoidance and attraction[93]	2016	Assessment of avoidance rates of seabirds with offshore windfarms.
Bird Collision Avoidance: Empirical evidence and impact assessments[94]	2018	Assessment of avoidance rates to use in CRM of seabirds with offshore windfarms.
ORJIP Bird Collision and Avoidance Study[95]	2018	Assessment of avoidance rates to use in CRM of seabirds with offshore windfarms.
Consideration of avoidance behaviour of northern gannet (*Morus bassanus*) in collision risk modelling for offshore windfarm impact assessments[96]	2023	Assessment of avoidance rates to use in CRM of seabirds with offshore windfarms.
A population viability analysis modelling tool for seabird species[97]	2019	Explanation around how to use the tool which is required for population viability analysis.

6. BENTHIC ECOLOGY SCREENING

6.1 Benthic Ecology Site Selection Criteria

6.1.1.1 The following sections detail the results of the stepwise process to identify the European sites with relevant Annex I Habitats to be taken forward for detailed determination of LSE based on the methodology outlined in **Chapter 2: The Habitats Regulations Assessment process** and the criteria specified below.

6.1.2 Criterion 1

6.1.2.1 Criterion 1 for the identification of European or Ramsar sites to be taken forward for consideration of LSE considers those sites which overlap with the boundaries of the Project. Based on this criterion, the Buchan Ness to Collieston SAC has been identified and is adjacent to the western end of the nearshore section of the ECC (landfall area). The SAC is designated for the following feature as a primary reason for site selection: Vegetated sea cliffs of the Atlantic and Baltic Coasts[98]. The links to the citation for this site is contained within **Appendix A**.

6.1.3 Criterion 2

6.1.3.1 Criterion 2 considers European or Ramsar sites with qualifying mobile features/species whose range (for instance, foraging, migratory, overwintering, breeding or natural habitat range) overlaps with the Project. There are no European sites which meet this criterion for Annex I benthic habitats and no sites are screened in for further consideration on this basis.

6.1.4 Criterion 3

6.1.4.1 Criterion 3 considers European or Ramsar sites and/or qualifying features which are located within the potential Zone of Influence (ZoI) of impacts associated with the Project. There is the potential for indirect effects to sites designated for Annex I habitats as a result of impacts associated with increased suspended sediment concentrations (SSC) arising from construction activities or from changes to the hydrodynamic regime as a result of the presence of offshore infrastructure associated with the Project. The extent of these impacts is considered likely to extend beyond the boundaries of the Project.

6.1.4.2 The ZoI for such indirect effects is typically defined from the outputs of physical processes modelling or desk-based assessment to determine, for example, the fate of sediments resuspended during the construction process. Physical processes assessment will be undertaken for the Project to inform the EIA and RIAA; however, this has not been carried out at LSE Screening stage.

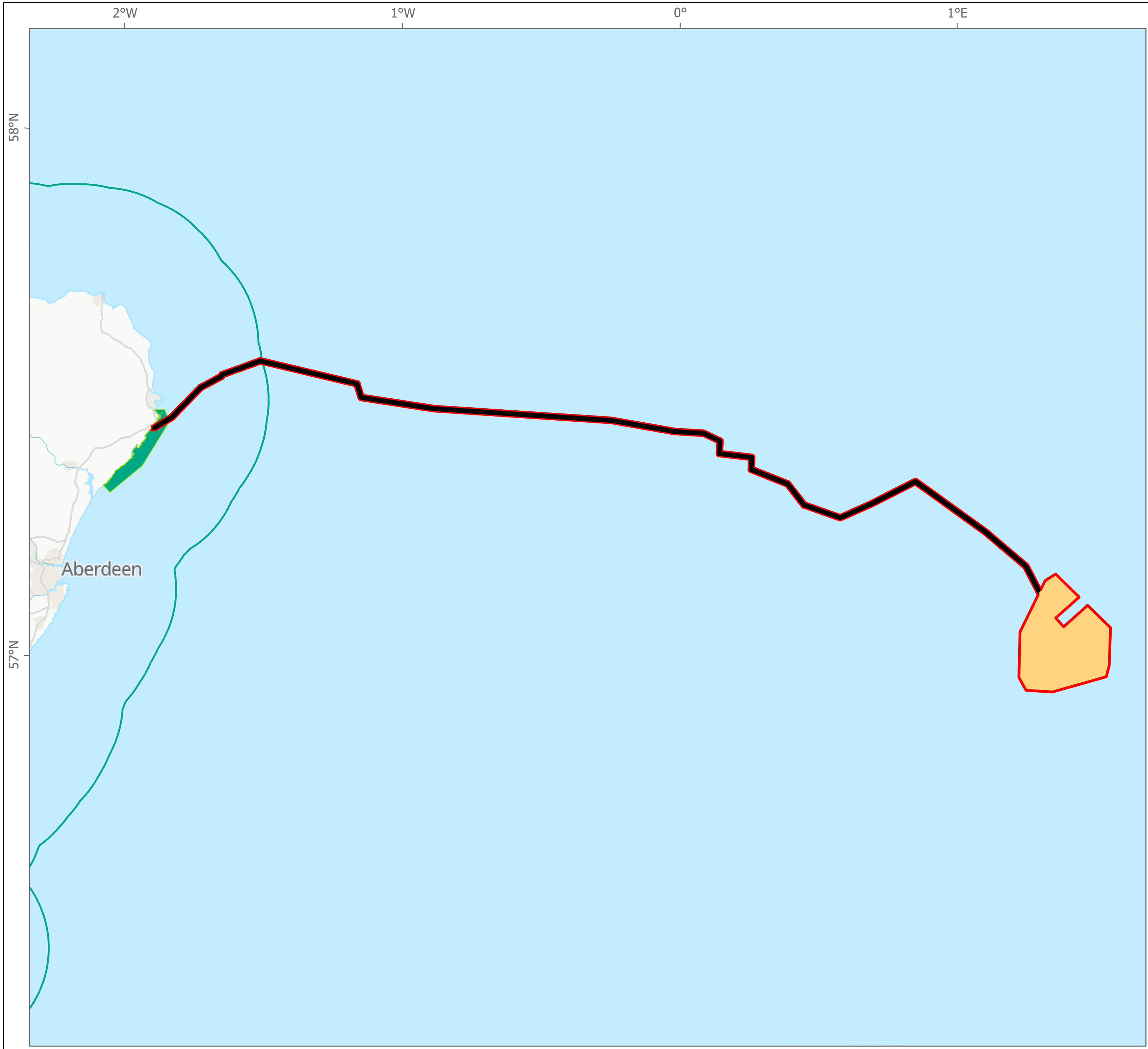
6.1.4.3 Therefore, in the absence of full physical processes assessment, the ZoI has been defined to encompass the tidal excursion, which applies a reasonable and suitable level of precaution and is a standard approach. This equates to a maximum extent of 15 km in a northwest to a southeast direction, as presented in **Table 6-1**. The Buchan Ness to Collieston SAC is located adjacent to the proposed nearshore ECC; however, the designation does not provide information on the intertidal species of the cliffs. All other SACs are beyond 15 km from the Project, with Dogger Bank SAC[99] being the closest at 202 km south of the Project area. On this basis, it is considered that no other protected sites for which Annex I habitats are a qualifying feature have been taken through for consideration of LSE based on this criterion. The Buchan Ness to Collieston SAC is further listed in **Table 6-2** and shown in **Figure 6-1**.

Table 6-1: Annex I habitat ZOI

Receptor	ZoI	Reference
Annex I habitats	15 km	In the absence of fully physical processes modelling at this stage, the ZoI has been defined to encompass the tidal excursion, which applies a reasonable and suitable level of precaution. This equates to a maximum extent of 15 km in a northwest to a southeast direction offshore and along a north to south axis closer to the shore.

Table 6-2: Selected Annex I habitat site taken forwards for assessment of LSE

Designated Site	Relevant qualifying feature highlighted through site selection	Range from	
		Array boundary (km)	ECC (MHWS-seawards) (km)
Buchan Ness and Collieston SAC	Vegetated sea cliffs of the Atlantic and Baltic Coasts	186	0



LEGEND

- Array Area
- Proposed Export/Import Cable Corridor
- Project Area
- 12 NM Boundary
- Buchan Ness to Collieston Coast SAC - Annex I Vegetated Sea Cliffs

0 40
Kilometres

Data:
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PROJECT: Cenos Offshore Windfarm

TITLE: Figure 6-1 SAC Annex I habitats

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6.2 Benthic Ecology - Identification of Potential Effects

6.2.1.1 This step identifies whether impacts of the Project (during construction, operation and maintenance and decommissioning) described in **Chapter 4: Project Description** have the potential to result in LSE on the qualifying features of the European site identified for benthic ecology.

6.2.1.2 Effect identification has been informed by the Sectoral Marine Plan for Offshore Wind Energy[100] and the Appropriate Assessment for Sectoral Marine Plan for Offshore Wind Energy[101], as well as industry experience and feedback received through the Scottish Ministers 2023 Project Scoping Opinion[31].

6.2.1.3 The main mechanisms by which the Project could affect European sites are through either direct or indirect impact pathways, as described in **Table 6-3**.

Table 6-3: Potential effect pathway during construction (C), operation and maintenance (O&M) and decommissioning (D) on benthic ecology

Potential effect pathway	C	O&M	D	ZoI	Justification
Temporary or long-term impacts to the seabed and benthic habitats.	N	N	N	Within proposed ECC	The landfall will be constructed using HDD from the cliff top to an exit pit approximately 200 m offshore, therefore there will be no activity in the intertidal zone. Similarly, maintenance and decommissioning will not impact the intertidal environment. No pathway of effects on the qualifying feature is therefore present. The location of the exit pit offshore also means that any required UXO clearance would not have a pathway to impact the vegetated sea cliffs.
Potential changes to suspended sediment concentrations.	N	N	N	15 km (tidal excursion)	There are no subtidal or intertidal habitat qualifying features for this site; therefore, no pathway of effects is present from these impacts.
Potential effects from EMF and heat generated by cables.	N	N	N	<10 m	Operating cables generate heat and EMF that may locally affect benthic organisms. Tunnelling under shoreline will attenuate EMF and heat emissions and no significant radiation from the cable is anticipated to be evident at the surface.
Accidental spills to the marine environment.	N	N	N	Within proposed ECC	Construction, operation and maintenance, and decommissioning activities in the ECC may result in accidental pollution release from machinery used by the Project. These impacts will be minimised through the application of standard good management practice. No machinery will be located in the intertidal zone and therefore it is concluded that there is no credible pathway for the effect.

6.3 Benthic Ecology - Determination of the Potential for Likely Significant Effects

6.3.1.1 The outcome of the process of identifying sites relevant to benthic ecology as detailed in Section 6.1 is a 'long list' of designated sites and their relevant qualifying features. These sites and features are subject to consideration of the potential for LSE within this section of the report. This takes account of the identified potential effects for construction, operation and maintenance, and decommissioning phases of the Project as outlined in **Chapter 4: Project Description**.

6.3.1.2 **Table 6-4** identifies the LSEs for the sites identified in Section 6.1 and provides justification.

6.3.1.3 The assessment of LSE in the following sections is based on a series of matrices setting out whether LSE can be excluded for the relevant features of the European sites identified for each receptor. The matrices are presented in **Appendix B**.

6.3.1.4 The matrix approach adopted is based upon an approach set out within the Planning Inspectorate's Advice Note 10 on HRA[102] which relates to Nationally Significant Infrastructure Projects (NSIPs). Although it is acknowledged that this guidance is not directly applicable to Scottish projects, the approach is considered to be pragmatic and useful in defining the extent of impacts from the Project on identified designated sites' qualifying features, in relation to the sites' conservation objectives. It also provides a clear audit trail for agreement with the statutory consultees on the scope of the HRA and the features and impacts to be taken forward into the AA each site.

Table 6-4: Determination of the potential for LSE on SACs with benthic ecology as qualifying features for the Project

Designated Site	Features Screened in	Potential effect pathway	Consideration of Potential LSE	Potential for LSE
Buchan Ness to Collieston SAC	Vegetated sea cliffs of the Atlantic and Baltic Coasts	No realistic pathways identified.	The Buchan Ness to Collieston SAC is located within the proposed ECC; however, the designation relates to a qualifying feature above MHWS and no intertidal or subtidal species are included in the feature. As the design for the Project involves use of HDD to route the cables from a point approximately 200 m out to sea to a point 100 – 120 m inland of the cliffs where the qualifying feature is located, there will be no LSE arising from habitat disturbance. Tunnelled cable will eliminate effects of EMF and heat. There will be no requirement for machinery to cross the cliff line therefore there is no realistic potential pathway for LSE as a result of accidental spills.	**No**

7. MARINE MAMMAL SCREENING

7.1 Marine Mammal Site Selection Criteria

7.1.1.1 The following sections detail the results of the stepwise process to identify the European sites with relevant Annex II marine mammal species to be taken forward for detailed determination of LSE based on the methodology and criteria outlined in **Table 3-1**.

7.1.2 Criterion 1

7.1.2.1 There are no sites with Annex II marine mammal species as qualifying features which spatially overlap with the Project, therefore no sites are screened in for further consideration for marine mammals based on this criterion, so consideration under the second criteria is as follows.

7.1.3 Criterion 2

7.1.3.1 Marine mammals are highly mobile species, which can forage over wide areas. Therefore, there is potential for activities associated with the construction, operation and maintenance and decommissioning of the Project to result in impacts on Annex II marine mammal species at distance from the sites for which they are qualifying features. The following paragraphs present the range for different qualifying features. A summary is presented below in **Table-7-1.**

Cetaceans

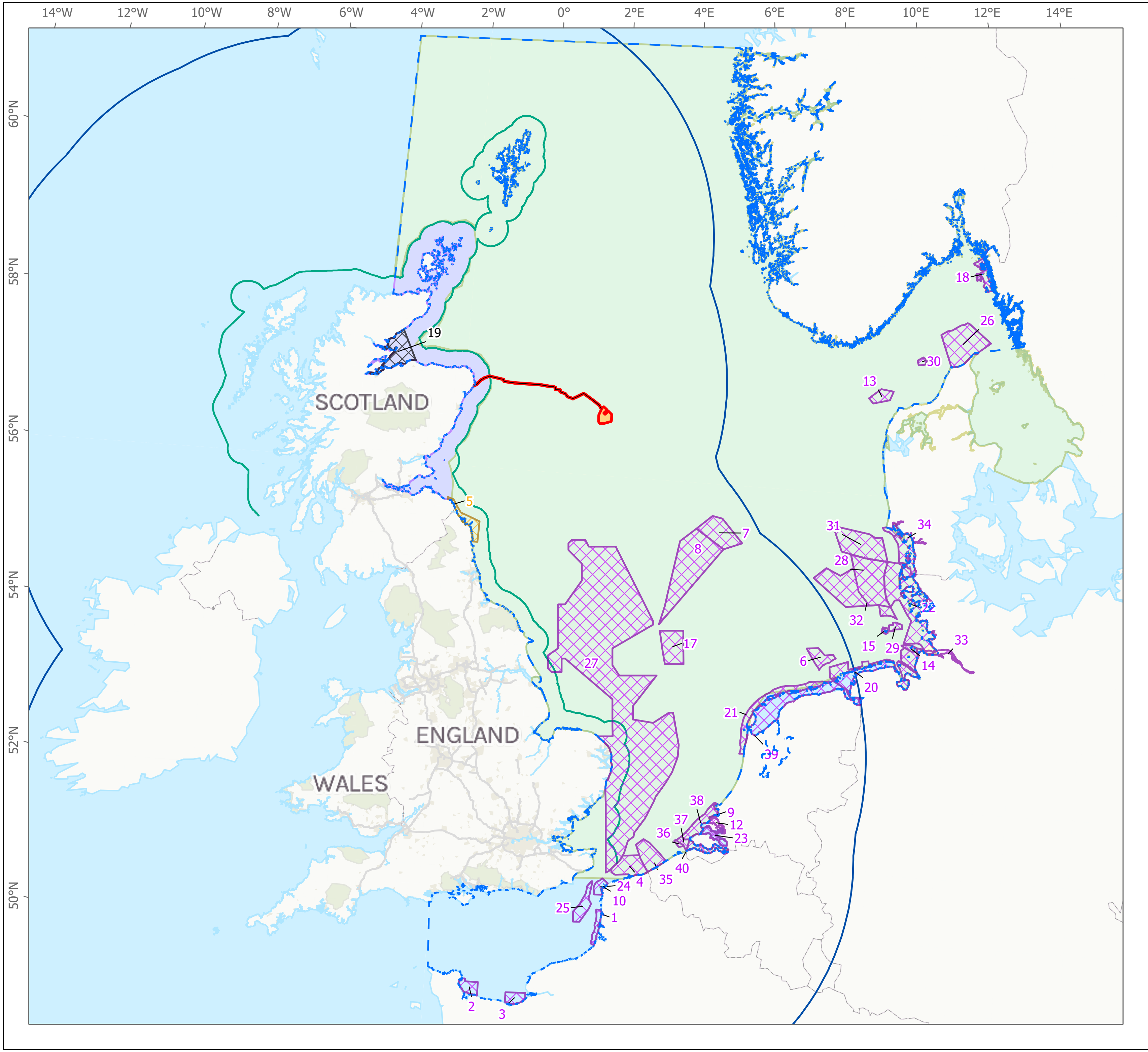
7.1.3.2 The site selection process applied for cetacean species is based on the species-specific MU. At the screening stage all designated SACs within the specific MMMU are considered for harbour porpoise and bottlenose dolphin.

7.1.3.3 For harbour porpoise, the regional Study Area includes the North Sea MU between Shetland and the English Channel and extends eastwards to include the coastline and waters of Norway, Sweden, Germany, Denmark, and The Netherlands as shown in **Figure 7-1**. All designated sites outwith the North Sea MU have been screened out from further consideration.

7.1.3.4 For bottlenose dolphin, MUs are defined for different dolphin ecotypes (coastal vs offshore) and in this case include the Greater North Sea and Coastal East Scotland MUs.

7.1.3.5 The cetacean MUs are defined by the Inter-Agency Marine Mammal Working Group[66]. The identification of the relevant sites designated for Annex II cetaceans (i.e. harbour porpoise and bottlenose dolphins) was undertaken using a precautionary approach to capture all sites with these species as qualifying features located within the marine mammal Study Area that could potentially be affected and are therefore taken forward for assessment.

7.1.3.6 A total of 36 European sites for harbour porpoise and one site (Moray Firth SAC) for bottlenose dolphin have been screened in using this criterion. These are listed in **Table-7-1** and shown in **Figure 7-1.** The links to the citation for these sites are contained within **Appendix A**.



LEGEND

- Array Area
- Proposed Export/Import Cable Corridor
- Project Area
- 200 NM Boundary
- 12 NM Boundary
- Greater North Sea MU Harbour porpoise
- Coastal East Scotland MU Bottlenose Dolphin
- North Sea MU - Harbour Porpoise

Special Areas of Conservation

Designated species

Bottlenose dolphin

19 - Moray Firth

Grey Seal

5 - Berwickshire and NNC

Harbour porpoise

1 - Baie de Canche
2 - Baie de Seine occidentale
3 - Baie de Seine orientale
4 - Bancs des Flandres
6 - Borkum-Riffgrund
7 - Doggerbank
8 - Doggersbank
9 - Duinen Goeree
10 - Falaises du Cran
12 - Grevelingen
13 - Gule Rev
14 - Hamburgisches Wattenmeer
15 - Helgoland mit
17 - Klaverbank
18 - Kosterfjorden-Väderöfjorden
20 - Nationalpark
21 - Noordzeekustzone
22 - NTP S-H Wattenmeer
23 - Oosterschelde
24 - Récifs Gris-Nez Blanc-Nez
25 - Ridens et dunes
26 - Skagens Gren og Skagerak
27 - Southern North Sea
28 - SPA Östliche Deutsche Bucht
29 - Steingrund
30 - Store Rev
31 - Sydlige Nordsø
32 - Sylter Außenriff
33 - Unterelbe
34 - Vadehavet med
35 - Vlaamse Banken
36 - Vlakte van de Raan SAC
37 - Vlakte van de Raan SCI
38 - Voordelta
39 - Waddenzee
40 - Westerschelde & Saeftinghe

0 200

Kilometres

Data:
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PROJECT: Cenos Offshore Windfarm

TITLE: Figure 7-1 Location of designated sites screened for LSE for Annex II marine mammals

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Grey Seal

7.1.3.7 For grey seals, the advice from NatureScot and MD-LOT has been to consider screening buffers of 20 km for grey seals around the SACs to ensure the qualifying features are fully assessed[103,104]. Grey seal SACs are designated as a breeding colony. During the breeding season grey seals are rarely seen to travel beyond 20 km. Therefore, based on SNCB advice this is an appropriate screening distance[71]. Although grey seals can travel far greater distances for foraging trips (in excess of 100 km) this is outside the breeding season and therefore does not impact the Conservation Objectives for grey seal SACs. Impacts to Grey Seal outwith the Breeding Season will be assessed in the EIA.

7.1.3.8 Using the above advice no designated sites in Scottish waters for grey seal will be taken forward to the assessment of LSE. Isle of May SAC designated for grey seal is 253 km from the Array Area and 147 km away from the ECC, and Faray and Holm of Faray SAC designated for grey seal is 332 km from the Array Area and 199 km from the ECC location. These sites will not be considered any further being beyond the ZoI for any impacts to these sites from any activities associated with the windfarm.

7.1.3.9 Natural England advised in the 2023 Scoping Response (20 April 2023) that Berwickshire and North Northumberland Coast SAC designated for grey seal be considered. This site is 228 km from the Array Area and 169 km from the ECC and is screened in at Natural England's request noting the large distances between the site location and the Project.

7.1.3.10 The site selected is shown in **Table 7-2** and in **Figure 7-1**.

Harbour Seal

7.1.3.11 For harbour seals, NatureScot and MD-LOT advice has been to consider screening buffers of 50 km around the SACs to ensure the qualifying features are fully assessed[104]. Harbour seals are considered to exhibit site fidelity all year round. Based on telemetry data provided in the referenced study, the majority remain within 50 km of the haul-out site[71,70].

7.1.3.12 In alignment with advice from the Scottish Ministers regarding the screening of protected sites for seal qualifying features shared with the West of Orkney Windfarm[104], no designated sites in Scottish waters for harbour seal will be taken forward to the assessment of LSE.

7.1.3.13 The closest harbour seal SACs to the Project are the Firth of Tay and Eden Estuary SAC 261 km away from the Array Area and 139 km from the ECC, and Dornoch Firth and Morrich More SAC designated for harbour seal is 331 km from the Array Area and 152 km away from the ECC. These sites will not be considered any further as they are beyond the ZoI of impacts to these sites from any activities associated with the windfarm. **Table-7-1** presents the search area for cetaceans based on the MUs, and the screening buffers for pinnipeds, respectively.

Table-7-1: Annex II marine mammal ranges

Receptor	Search area and screening buffers	Reference
Cetaceans – Harbour porpoise and Bottlenose dolphin	Marine Mammal MU	Species-Specific Management Units as defined by the IAMMWG[66].
Grey seal	20 km (at sea distance)	NatureScot and MD-LOT have provided advice on West of Orkney Offshore Windfarm[104] that all SACs designated for grey seal should contain a screening buffer of 20 km.
Harbour seal	50 km (at sea distance)	NatureScot and MD-LOT have provided advice on West of Orkney Offshore Windfarm[104] that all SACs designated for grey seal should contain a screening buffer of 50 km.

Table 7-2: Annex II marine mammal designated sites taken forwards for assessment of LSE

Figure ID	Designated site	Relevant qualifying feature highlighted through site selection	Range from	
			Array Area (km)	ECC (MHWS-seawards) (km)
1	Moray Firth SAC	Bottlenose dolphin	282	94
2	Berwickshire & North Northumberland Coast SAC	Grey seal	228	169
3	Southern North Sea SAC	Harbour porpoise	173	194
4	Doggersbank SAC	Harbour porpoise	202	225
5	Doggerbank SCI	Harbour porpoise	202	225
6	Klaverbank SAC	Harbour porpoise	317	338
7	Sydlige Nordsø SAC	Harbour porpoise	361	382
8	Gule Rev SAC	Harbour porpoise	380	394
9	Sylter Außenriff SCI	Harbour porpoise	377	400
10	SPA Ostliche Deutsche Bucht	Harbour porpoise	404	425
11	Vadehavet med Ribe Å, Tved Å og Varde Å vest for Varde SAC	Harbour porpoise	430	450

Figure ID	Designated site	Relevant qualifying feature highlighted through site selection	Range from	
			Array Area (km)	ECC (MHWS-seawards) (km)
12	Borkum-Riffgrund SCI	Harbour porpoise	442	465
13	Store Rev SAC	Harbour porpoise	458	471
14	NTP S-H Wattenmeer und angrenzende Kustengebiete SAC	Harbour porpoise	457	478
15	Noordzeekustzone SAC	Harbour porpoise	463	485
16	Waddenzee SAC	Harbour porpoise	470	492
17	Nationalpark Niedersachsisches Wattenmeer SAC	Harbour porpoise	485	508
18	Skagens Gren og Skagerrak SAC	Harbour porpoise	500	513
19	Helgoland mit Helgolander Felssockel SAC	Harbour porpoise	503	525
20	Steingrund SAC	Harbour porpoise	508	530
21	Hamburgisches Wattenmeer SAC	Harbour porpoise	541	563
22	Kosterfjorden-Väderöfjorden SAC	Harbour porpoise	595	582
23	Unterelbe SAC	Harbour porpoise	570	592
24	Voordelta	Harbour porpoise	583	604
25	Duinen Goeree & Kwade Hoek SAC	Harbour porpoise	600	621
26	Grevelingen SAC	Harbour porpoise	604	625
27	Oosterschelde	Harbour porpoise	613	634
28	Vlaamse Banken SAC	Harbour porpoise	616	637
29	Vlakte van de Raan SAC	Harbour porpoise	623	644
30	Vlakte van de Raan SCI	Harbour porpoise	620	641
31	Westerschelde & Saeftinghe SAC	Harbour porpoise	626	648
32	Bancs des Flandres SAC	Harbour porpoise	638	659
33	Recifs Gris-Nez Blanc-Nez SAC	Harbour porpoise	678	700

Figure ID	Designated site	Relevant qualifying feature highlighted through site selection	Range from	
			Array Area (km)	ECC (MHWS-seawards) (km)
34	Ridens et dunes hydrauliques du détroit du Pas-de-Calais SAC	Harbour porpoise	686	707
35	Falaises du Cran aux Oeufs et du Cap Gris-Nez, Dunes du Chatelet, Marais de Tardinghen et Dunes de Wissant SAC	Harbour porpoise	687	708
36	Baie de Canche et couloir des trois estuaires SAC	Harbour porpoise	730	751
37	Baie de Seine occidentale SAC	Harbour porpoise	922	944
38	Baie de Seine orientale SAC	Harbour porpoise	924	902

7.1.4 Criterion 3

7.1.4.1 Criterion 3 considers European sites and/or qualifying features which are located within the potential ZoI of impacts associated with the Project (e.g. habitat loss/disturbance, noise and risk of collision). Given the large buffers proposed above for both cetaceans and pinnipeds in criterion 2 the ZoI for key impacts to marine mammals (for instance, underwater noise and changes to prey species) are anticipated to be well within this area. No additional European sites have marine mammal species as qualifying features, beyond those already identified for criterion 2; therefore, no additional sites have been screened in for further consideration on the basis of this criterion.

7.2 Marine Mammals – Identification of Potential Effects

7.2.1.1 This step identifies whether impacts of the Project (during construction, operation and maintenance, and decommissioning) described in **Chapter 4: Project Description** have the potential to result in LSE on the qualifying features of the European site identified for marine mammals.

7.2.1.2 Effect identification has been informed by the Sectoral Marine Plan for Offshore Wind Energy[100] and the Appropriate Assessment for Sectoral Marine Plan for Offshore Wind Energy[101], as well as industry experience and feedback received through the Scottish Ministers 2023 Project Scoping Opinion[31].

7.2.1.3 The main mechanisms by which the Project could affect European sites includes both direct and indirect impact pathways, as described in **Table 7-3**.

Table 7-3: Potential effect pathway during construction (C), operation and maintenance (O&M) and decommissioning (D) on marine mammals

Potential effect pathway	Project phase where potential effect pathway applies			ZoI	Justification
	C	O&M	D		
Underwater noise	Y	Y	Y	Extent of effect requires specific underwater noise modelling.	Underwater noise during construction activities includes piling and other installation activities (e.g. pin-piling, drilling, cutting, jetting, etc.), which may result in hearing damage/auditory injury or behavioural disturbance/displacement to marine mammals. Underwater noise during construction may affect the distribution of prey fish species with secondary effects on distribution and behaviour of marine mammals. Conservative assumption based on the possibility that prey species are hearing specialists (e.g. clupeids). Underwater noise resulting from the movement of mooring lines of operational WTGs within the water column (e.g. cable "snapping" or "pinging") may result in behavioural disturbance/displacement to marine mammal receptors. Clearance of UXO during the preconstruction phase will generate underwater noise with the potential to cause mortality, injury (PTS and TTS), behavioural impacts and temporary changes in the distribution of marine mammals. Geophysical and geotechnical surveys will generate underwater noise with the potential to cause mortality,

Potential effect pathway	Project phase where potential effect pathway applies			ZoI	Justification
	C	O&M	D		
					injury (PTS and TTS), behavioural impacts and changes in the distribution of marine mammals. The removal of offshore structures during decommissioning may generate underwater noise which is anticipated to be less than or equal in extent to those generated during construction activities. It is worth noting that decommissioning activities are unlikely to be percussive in nature and will not include any piling or pin-piling activities.
Vessel disturbance	Y	Y	Y	Within Project Area and transit routes.	Construction and operations and maintenance vessel activities have the potential to disturb and/or displace marine mammals whilst they are on and transiting to site[105]. Vessel-related impacts during the Decommissioning phase are considered similar and potentially less than those outlined in the construction phase. Vessel activities in the marine environment generate a variety of behavioural responses from marine mammals, from active evasive manoeuvring to bowriding. These differences often reflect individual behaviour at the time of interaction (e.g. travel, resting, foraging, socialising, nursing, etc.), and species or taxa-specific morphological and behavioural differences (i.e. potentially reflected by size and speed and whether positive or negative behavioural responses are more likely).

Potential effect pathway	Project phase where potential effect pathway applies			ZoI	Justification
	C	O&M	D		
					It is difficult to decouple whether disturbance is caused by the physical presence of the vessels, the underwater noise generated by them, or a combination of the two. Vessel-related disturbance to marine mammals is fairly spatially constrained, relative to the home ranges or migratory distances covered by the majority of species. Indeed, the physical presence of the vessel should only generate a response over distances within which the vessel could be sensed, such as visually or echolocation signal return distances. Underwater noise from vessels is expected to generate disturbance impacts over a greater distance than would be generated by physical presence, due to the propagation of low frequency sound in the marine environment and dedicated noise modelling will be undertaken which considers underwater noise from vessels.
Offshore vessel interaction with marine mammals resulting in injury/mortality	Y	Y	Y	Within Project Area and transit routes.	Vessel passage to and from the offshore windfarm during construction, operation and maintenance poses a minor risk of collision with mammals. The impacts during the Decommissioning phase are considered similar and potentially less than those outlined in the construction phase. Vessel activities, including transiting to and from site, will be restricted to the boundaries of the Project and along routes to local ports. The risk of an injury-inducing or fatal collision with a marine mammal is influenced by the echolocation of marine

Potential effect pathway	Project phase where potential effect pathway applies			ZoI	Justification
	C	O&M	D		
					mammals and vessels and whether those animals are exposed to vessels on a regular basis[106]. The increase in vessel traffic associated with the various phases of the Project is likely to be low compared to background levels, given the Array Area and ECC occur in regions utilised by various maritime industries (i.e. fishing, oil and gas, shipping, etc.). Indeed, the resident bottlenose dolphins associated with the CES MU encounter a wide variety of industrial and recreational vessels across their range without any records of injury or mortality from vessels. Avoidance behaviour by cetaceans is often associated with unpredictable boats transiting at higher speeds[107,108,109,110]. Slower vessels following a consistent trajectory allow marine mammals the opportunity to avoid collisions. The probability of collision is estimated to decrease to <50% when large vessels reduce speeds to 10 knots[111] and fatal collisions are more likely when vessels are transiting at higher speeds[112],[113]. Project vessels will be operating at slow speeds and many will be stationary (holding position) for construction and maintenance works, so the potential for collision is considered very limited. Moreover, any disturbance effects from vessel activities (as detailed above) would further reduce the potential for collision risk to bottlenose dolphins.
Changes to prey resources	Y	Y	Y	Localised temporary and spatially.	Fish which are key prey for marine mammals in the North Sea, including clupeids (e.g., herring), gadoids (e.g. cod and whiting), sandeels and flatfish species. Changes in the

Potential effect pathway	Project phase where potential effect pathway applies			ZoI	Justification
	C	O&M	D		
					distribution of prey fish species may result in secondary effects on the distribution and behaviour of marine mammals. Changes in marine mammal prey abundance and distribution could occur as a result of increased underwater noise levels, accidental release of pollutants or activities that disturb the seabed (i.e. generate increased SSCs and expose contaminants) during construction, operation and maintenance, and decommissioning. Potential impacts upon prey species may affect marine mammal foraging within the vicinity of the site boundary. Prey abundance and distribution may be influenced by other physical properties, such as EMF and heat. [13]Localised EMF created by electric current passing through subsea cables has the potential to disrupt the sensory mechanisms of electrosensitive species (e.g. elasmobranchs, etc.) by interfering with movement and behaviour. Interactions between mobile species, such as migratory fish, and areas of elevated temperature are likely to be very limited due to the highly constrained area of effect (within a couple of metres[114]) and the highly mobile nature of these species.
Accidental spills to the marine environment	Y	Y	Y	Within Project Area	Construction, operation and maintenance activities may result in accidental pollution release from vessels or machinery used by the Project. Pollution can affect sediment and water quality with subsequent implications for marine mammals and their prey.

Potential effect pathway	Project phase where potential effect pathway applies			ZoI	Justification
	C	O&M	D		
Potential changes to suspended sediment concentrations	Y	Y	Y	15 km (tidal excursion).	Water quality changes such as increased turbidity caused by seabed works may impact the ability of marine mammals to locate prey and may also impact fish prey species presence and distribution. The impacts during the Decommissioning phase are considered similar and potentially less than those outlined in the construction phase.
Subsea mooring systems may cause entanglement resulting in injury and/or mortality	N	N	N	Within Array Area	The potential for primary entanglement is negligible. This is due to the large diameter of the mooring lines and the weight of the lines preventing slack in the mooring lines. There is no evidence of primary entanglement at existing floating OWFs or from the oil and gas industry (from which the technology comes). Fishing gear has been identified as an entanglement risk for marine mammals[115] and it is possible that lost or abandoned fishing gear may get caught in the mooring lines, posing a risk to marine mammals from secondary entanglement. Though the scale of the proposed Array Area is large in comparison to floating oil and gas structures in the area (both in areal extent and number of lines), it is important to consider the amount and type of Abandoned, Lost or Discarded Fishing Gear (ALDFG) in the area rather than solely the scale of the

Potential effect pathway	Project phase where potential effect pathway applies			ZoI	Justification
	C	O&M	D		
					Array Area. The type of fishing activity in the surrounding ICES rectangles means that there is unlikely to be a significant amount of problematic ALDFG that could be snagged on the WTG moorings, therefore the Project is unlikely to substantially increase the risk of secondary entanglement. Fishing activity, within the ICES rectangle in which the Array Area sits (43F1), occurs at low levels and is dominated by demersal trawling for Nephrops. Low levels of demersal seine netting and pelagic trawling also take place. There is no reported gill or trammel netting with the ICES rectangles adjacent to the Array Area and lost nets from these fisheries are typically recovered in the location in which they were lost[116]. The risk of demersal trawl and seine nets being lost or fouled within the Array Area is exceptionally low due to the fact that these are weighted nets which would sink should they become ensnared. Pelagic trawl nets are unweighted, but the scale and material used in these nets still makes them heavy and it is not anticipated that they would remain within the water column for an extended period, should they be lost by a fishing vessel. Additionally, safety zones around project infrastructure will prohibit fishing vessels from occupying areas where interactions with the array infrastructure would occur. A Fisheries Liaison Officer (FLO) will allow engagement with

Potential effect pathway	Project phase where potential effect pathway applies			ZoI	Justification
	C	O&M	D		
					fishermen to record lost/snagged gear in relation to the Project. Early consultation and research conducted by the Natural Resources Defence Council (NRDC) indicate that marine debris is more likely to entangle at depths between 0-5 m below the sea surface[117]. In the semi-submersible design, the keel of the floating substructure will be submerged to approximately 10 – 20 m depth from where a chain will connect it to catenary mooring lines. This reduces the potential for entanglement at the top of the water column where it would pose the greatest risk of secondary entanglement. For the TLP design, the vertical angle and material of the mooring lines suggests it is likely that fouled ALDFG material would slide down the lines rather than remain in the water column. A build-up of marine debris at the bottom of the mooring lines is only likely for heavy fishing gear, such as demersal trawling nets, which would be too heavy to remain suspended in the water column, even when snagged on a mooring line. Marine debris accumulating at the seabed is less likely to ensnare baleen whales as they do not spend a large amount of time at the seabed. Species such as dolphins, seals

Potential effect pathway	Project phase where potential effect pathway applies			ZoI	Justification
	C	O&M	D		
					and porpoises will feed along the seabed, but are not found in large numbers in the Array Area. Fishing gear/debris that becomes wrapped around OWF infrastructure will have a reduced surface area and thus a reduced catch potential for fish. It is thus unlikely to attract marine mammals to feed on ensnared prey.
Presence of offshore structures creating a physical barrier effect	N	Y	N	Within Array Area	During the operation and maintenance phase the presence of the WTG infrastructure may cause a barrier effect for the marine mammals in the area. Marine mammals may be deflected from their normal routes.
Potential effects from EMF generated by cables	N	N	N	<10 m	Marine mammals are not known to possess specialist electro- or magneto-receptive organs. There is, however, evidence of magnetoreception in a range of cetacean species (e.g. humpback whales, bottlenose dolphin, harbour porpoise) meaning the B-field component of EMF can affect these species[118,119,120]. It is considered that many cetaceans and some pinnipeds use the Earth's GMF to navigate and particularly during long migrations, with implications that EMF may interfere with the navigational cues. Modelling conducted by Tricas and Gill[121] on bottlenose dolphins indicated that they could detect B-fields from a subsea cable up to 50 m away when directly above the cable, causing alteration to the direction of travel. However, as noted in Appendix 5F: Approach to EMF and heat as potential impacts of the 2024 Scoping Report[13], due to the high mobility

Potential effect pathway	Project phase where potential effect pathway applies			ZoI	Justification
	C	O&M	D		
					of marine mammal species and capability to move away from the EMF influence, it is not considered that they would experience long-term impacts.
Potential effects from heat generated by cables	N	N	N	<10 m	The impact from increased heat at cables will be extremely localised and will not directly impact marine mammal species due to their mobile and wide-ranging nature as noted in Appendix 5F: Approach to EMF and heat as potential impacts of the 2024 Scoping Report[13].

7.3 Marine Mammals - Determination of the Potential for Likely Significant Effects

7.3.1.1 The outcome of the process of identifying sites relevant to marine mammals as detailed in Section 7.1 is a 'long list' of designated sites and their relevant qualifying features. These sites and features are subject to consideration of the potential for LSE within this section of the report. This takes account of the identified potential effects for construction, operation and maintenance, and decommissioning phases of the Project as outlined in Section 7.2.

7.3.1.2 **Table 7-4** identifies the LSEs for the sites identified in **Table 7-2** and provides justification.

7.3.1.3 The assessment of LSE in the following sections is based on a series of matrices setting out whether LSE can be excluded for the relevant features of the European sites identified for each receptor. The matrices are presented in **Appendix B**.

7.3.1.4 The matrix approach adopted is based upon an approach set out within the Planning Inspectorate's Advice Note 10 on HRA[102] which relates to NSIPs. Although it is acknowledged that this guidance is not directly applicable to Scottish projects, the matrix approach used is considered to be a pragmatic approach and useful in defining the extent of impacts from the Array on identified designated sites' qualifying features, in relation to the sites' conservation objectives. It also provides a clear audit trail for agreement with the statutory consultees on the scope of the HRA and the features and impacts to be taken forward into the AA for each site.

Table 7-4: Determination of the potential for LSE on SACs with marine mammals as qualifying features for the Project

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
Moray Firth SAC	Bottlenose Dolphin	Underwater noise (C,O,D)	No project specific noise modelling has been undertaken for the Project to date, it will be undertaken for the EIA, but existing JNCC guidance for noise impacts in harbour porpoise SAC[122] indicates that disturbance impacts will occur approximately 15 km from the site for pin piling. Bottlenose dolphins were not observed in the Array Area during the DAS surveys or by Marine Management Organisation (MMO)/Passive Acoustic Monitoring (PAM) undertaken during the geophysical and environmental surveys of the Array Area and ECC (outwith 12 NM). However, the western portion of the ECC (within the 12 NM limits) overlaps with the bottlenose dolphin Coastal East Scotland (CES) Management Unit (MU). NatureScot consider any activity within the bottlenose dolphin CES MU as functionally linked with the Moray Firth SAC; therefore, activities with the potential to impact any individuals within this MU will be considered for LSE on bottlenose dolphins as qualifying features of this protected site. Underwater noise from pre-construction surveys and Unexploded Ordnance (UXO) clearance, as well as during percussive piling of the Offshore Substation Converter Platform (OSCP) and possibly the anchors, within the ECC can cause disturbance, injury and in extreme instances, mortality, to bottlenose dolphins. Based on project-specific survey data, the project does not anticipate requirements for extensive UXO clearance within the ECC. Moreover, any potential for injury or mortality will be suitably mitigated via best practice	**Yes**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			guidance for all activities. However, the project will seek to understand the potential for injury and mortality to occur, prior to the application of mitigations, via dedicated noise modelling. Moreover, disturbance related impacts may have disproportionate effects on small, resident populations, such as the bottlenose dolphins associated with the CES MU. Existing Joint Nature Conservation Committee (JNCC) guidance on noise management in harbour porpoise SACs[123] indicates that the effective deterrent radius for disturbance impacts will occur approximately 12 km from the site of seismic airgun arrays, 5 km from sub-bottom profilers and 26 km from the location of UXO detonation. However, due to species-specific differences in auditory sensitivities to noise frequencies, it is anticipated that disturbance related impacts to bottlenose dolphins from any such activities occurring within the ECC will vary, and this variation will be identified through dedicated underwater noise modelling and impacts will be characterised on both individual and population levels. Given the location assessment of survey area to date, it is considered that there won't be a significant amount of UXO in the Project Site[124]. Any such effects from underwater noise, if they do occur, may affect individuals and have impacts at the population level, therefore it is considered as potential LSE.	
		Vessel disturbance (C,O,D)	There is potential for bottlenose dolphins to be disturbed or displaced as a result of vessel activity. However, given the distance between the SAC and the Array Area, there is no potential LSE from activities within the Array Area	**Yes**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			due to the spatially constrained, residential nature of this small population of coastal bottlenose dolphins. Th ECC passes through the bottlenose dolphin CES MU. NatureScot considers any activity within the bottlenose dolphin MU as functionally linked. Therefore, potential LSE exists as a result of any activity within the coastal strip.	
		Offshore vessels interaction with marine mammals resulting in injury/mortality (C,O,D)	The extent of this potential disturbance will be restricted to within the boundaries of the Project and along routes to local ports. The risk of a collision is determined by the presence of marine mammals and vessels in the same area and whether those animals are exposed to vessels on a regular basis[125]. The increase in vessel traffic associated with the various phases of the Project is likely to be low compared to background levels, and likelihood of the impact occurring is low, and therefore there is little potential for the increased vessel activity during construction to result in a significant impact to bottlenose dolphin in terms of collision risk with vessels. Bottlenose dolphins were not observed in the Array Area during the DAS surveys or by Marine Management Organisation (MMO)/Passive Acoustic Monitoring (PAM) undertaken during the geophysical and environmental surveys of the Array Area and ECC (outwith 12 NM). Additionally, avoidance behaviour by cetaceans is often associated with unpredictable boats transiting at higher speeds[126,127,128,129]. Slower vessels following a consistent trajectory allow marine mammals the opportunity to avoid collisions. The probability of collision is estimated to decrease to <50% when large vessels reduce speeds to	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			10 knots[130] and fatal collisions are more likely when vessels are transiting at higher speeds[131,132]. As such, no LSEs are anticipated to occur to bottlenose dolphin qualifying features of any European site and the impact of vessel collision risk is therefore screened out of further consideration for bottlenose dolphin.	
		Changes to prey resources (C,O,D)	Bottlenose dolphins are opportunistic generalist predators and known prey species include a wide range of fish and shellfish taxa. Activities along the ECC which include to potential to effect fish populations will largely be limited to increases in suspended sediment concentrations (SSC) and mobilisation of contaminants from the installation and removal of the export/import cable during the construction and decommissioning phases of the project. These impacts will be temporary and highly localised in nature and are not likely to impact entire populations of species. EMF generated by the transmission and generation cabling infrastructure whilst operational will be highly constrained to within meters or tens of meters to the buried and floating cable infrastructure. All cables will be insulated and designed to minimise transmission loss (heat loss). Moreover, burial and/or protection further insulates against EMF and heat effects. Therefore, it is considered that the operational cables have limited potential to impact marine mammal prey availability and distribution which would result in changes to prey resources.	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			The potential for cable installation and decommissioning activities to result in important or lasting impacts to prey resources which would have a LSE on the bottlenose dolphin population associated with the Moray Firth SAC is considered negligible and is therefore screened out for further consideration for this site.	
		Accidental spills to the marine environment (C,O,D)	There is a risk of pollution being accidentally released from vessels and equipment involved during the construction phase of the Project. Pollution events are considered unlikely, and given the volumes associated with offshore windfarm developments, should an event occur, effects will be temporary, reversible and limited in spatial extent (e.g. due to the expected low volumes of pollutants associated with offshore wind developments). The risk of pollution events will be managed by the implementation of an Environmental Management Plan and Marine Pollution Contingency Plan. These plans will provide planning for accidental spills and address potential contaminant releases. All vessels to be used as part of any phase of the Project will adopt a waste management plan in line with the requirements set out as part of the International Convention for the Prevention of Pollution from Ships (MARPOL[133]) and the Shipboard Oil Pollution Emergency Plan (SOPEP). The site is also 94 km as a minimum away from the Project. Therefore, any direct effects should they occur will not directly affect the designated site.	**No**
		Potential changes to suspended	Sediment disturbance arising from construction, operation and maintenance and decommissioning	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
		sediment concentrations (C,O,D)	activities (e.g. anchoring and cable installation, and seabed preparation works) may result in temporary increases in SSC which can directly impact the foraging ability of marine mammals. Indirect effects may also occur as a result of impacts to prey species from SSC (these are considered under 'changes to prey availability' above). Bottlenose dolphins are adapted to, and tolerant of, turbid environments[134]. The localised and short-term nature of increases in SSC during the construction phase are unlikely to result in a significant effect on the foraging ability of this species.	
		Presence of offshore structures creating a physical barrier effect (O)	There is currently no evidence to indicate that a floating offshore windfarm could cause a barrier to movement for bottlenose dolphins or any other marine mammal species. A literature review conducted for Equinor on floating windfarms and potential barrier effects[135] , suggested that odontocetes can use echolocation for detecting undersea obstructions and showed avoidance behaviour. There are currently no first-hand accounts of that mooring lines can cause significant barrier effects[136] and it is therefore considered that moorings are unlikely to pose a major barrier threat to bottlenose dolphins. The wide spacing of (target of at least 1 km) between turbine structures at the surface and a minimum of 500 m between submarine structures will allow passage of marine mammals through the area unimpeded. There will be a maximum of nine mooring lines per WTG with a mooring radius of approximately 850 m. The footprint of these infrastructures is minimal compared to the available space within the Array Area, allowing mammals to travel through the area unaffected.	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			The Project Area is 282 km from the Moray Firth SAC given that bottlenose dolphin is a coastal species and not present within the Array Area or likely to be foraging in the Array Area there are unlikely to be any barrier effects.	
Berwickshire and North Northumberland Coast SAC	Grey seal	Underwater noise (C,O,D)	Five grey seals were recorded within the proposed Array Area in monthly aerial surveys conducted between 2021 – 2023 and three grey seals were recorded by MMO undertaken during the geophysical and environmental surveys of the Array Area and ECC (outwith 12 NM). Grey seals frequently travel over 100 km from their haul out site to forage, and may travel over 200 km between haul out sites, but remain within much closer proximity to haul outs during vulnerable periods, such as the breeding and moulting seasons[137]. The Berwickshire and North Northumberland Coast SAC offers terrestrial and coastal marine protection to grey seals which predominantly occupy this location during these vulnerable periods. Based on NatureScot's HRA Screening Response to other Scottish Offshore Windfarms (e.g. West of Orkney, Pentland, etc.) the project proposes a Zone of Influence of 20 km from the location of Scottish protected sites with grey seal qualifying features. However, advice received from Natural England, as captured in the Cenos 2023 Scoping Opinion, requested this site was considered further by the Project. Underwater noise from pre-construction surveys and UXO clearance, as well as during percussive piling of the OSCP and possibly the anchors, can cause disturbance, injury and in extreme instances, mortality, to grey seals. Based on project-specific survey data, the project does not	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			anticipate requirements for extensive UXO clearance. Moreover, any potential for injury or mortality will be suitably mitigated via best practice guidance for all activities. However, the Project will seek to understand the potential for injury and mortality to occur, prior to the application of mitigations, via dedicated noise modelling. Moreover, disturbance related impacts may have disproportionate effects on populations during vulnerable periods, such as breeding, pupping or moulting. Existing JNCC guidance on noise management in harbour porpoise SACs[138] indicates that the effective deterrent radius for disturbance impacts will occur approximately 12 km from the site of seismic airgun arrays, 5 km from sub-bottom profilers, 15 km for pin-piling and 26 km from the location of UXO detonation and monopile installation (without noise abatement). However, due to species-specific differences in auditory sensitivities to noise frequencies, it is anticipated that disturbance related impacts to grey seals from any such activities occurring within the ECC and Array Area will be reduced. The distances over which underwater noise would propagate are considered too great to have the potential to impact the population of grey seals protected by the Berwickshire and North Northumberland Coast SAC. The potential for noise-generating activities to result in a LSE on the grey seal population associated with the Berwickshire and North Northumberland Coast SAC is considered negligible and is therefore screened out for further consideration for this site.	
		Vessel disturbance	Given the distance of the SAC from the Project (169 km minimum from ECC and 228 km from Array), and that the	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
		(C,O,D)	local increase in vessel traffic from the Project is likely to be low when compared with existing vessel traffic around the east coast of Scotland, there is no potential for LSE.	
		Offshore vessels interaction with marine mammals resulting in injury/mortality (C,O,D)	The extent of this potential disturbance will be restricted to within the boundaries of the Project and along routes to local ports. The risk of a collision is determined by the presence of marine mammals and vessels in the same area and whether those animals are exposed to vessels on a regular basis[125]. As the increase in vessel traffic associated with the different phases of the Project is likely to be low compared to background levels, as well as the low number of grey seals recorded, the likelihood of the impact of collision risk occurring is considered to be low. Consequently, no LSE is anticipated to occur to grey seal, a qualifying feature of this European site and therefore collision risk is therefore screened out of further assessment.	**No**
		Changes to prey resources (C,O,D)	Effects on fish populations from underwater noise, SSC, mobilisation of contaminants and habitat disturbance are likely to be temporary, localised and short-term in nature and largely constrained to the installation and decommissioning phases of the project. There is potential that maintenance activities, as well as the movement of the dynamic mooring and cabling infrastructure along the seabed within the Array Area, could disturb the seabed in such a way as to alter habitat use by demersal fish and epibenthic shellfish prey species within this area. However, the footprint of these 'swept areas' is very small in comparison to the available habitat which support likely prey species.	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			EMF generated by the transmission and generation cabling infrastructure whilst operational will be highly constrained to within meters or tens of meters to the buried and floating cable infrastructure. All cables will be insulated and designed to minimise transmission loss (heat loss). Moreover, burial and/or protection further insulates against EMF and heat effects. Therefore, it is considered that the operational cables have limited potential to impact marine mammal prey availability and distribution which would result in changes to prey resources. Given the low numbers of grey seal recorded during site-specific surveys and the distance of the Project offshore, the Array Area is not likely to constitute an important foraging area. On this basis, no LSE is expected for grey seal due to changes in prey availability during all phases and this impact is screened out from further consideration for this site.	
		Accidental spills to the marine environment (C,O,D)	There is a risk of accidental spills from vessels and equipment involved during all phases of the Project. Pollution events are considered unlikely, and given the volumes associated with offshore windfarm developments, should an event occur, effects will be temporary, reversible, and limited in spatial extent (for instance, due to the expected low volumes of pollutants associated with offshore wind developments).	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			The risk of pollution events will be manged by the implementation of an Environmental Management Plan and Marine Pollution Contingency Plan, these plans will provide planning for accidental spills and address potential contaminant releases, they will adhere to best practice guidance produced by OSPAR[54], IMO and MARPOL[133]. The site is also 169 km (minimum) away from the Project. Therefore, effects should they occur will not directly affect the designated site. Any indirect effects from the accidental release of pollutants is considered unlikely and, should they occur, will be unlikely to lead to a significant effect on the conservation objectives of the site.	
		Potential changes to suspended sediment concentrations (C,O,D)	Sediment disturbance arising from construction, operation and maintenance, and decommissioning activities (e.g. anchoring and cable installation) may result in temporary increases in SSC which can directly impact the foraging ability of marine mammals. Indirect effects may also occur as a result of impacts to prey species from SSC (these are considered under 'changes to prey availability'). The extent of this impact will be spatially restricted to within the boundaries of the Project and the surrounding area. Grey seal frequently occur in turbid environments and are adapted to navigating and locating prey in such conditions[134]. The increases in SSC that may arise during the construction, operation and maintenance, and decommissioning phases will be temporary and unlikely to result in significant effects to the foraging ability of grey	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			seal. This impact is therefore screened out of further consideration for grey seal.	
		Presence of offshore structures creating a physical barrier effect (O)	There is currently no evidence to indicate that a floating offshore windfarm could cause a barrier to movement for grey seals or any other marine mammal species. A literature review conducted for Equinor on floating windfarms and potential barrier effects[135], cited several studies where marine mammals including harbour porpoise and grey seal were observed in the vicinity of operational fixed windfarms[139,140] and foraging around oil and gas platforms[141]. Given the large distance between the Array Area and the SAC (228 km) there is unlikely to be any LSE.	**No**
Southern North Sea SAC	Harbour porpoise	Underwater noise (C,O,D)	This site is 173 km from Project Array Area and 194 km from the ECC route. Based on monthly aerial surveys conducted 2021 – 2023, the most common marine mammal in the Project Area is the harbour porpoise (152 No. over entire survey period); although sightings numbers were considered low relative to other regions of the North Sea. Additionally, two suspected harbour porpoise were recorded by MMOs during the geophysical and environmental surveys of the Array Area and ECC (outwith 12 NM). Project specific underwater noise modelling has not yet been completed but will be completed in support of the EIAR and RIAA. Underwater noise from pre-construction surveys and UXO clearance, as well as during percussive piling of the OSCP and possibly the anchors, can cause disturbance, injury and in extreme instances, mortality, to harbour porpoise. Based on project-specific survey data,	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			the project does not anticipate requirements for extensive UXO clearance. Moreover, any potential for injury or mortality will be suitably mitigated via best practice guidance for all activities. However, the project will seek to understand the potential for injury and mortality to occur, prior to the application of mitigations, via dedicated noise modelling. Moreover, disturbance related impacts may have disproportionate effects on populations during vulnerable periods. Existing JNCC guidance on noise management in harbour porpoise SACs[138] indicates that the effective deterrent radius for disturbance impacts will occur approximately 12 km from the site of seismic airgun arrays, 5 km from sub-bottom profilers, 15 km for pin-piling and 26 km from the location of UXO detonation and monopile installation (without noise abatement). However, the project-specific zone of influence for these noise-generating activities will be determined through dedicated underwater noise modelling, and impacts will be characterised on both individual and population levels. The distances over which underwater noise would propagate are considered too great to have the potential to impact the population of harbour porpoises protected by the Southern North Sea SAC. Particularly, as the Project area does not form primary or preferred habitat to harbour porpoise in the North Sea MU, as supported by the low numbers of individuals recorded during the site-specific surveys. As such, there is limited scope for connectivity between the Project's noise generating activities and individuals associated with the Southern North Sea SAC.	

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
		Vessel disturbance (C,O,D)	Vessel activities, including transiting to and from site, will be restricted to the boundaries of the Project and along routes to local ports. Given the distance of the SAC from the Project (194 km from the ECC and 173 km from the Array), and that the local increase in vessel traffic from the Project is likely to be low when compared with existing vessel traffic around the east coast of Scotland, there is no potential for LSE.	**No**
		Offshore vessels interaction with marine mammals resulting in injury/mortality (C,O,D)	The risk of an injury-inducing or fatal collision with a marine mammal is influenced by the echolocation of marine mammals and vessels and whether those animals are exposed to vessels on a regular basis[125]. The increase in vessel traffic associated with the various phases of the Project is likely to be low compared to background levels, given the Array Area and ECC occur in regions utilised by various maritime industries (i.e. fishing, oil and gas, shipping, etc.). Indeed, harbour porpoise along the east coast of the UK encounter a wide variety of industrial and recreational vessels across their range and, as their name suggests, many temporarily occupy ports or harbours without issue. Avoidance behaviour exhibited by cetaceans is often associated with unpredictable boats transiting at higher speeds[142,143,144,145]. Slower vessels following a consistent trajectory allow marine mammals the opportunity to avoid collisions. The probability of collision is estimated to decrease to less than 50 percent when large vessels reduce speeds to 10 knots[146] and fatal collisions are more likely when vessels are transiting at higher speeds[147],[148]. Project vessels will be operating at slow speeds and many will be stationary (holding position) for construction, maintenance and decommissioning works, so the	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			potential for collision is considered very limited. Moreover, any disturbance effects from vessel activities (as detailed above) would further reduce the potential for collision risk to harbour porpoise. As such, no LSEs are anticipated to occur to harbour porpoise. The impact of vessel collision risk is therefore screened out of further consideration.	
		Changes to prey resources (C,O,D)	The Project area does not support the primary habitat or features which support prey populations relevant to harbour porpoise, which include waters shallower than 40 m in depth and sandy, course sediments. Rather, relatively few harbour porpoise have been seen within the Project area across survey months and years, indicating it does not offer stable or optimal foraging opportunities to the population of harbour porpoise associated with this site. Given the distance from the designated site boundary to the proposed Project it is not expected that there is scope for impacts to prey species for this population. For this reason, it is considered that the potential for project activities to result in changes to prey resources which could have a LSE on harbour porpoise as a qualifying feature of the Southern North Sea SAC is considered negligible and is therefore screened out for further consideration for this site.	**No**
		Accidental spills to the marine environment (C,O,D)	There is a risk of pollution being accidentally released from vessels and equipment involved during all phased of the Project. Pollution events are considered unlikely, and given the volumes associated with offshore windfarm developments, should an event occur, effects will be temporary, reversible and limited in spatial extent (for	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			instance, due to the expected low volumes of pollutants associated with offshore wind developments). The risk of pollution events will be manged by the implementation of an Environmental Management Plan and Marine Pollution Contingency Plan, these plans will provide planning for accidental spills and address potential contaminant releases, they will adhere to best practice guidance produced by OSPAR, IMO and MARPOL. The site is also 173 km (minimum) away from the Project. Therefore, any effects should they occur will not directly affect the designated site. Any indirect effects from the accidental release of pollutants is unlikely and should they occur will be unlikely to lead to a potential LSE effect on the conservation objectives of the site.	
		Potential changes to suspended sediment concentrations (C,O,D)	Harbour porpoise are well known to forage in tidal areas where water conditions are turbid and visibility conditions poor. For example, harbour porpoise in the UK have been documented foraging in areas with high tidal flows[149,150]; therefore, low light levels, turbid waters and suspended sediments are unlikely to adversely impact harbour porpoise foraging success. When the visual sensory systems of odontocetes are compromised, they sense the environment in other ways, primarily using echolocation to navigate and find food in darkness, for example. There is likely to be large natural variability in the SSC within the 15 km tidal range. No designated sites are found within this distance however marine mammals transiting through this area are likely to be tolerant of any	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			small-scale increases, such as those associated with all phases of the Project. This impact is therefore screened out of further consideration for harbour porpoise.	
		Presence of offshore structures creating a physical barrier effect (O)	There is currently no evidence to indicate that a floating offshore windfarm could cause a barrier to movement for marine mammal species. A literature review conducted for Equinor on floating windfarms and potential barrier effects[135], cited several studies where marine mammals including harbour porpoise and grey seal were observed in the vicinity of operational fixed windfarms, and foraging around oil and gas platforms[141] . The wide spacing of (target of at least 1 km) between turbine structures at the surface and a minimum of 500 m between submarine structures will allow passage of marine mammals through the area unimpeded. There will be a maximum of nine mooring lines per WTG with a mooring radius of approximately 850 m. The footprint of these infrastructures is minimal compared to the available space within the Array Area, allowing mammals to travel through the area unaffected. Given the large distance between the Array Area and the SAC (173 km) there is unlikely to be any LSE. This site is 173 km (minimum) from the Southern North Sea SAC and given the large foraging ranges for this species it is unlikely that barrier effects will have a LSE.	**No**
Transboundary harbour porpoise sites: Doggersbank SAC	Harbour porpoise	Underwater noise (C,O,D)	All other European sites designated for harbour porpoise are located over 200 km from the site boundary, and a significant effect is therefore considered unlikely.	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
Doggerbank SCI Klaverbank SAC Sydlige Nordsø SAC Gule Rev SAC Sylter Außenriff SCI SPA Ostliche Deutsche Bucht Vadehavet med Ribe Å, Tved Å og Varde Å vest for Varde SAC Borkum-Riffgrund SCI Store Rev SAC NTP S-H Wattenmeer und angrenzende Kustengebiete SAC Noordzeekustzone SAC Waddenzee SAC Nationalpark Niedersachsisches Wattenmeer SAC Skagens Gren og Skagerrak SAC Helgoland mit Helgolander Felssockel SAC Steingrund SAC Hamburgisches Wattenmeer SAC Kosterfjorden-Väderöfjorden SAC Unterelbe SAC			Based on monthly aerial surveys conducted 2021-2023, the most common marine mammal in the Project area is the harbour porpoise (152 No over entire survey period). No project specific noise modelling has been undertaken for the Project to date but existing JNCC guidance for noise impacts in harbour porpoise[122] indicates that disturbance impacts will occur approximately 15 km from the site for pin piling. Therefore, given the distance from the designated site boundary to the proposed Project it is not expected that there will be LSE for underwater noise impacts Consequently, all transboundary sites for harbour porpoise are screened out for this impact.	
		Vessel disturbance (C,O,D)	All other European sites designated for harbour porpoise are located over 200 km from the site boundary, and a significant effect is therefore considered unlikely. Consequently, all transboundary sites for harbour porpoise are screened out for this impact.	**No**
		Offshore vessels interaction with marine mammals resulting in injury/mortality (C,O,D)	All other European sites designated for harbour porpoise are located over 200 km from the site boundary, and therefore a significant effect is considered unlikely. Consequently, all transboundary sites for harbour porpoise are screened out for this impact.	**No**
		Changes to prey resources (C,O,D)	All other European sites designated for harbour porpoise are located over 200 km from the site boundary, and a LSE is considered unlikely. Therefore, all transboundary sites for harbour porpoise are screened out for this impact.	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
Voordelta Duinen Goeree & Kwade Hoek SAC Grevelingen SAC Oosterschelde Vlaamse Banken SAC Vlakte van de Raan SAC Vlakte van de Raan SCI Westerschelde & Saeftinghe SAC Bancs des Flandres SAC Recifs Gris-Nez Blanc-Nez SAC Ridens et dunes hydrauliques du détroit du Pas-de-Calais SAC Falaises du Cran aux Oeufs et du Cap Gris-Nez, Dunes du Chatelet, Marais de Tardinghen et Dunes de Wissant SAC Baie de Canche et couloir des trois estuaires SAC Baie de Seine occidentale SAC Baie de Seine orientale SAC		Accidental spills to the marine environment (C,O,D)	All other European sites designated for harbour porpoise are located over 200 km from the site boundary, and a LSE is considered unlikely. Therefore, all transboundary sites for harbour porpoise are screened out for this impact.	**No**
		Potential changes to suspended sediment concentrations (C,O,D)	All other European sites designated for harbour porpoise are located over 200 km from the site boundary, and a LSE is considered unlikely. Therefore, all transboundary sites for harbour porpoise are screened out for this impact.	**No**
		Presence of offshore structures creating a physical barrier effect (O)	There is currently no evidence to indicate that a floating offshore windfarm could cause a barrier to movement for marine mammal species. A literature review conducted for Equinor on floating windfarms and potential barrier effects[135], cited several studies where marine mammals including harbour porpoise and grey seal were observed in the vicinity of operational fixed windfarms[139,140] and foraging around Oil and Gas platforms. The wide spacing of (target of at least 1 km) between turbine structures at the surface and a minimum of 500 m between submarine structures will allow passage of marine mammals through the area unimpeded. There will be a maximum of 9 mooring lines per WTG with a mooring radius of approximately 850 m. The footprint of these infrastructures is minimal compared to the available space within the Array Area, allowing mammals to travel through the area unaffected.[141] The sites are 200 km (minimum) from the Project Area and given the large foraging ranges for this species and the alternative routes available, no LSE is expected.	**No**

8. OFFSHORE ORNITHOLOGY SCREENING

8.1 Offshore Ornithology Site Selection Criteria

8.1.1.1 The results of applying the criteria in **Table 3-1** to offshore ornithology and the relevant SPAs (and Ramsar sites) which have the potential to be affected by the Project (the Array Area and ECC) are as follows:

8.1.2 Criterion 1

8.1.2.1 With respect to the Array Area, there is no overlap with the location of the Project, or with the area in which potential effects from the Project could extend (e.g. displacement effects extending beyond the boundary of the Array Area) with SPA and/or Ramsar sites.

8.1.2.2 Part of the ECC is located within the Buchan Ness and Collieston Coast SPA.

8.1.3 Criterion 2

8.1.3.1 Criterion 2 determines seabird qualifying features that use the waters in and around the Project (e.g. for foraging) in the breeding season.

8.1.3.2 Breeding seabirds are central place foragers, meaning they make periodic and predictable feeding trips to and from a central place. For seabirds, the mean maximum foraging ranges (including one standard deviation) from. and Woodward *et al*[151] were used to identify SPA sites with breeding seabirds as qualifying features that may interact with the Project (see **Table 8-1**).

8.1.3.3 To determine those breeding colony SPAs that may have connectivity with the Project during the breeding season, all colony SPAs on the east, north (including Orkney and Shetland) and northwest coast of Scotland are considered on a case-by-case basis. Breeding seabird colony SPAs on the northeast and east coast of England that support features with large mean maximum foraging ranges (for instance fulmar, gannet) are also assessed in terms of whether they can be screened out.

8.1.3.4 In order to determine potential connectivity between the Project and a seabird breeding colony SPA, the mean-maximum foraging range (plus one standard deviation (SD)) is used as presented in **Table 8-1**. For some species, mean-maximum ranges are not available and mean ranges are given (for instance, Leach's storm-petrel (*Hydrobates leucorhous*) and Arctic skua (*Stercorarius parasiticus)*) while for other species no SD is given for the range (e.g. red-throated diver (*Gavia stellata*), European storm-petrel (*Hydrobates pelagicus*), black-headed gull (*Chroicocephalus ridibundus*), common gull (*Larus canus*), great black-backed gull (*Larus marinus*) and little tern (*Sternula albifrons*)).

8.1.3.5 On the basis that seabird foraging ranges are often extensive, SPAs from a wide geographical span including northern Scotland and northeast England are considered. This includes those in the Western Isles including St. Kilda SPA and Flamborough and Filey Coast in East Yorkshire. NatureScot have advised, within the Guidance Note 3, more extensive site or geography-specific foraging ranges for gannet, razorbill (*Alca torda*) and guillemot[152], as outlined in **Table 8-1**. This includes exceptions from Woodward *et al.* for the gannet qualifying features of Forth Islands SPA (590 km); St. Kilda SPA (709 km). For razorbill and guillemot, Guidance Note 3 advises exceptions of 164.6 km and 153.7 km respectively, for all Northern Isle SPAs (i.e. Shetland and Orkney).

Table 8-1: Mean maximum foraging ranges of breeding seabirds[79]

Species	Range (km) plus 1 SD
Herring gull (*Larus argentatus*)	85.6
Great black-backed gull	73
Lesser black-backed gull (*Larus fuscus*)	236
Kittiwake	300.6
Gannet	509.4/590 (Forth Islands SPA/709 (St. Kilda SPA)
Razorbill	122.2/164.6 (northern isles SPAs)
Guillemot	95.2/153.7 (northern isles SPAs)
Puffin (*Fratercula arctica*)	265.4
Eider (*Somateria mollissima*)	21.5
Red-throated diver	9
Fulmar	1,200
Manx shearwater (*Puffinus puffinus*)	2,365
European storm-petrel	336
Leach's storm-petrel	657
Cormorant (*Phalacrocorax carbo*)	33.9
Shag (*Phalacrocorax aristotelis*)	23.7
Arctic skua (*Parasitic jaeger*)	2.7
Great skua (*Stercorarius skua*)	931.2
Black-headed gull	18.5
Common gull	50
Common tern (*Sterna hirundo*)	26.9
Arctic tern (*Sterna paradisaea*)	40.5
Sandwich tern (*Thalasseus sandvicensis*)	57.5
Little tern	5

8.1.3.6 The process of applying foraging ranges through Criterion 2 has highlighted a series of sites that do not support any qualifying features whose foraging range overlaps with the Project. These sites are screened out of further assessment (for breeding seabirds) and include the following:

- Coquet Island;
- Firth of Tay and Eden Estuary;
- Pentland Firth Islands;
- Imperial Dock Lock, Leith;
- Inner Moray Firth;
- Cromarty Firth;
- Mousa;
- Papa Westray (North Hill and Holm);
- Papa Stour;
- Priest Island (Summer Isles); and

- Ramna Stacks and Gruney.

8.1.3.7 The distance between the Project's Array Area or ECC and a given SPA has been measured through the shortest straight-line distance not taking account of coastal land masses. Central place foraging seabirds will not move over land masses so the approach presented herein ins clear precautionary when determining likely connectivity.

8.1.3.8 **Table 8-2** summarises the breeding seabird SPAs identified as having potential connectivity with the Project's Array Area. Where species do not meet criterion two with respect to the Array Area but do so for the ECC, this is noted. Many SPAs include seabird assemblages as specific qualifying features. These are not listed in **Table 8-2** as screening focuses on individual species connectivity. Where seabird assemblages are present, they are detailed in the matrices provided in **Appendix B,** the links to the citation for these sites are contained within **Appendix A**.

Table 8-2: Breeding seabird SPAs meeting criterion 2

SPA	Distance to Array Area (km)	Distance to ECC (km)	Qualifying feature	Project Within foraging range	
				Array Area	ECC
Buchan Ness to Collieston Coast	186	0	Kittiwake	Y	Y
			Herring gull	N	Y
			Guillemot	N	Y
			Shag	N	Y
			Fulmar	Y	Y
Ythan Estuary, Sands of Forvie and Meikle Loch	190	5	Common tern	N	Y
			Little tern	N	Y
			Sandwich tern	N	Y
Loch of Strathbeg	195	16	Sandwich tern	N	Y
Troup, Pennan and Lion's Head	216	34	Kittiwake	Y	Y
			Herring gull	N	Y
			Guillemot	N	Y
			Razorbill	N	Y
			Fulmar	Y	Y
Fowlsheugh	210	61	Kittiwake	Y	Y
			Herring gull	N	Y
			Guillemot	N	Y
			Razorbill	N	Y
			Fulmar	Y	Y
East Caithness Cliffs	292	125	Fulmar	Y	Y
			Herring gull	N	N
			Great black-backed gull	N	N
			Shag	N	N

SPA	Distance to Array Area (km)	Distance to ECC (km)	Qualifying feature	Project Within foraging range	
				Array Area	ECC
			Cormorant	N	N
			Kittiwake	Y	Y
			Guillemot	N	Y
			Razorbill	N	Y
North Caithness Cliffs	299	142	Fulmar	Y	Y
			Kittiwake	Y	Y
			Guillemot	N	N
			Razorbill	N	N
			Puffin	N	Y
Forth Islands	251	145	Kittiwake	Y	Y
			Lesser black-backed gull	N	Y
			Herring gull	N	N
			Guillemot	N	N
			Razorbill	N	Y
			Puffin	Y	Y
			Gannet	Y	Y
			Shag	N	N
			Cormorant	N	N
			Arctic tern	N	N
			Common tern	N	N
			Roseate tern	N	N
			Sandwich tern	N	N
Copinsay	298	159	Fulmar	Y	Y
			Kittiwake	Y	Y
			Guillemot	N	N
			Great black-backed gull	N	N
Hoy	321	167	Great skua	Y	Y

SPA	Distance to Array Area (km)	Distance to ECC (km)	Qualifying feature	Project Within foraging range	
				Array Area	ECC
			Arctic skua	N	N
			Fulmar	Y	Y
			Red-throated diver	N	N
			Kittiwake	N	Y
			Great black-backed gull	N	N
			Guillemot	N	N
			Puffin	N	Y
St. Abb's Head to Fast Castle	245	170	Kittiwake	Y	Y
			Herring gull	N	N
			Guillemot	N	Y
			Razorbill	N	N
			Shag	N	N
Auskerry	305	173	European storm-petrel	Y	Y
			Arctic tern	N	N
Calf of Eday	324	195	Fulmar	Y	Y
			Kittiwake	N	Y
			Great black-backed gull	N	N
			Cormorant	N	N
			Guillemot	N	N
Rousay	332	197	Fulmar	Y	Y
			Kittiwake	N	Y
			Arctic skua	N	N
			Arctic tern	N	N
			Guillemot	N	N
Marwick Head	346	201	Kittiwake	N	Y
			Guillemot	N	N
Farne Islands	237	201	Herring gull	N	N

SPA	Distance to Array Area (km)	Distance to ECC (km)	Qualifying feature	Project Within foraging range	
				Array Area	ECC
			Guillemot	N	N
			Puffin	Y	Y
			Shag	N	N
			Cormorant	N	N
			Arctic tern	N	N
			Common tern	N	N
			Roseate tern	N	N
			Sandwich tern	N	N
West Westray	341	207	Fulmar	Y	Y
			Kittiwake	N	Y
			Arctic skua	N	N
			Arctic tern	N	N
			Razorbill	N	N
			Guillemot	N	N
Fair Isle	303	212	Fulmar	Y	Y
			Kittiwake	N	Y
			Arctic tern	N	N
			Great skua	Y	Y
			Arctic skua	N	N
			Gannet	Y	Y
			Shag	N	N
			Guillemot	N	N
			Razorbill	N	N
			Puffin	N	Y
Cape Wrath	395	218	Fulmar	Y	Y
			Kittiwake	N	Y
			Puffin	N	Y

SPA	Distance to Array Area (km)	Distance to ECC (km)	Qualifying feature	Project Within foraging range	
				Array Area	ECC
			Razorbill	N	N
			Guillemot	N	N
Handa	407	223	Fulmar	Y	Y
			Kittiwake	N	Y
			Great skua	Y	Y
			Razorbill	N	N
			Guillemot	N	N
Sule Skerry and Sule Stack	394	234	Leach's storm-petrel	Y	Y
			European storm-petrel	N	Y
			Gannet	Y	Y
			Shag	N	N
			Guillemot	N	N
			Puffin	N	Y
Sumburgh Head	326	250	Fulmar	Y	Y
			Kittiwake	N	Y
			Arctic tern	N	N
			Guillemot	N	N
Shiant Isles	461	273	Fulmar	Y	Y
			Shag	N	N
			Kittiwake	N	Y
			Puffin	N	N
			Razorbill	N	N
			Guillemot	N	N
Foula	373	281	Fulmar	Y	Y
			Red-throated diver	N	N
			Leach's storm-petrel	Y	Y
			Shag	N	N

SPA	Distance to Array Area (km)	Distance to ECC (km)	Qualifying feature	Project Within foraging range	
				Array Area	ECC
			Kittiwake	N	Y
			Arctic skua	N	N
			Great skua	Y	Y
			Arctic tern	N	N
			Guillemot	N	N
			Razorbill	N	N
Noss	347	282	Great skua	Y	Y
			Kittiwake	N	Y
			Gannet	Y	Y
			Guillemot	N	N
			Puffin	N	N
			Fulmar	Y	Y
North Rona and Sula Sgeir	468	297	European storm-petrel	N	Y
			Leach's storm-petrel	Y	Y
			Gannet	Y	Y
			Guillemot	N	N
			Fulmar	Y	Y
			Kittiwake	N	Y
			Puffin	N	N
			Razorbill	N	N
			Great black-backed gull	N	N
Ronas Hill – North Roe and Tingon	398	325	Red-throated diver	N	N
			Great skua	Y	Y
Fetlar	387	330	Arctic skua	N	N
			Great skua	Y	Y
			Arctic tern	N	N
			Fulmar	Y	Y

SPA	Distance to Array Area (km)	Distance to ECC (km)	Qualifying feature	Project Within foraging range	
				Array Area	ECC
Flamborough & Filey Coast	325	345	Gannet	Y	Y
			Kittiwake	N	N
			Razorbill	N	N
			Guillemot	N	N
Hermaness, Saxa Vord and Valla Field	409	350	Red-throated diver	N	N
			Kittiwake	N	N
			Fulmar	Y	Y
			Gannet	Y	Y
			Great skua	Y	Y
			Guillemot	N	N
			Puffin	N	N
			Shag	N	N
Flannan Isles	540	352	Fulmar	Y	Y
			Leach's storm-petrel	Y	Y
			Kittiwake	N	N
			Puffin	N	N
			Razorbill	N	N
			Guillemot	N	N
St. Kilda	588	399	Fulmar	Y	Y
			Manx shearwater	Y	Y
			Leach's storm-petrel	Y	Y
			European storm-petrel	N	N
			Kittiwake	N	N
			Great skua	Y	Y
			Gannet	Y	Y
			Puffin	N	N
			Razorbill	N	N

SPA	Distance to Array Area (km)	Distance to ECC (km)	Qualifying feature	Project Within foraging range	
				Array Area	ECC
			Guillemot	N	N
Mingulay and Berneray	540	356	Razorbill	N	N
			Guillemot	N	N
			Puffin	N	N
			Fulmar	Y	Y
			Shag	N	N
			Kittiwake	N	N
Ailsa Craig	442	315	Herring gull	N	N
			Lesser black-backed gull	N	N
			Gannet	Y	Y
			Kittiwake	N	N
			Guillemot	N	N

8.1.3.9 Criterion 2 also considers designated functionally linked habitat for marine SPAs in accordance with NatureScot Guidance Note 4. As stated within the guidance note, a maximum theoretical connectivity distance of 15 km is advised for the majority of ornithological features with the exception wintering gulls, whereby the recommended breeding foraging ranges in Woodward *et al*.[79] are instead advised. No named designated functionally linked habitat for offshore ornithology qualifying features were found to have connectivity; therefore, no sites were screened in for consideration.

8.1.3.10 Initial consideration has been given to site specific DAS data collected including frequency and abundance of records. Based on these results the following qualifying features of designated sites were excluded from further consideration of LSE:

- Manx shearwater;
- European storm-petrel; and
- Leach's storm-petrel.

8.1.3.11 None of the above species were recorded in the two years of site-specific DAS. While they are noted as being in foraging range from some designated sites (**Table 8-2)**, none of them are in the region of the Project. Any potential impact can therefore confidently be ruled out.

8.1.4 Criterion 3

8.1.4.1 Includes qualifying features which may fly through the area of the Project during migration or in the non-breeding season. This includes two discrete components with respect to bird species and their respective SPAs/Ramsar sites:

- Waterbird species which have the potential to pass through the Projects Array Area on their twice annual migratory flights; and
- Seabirds in the non-breeding season that may be present at the Project.

Migratory Waterbird SPAs/Ramsar Sites

8.1.4.2 The east Scottish coast has a number of areas classified as SPAs for their intertidal non-breeding bird species. Those birds may migrate across the North Sea, potentially to European stop-over points, to more northerly or easterly breeding grounds.

8.1.4.3 To identify potential connectivity with sites designated for migratory waterbird species, consideration has been given to likely migratory pathways and distribution of coastal estuarine/inland waterbody SPAs/Ramsar sites on the north and east coast of Scotland[131]. There is potential for the Project to have connectivity with several sites. As such, sites with migratory waterbird features that are located within the following coastal Natural Heritage Zones (NHZs) are taken forward for LSE screening and listed in **Table 8-3**, the links to the citation for these sites are contained within **Appendix A**:

- North Caithness and Orkney;
- The Peatlands of Caithness and Sutherland;
- Moray Firth;
- Northeast Coastal Plain; and
- Eastern Lowlands.

8.1.4.4 The NHZs are an established biogeographical regional classification used by NatureScot and capture a suite of SPAs for designated migratory waterbirds. The identification of such species has been supported by information on migratory routes contained in a number of publications including the Migration Atlas[153], the SOSS-05 report for The Crown Estate[154] and the assessment for MD-LOT of the collision risk to migrating birds[155].

8.1.4.5 Table 8-3 excludes Shiant Isles SPA which in addition to supporting breeding seabird qualifying features, also supports Greenland Barnacle goose as a migratory waterbird qualifying feature. This population of barnacle goose has no potential to interact with the Project[150].

Table 8-3: Migratory waterbirds SPAs and distance to Array Area and ECC (km)

SPA/Ramsar	Distance to Array Area (km)	Distance to ECC (km)	Relevant qualifying features
Loch of Strathbeg	195	1	Barnacle goose (Svalbard) Pink-footed goose Greylag goose Whooper swan Goldeneye Teal
Ythan Estuary, Sands of Forvie and Meikle Loch	190	5	Pink-footed goose Eider Redshank Lapwing
Loch of Skene	220	46	Greylag goose Goldeneye Goosander
Cameron Reservoir	266	143	Pink-footed goose
Montrose Basin	232	91	Pink-footed goose Greylag goose Redshank Oystercatcher Eider Wigeon Knot Dunlin Shelduck
Moray Firth	282	94	Great northern diver Red-throated diver Slavonian grebe Scaup Eider Long-tailed duck Common scoter Velvet scoter Goldeneye Red-breasted merganser Shag
Firth of Tay and Eden Estuary	252	121	Bar-tailed godwit Redshank Greylag goose Pink-footed goose Velvet scoter Shelduck

SPA/Ramsar	Distance to Array Area (km)	Distance to ECC (km)	Relevant qualifying features
			Eider Common scoter Black-tailed godwit Goldeneye Red-breasted merganser Goosander Oystercatcher Grey plover Sanderling Dunlin Long-tailed duck
Firth of Forth	252	139	Red-throated diver Slavonian grebe Golden plover Bar-tailed godwit Pink-footed goose Shelduck Knot Redshank Turnstone Scaup Great crested grebe Cormorant Curlew Eider Long-tailed duck Common scoter Velvet scoter Goldeneye Red-breasted merganser Oystercatcher Ringed plover Grey plover Dunlin Mallard Lapwing Wigeon
Moray and Nairn Coast	269	80	Bar-tailed godwit Pink-footed goose Greylag goose Redshank Red-breasted merganser Dunlin Oystercatcher Wigeon
Loch of Kinnordy	266	114	Greylag goose Pink-footed goose
Greenlaw Moor	272	195	Pink-footed goose

SPA/Ramsar	Distance to Array Area (km)	Distance to ECC (km)	Relevant qualifying features
Din Moss – Hoselaw Loch	276	210	Greylag goose Pink-footed goose
Loch Spynie	280	92	Greylag goose
Caithness Lochs	303	141	Whooper swan Greenland white-fronted goose Greylag goose
Loch Leven	299	167	Whooper swan Pink-footed goose Shoveler Cormorant Gadwall Teal Pochard Tufted duck Goldeneye
South Tayside Goose Roosts	306	162	Wigeon Pink-footed goose Greylag goose
Dornoch Firth and Loch Fleet	314	127	Bar-tailed godwit Greylag goose Wigeon Curlew Teal Scaup Redshank Dunlin Oystercatcher
East Sanday Coast	316	192	Bar-tailed godwit Purple sandpiper Turnstone
Loch Ashie	336	149	Slavonian grebe
Inner Moray Firth	318	129	Greylag goose Red-breasted merganser Redshank Bar-tailed godwit
Loch Eye	322	134	Whooper swan Greylag goose
Cromarty Firth	324	136	Whooper swan Bar-tailed godwit Greylag goose Redshank Curlew Red-breasted merganser Scaup Pintail Wigeon Dunlin Oystercatcher

Seabirds – Non-breeding Season

8.1.4.6 Criterion 3 further seeks to identify European sites that although are outside of the Project Area, whose features have the potential to pass through or visit during the non-breeding season. This involves seabirds that migrate north, south, east, or west through the northern North Sea.

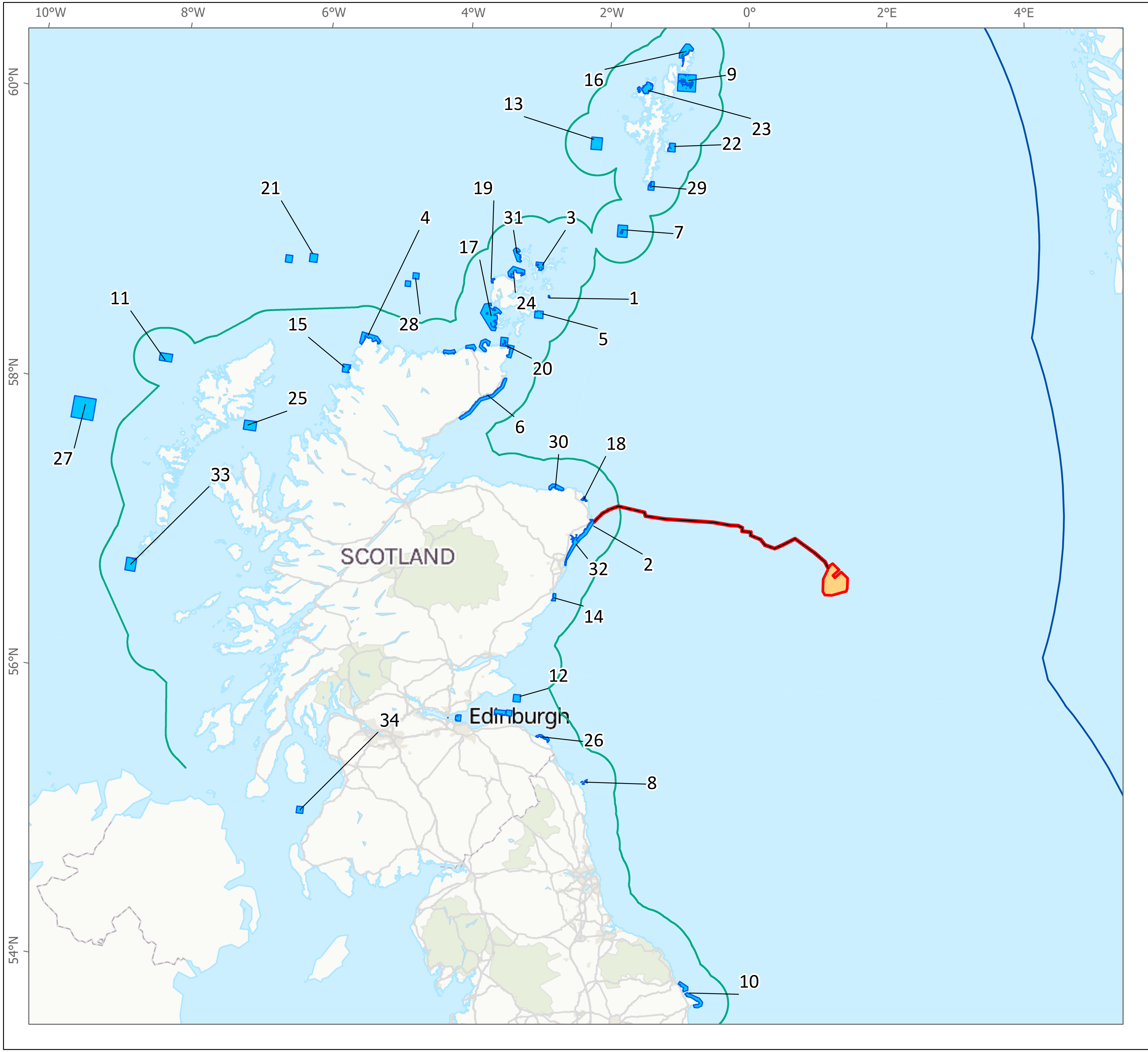
8.1.4.7 Seabird qualifying features in the non-breeding season are not constrained by a nesting site, and in the case of most seabird species, are distributed more widely offshore. In theory, this means that there is potentially a greater range of features from the breeding colony SPAs that may be impacted by the Project during the non-breeding season than during the breeding season.

8.1.4.8 MD-LOT and NatureScot have advised[156] that consideration of the potential for non-breeding season effects should be based upon the BDMPS approach[36.] For most seabird species, there are two general BDMPS regions defined within UK waters, the main division being between the North Sea and western waters. For some species, however, there are up to five BDMPS regions[36.] For reference, the project lies within the area defined as North Sea (and English Channel where appropriate) in Furness[36.]An exception to the approach described above has been undertaken for guillemot, as suggested within the NatureScot Guidance Note 4[156]. Recent studies show that guillemot largely remain in the broad vicinity of their breeding colonies during the non-breeding season[157], therefore a screening approach based on breeding population found within the foraging range of the development has been undertaken.

Summary of Selected Sites – Ornithology

8.1.4.9 The identification of connectivity to breeding seabird colonies has led to the identification of a 'long list' of 33 SPAs that are taken forward for consideration of LSEs. This includes those where potential connectivity in the non-breeding season has been identified. An additional 20 SPAs are taken forward due to connectivity for migratory waterbirds. These sites are also shown in the following figures:

- **Figure 8-1** - Breeding seabird SPAs identified under criterion two; and
- **Figure 8-2** - Wintering and migratory waterbird SPAS identified under criterion 3.



LEGEND

- Array Area
- Proposed Export/Import Cable Corridor
- Project Area
- 12 NM Boundary
- 200 NM Boundary
- SPAs

1 - Auskerry
2 - Buchan Ness
3 - Calf of Eday
4 - Cape Wrath
5 - Copinsay
6 - East Caithness Cliffs
7 - Fair Isle
8 - Farne Islands
9 - Fetlar
10 - Flamborough and Filey
11 - Flannan Isles
12 - Forth Islands
13 - Foula
14 - Fowlsheugh
15 - Handa
16 - Hermaness
17 - Hoy
18 - Loch of Strathbeg
19 - Marwick Head
20 - North Caithness Cliffs
21 - North Rona and Sula Sgeir
22 - Noss
23 - Ronas Hill
24 - Rousay
25 - Shiant Isles
26 - St Abb's Head to Fast Castle
27 - St Kilda
28 - Sule Skerry and Sule Stack
29 - Sumburgh Head
30 - Troup, Pennan
31 - West Westray
32 - Ythan Estuary
33 - Mingulay and Berneray
34 - Ailsa Craig

0 100
Kilometres

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PROJECT: Cenos Offshore Windfarm

TITLE: Figure 8-1 Breeding seabird SPAs identified under criterion two

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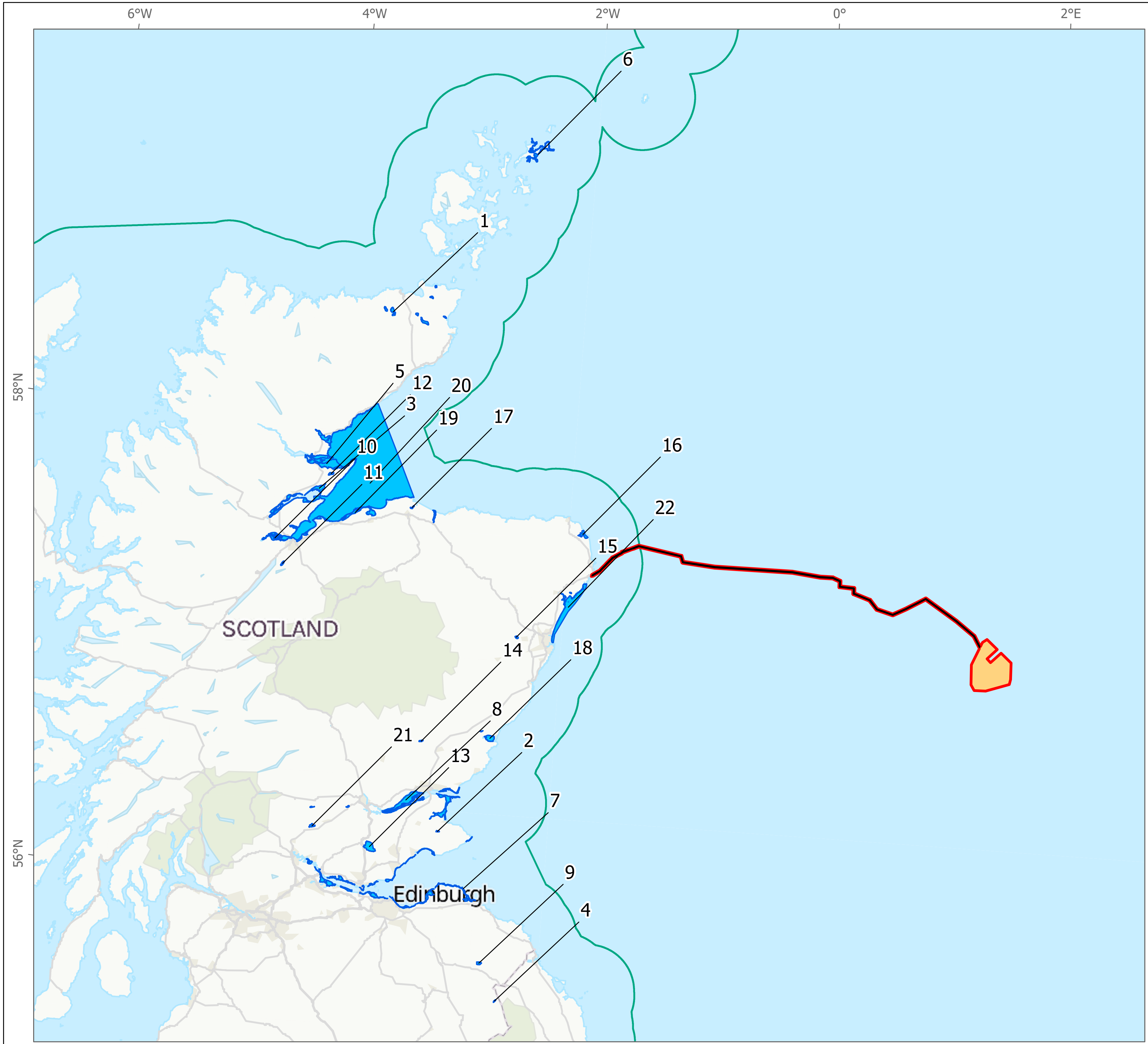

LEGEND

- Array Area
- Proposed Export/Import Cable Corridor
- Project Area
- 12 NM Boundary
- SPAs/Ramsar Sites

1 - Caithness Lochs	12 - Loch Eye
2 - Cameron Reservoir	13 - Loch Leven
3 - Cromarty Firth	14 - Loch of Kinnordy
4 - Din Moss - Hoselaw Loch	15 - Loch of Skene
5 - Dornoch Firth and Loch Fleet	16 - Loch of Strathbeg
6 - East Sanday Coast	17 - Loch Spynie
7 - Firth of Forth	18 - Montrose Basin
8 - Firth of Tay and Eden Estuary	19 - Moray and Nairn Coast
9 - Greenlaw Moor	20 - Moray Firth
10 - Inner Moray Firth	21 - South Tayside Goose Roosts
11 - Loch Ashie	22 - Ythan Estuary

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Kilometres

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PROJECT: Cenos Offshore Windfarm

TITLE: Figure 8-2 Wintering and migratory waterbird SPA and Ramsar sites identified under criterion three

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Table 8-4: European sites with designated ornithological species or habitats taken forwards for determination of LSE

Figure ID	Designated site	Range from Array boundary (km)	Range from ECC (MHWS-seawards) (km)	Relevant qualifying feature highlighted through site selection[2]	Criterion
Figure 8-1 Breeding Birds					
2	Buchan Ness to Collieston Coast	186	0	Kittiwake Herring gull* Guillemot Shag Fulmar Seabird assemblage	1/3 1/3 1/3 1 1/3 1/3
18	Loch of Strathbeg	195	16	Sandwich tern	2
32	Ythan Estuary, Sands of Forvie and Meikle Loch	190	5	Common tern Little tern Sandwich tern	2 2 2
14	Fowlsheugh	210	61	Kittiwake Herring gull Guillemot Razorbill Fulmar	2/3 2/3 2/3 2/3 2/3
30	Troup, Pennan and Lion's Head	216	34	Kittiwake Herring gull Guillemot Razorbill Fulmar	2/3 2/3 2/3 2/3 1/3
8	Farne Islands	237	201	Puffin	2/3
26	St. Abb's Head to Fast Castle	245	170	Kittiwake	2/3
12	Forth Islands	251	145	Kittiwake Lesser black-backed gull Razorbill	2/3 2/3 2/3

[2] NB – features assessed for LSE in the non-breeding season.

Figure ID	Designated site	Range from		Relevant qualifying feature highlighted through site selection[2]	Criterion
		Array boundary (km)	ECC (MHWS-seawards) (km)		
				Puffin Gannet Seabird assemblage	2/3 2/3 2/3
6	East Caithness Cliffs	292	125	Fulmar Great black-backed gull Kittiwake Guillemot Razorbill Seabird assemblage	2/3 3 2/3 2/3 2/3 2/3
5	Copinsay	298	159	Fulmar Kittiwake Razorbill Seabird assemblage	2/3 2/3 3 2/3
20	North Caithness Cliffs	299	142	Fulmar Kittiwake Razorbill Puffin Seabird assemblage	2/3 2/3 3 2/3 2/3
7	Fair Isle	303	212	Fulmar Kittiwake Great skua Gannet Puffin Seabird assemblage	2/3 2/3 2/3 2/3 2/3 2/3
17	Hoy	321	167	Great skua Fulmar Kittiwake Razorbill Puffin Great black-backed gull Seabird assemblage	2 2/3 2/3 3 2/3 3 2/3

<table>
<tr><th rowspan="2">Figure ID</th><th rowspan="2">Designated site</th><th colspan="2">Range from</th><th rowspan="2">Relevant qualifying feature highlighted through site selection[2]</th><th rowspan="2">Criterion</th></tr>
<tr><th>Array boundary (km)</th><th>ECC (MHWS-seawards) (km)</th></tr>
<tr><td>3</td><td>Calf of Eday</td><td>324</td><td>195</td><td>Fulmar
Kittiwake</td><td>2/3
2/3</td></tr>
<tr><td>29</td><td>Sumburgh Head</td><td>326</td><td>250</td><td>Fulmar
Kittiwake
Seabird assemblage</td><td>2/3
2/3
2/3</td></tr>
<tr><td>10</td><td>Flamborough & Filey Coast</td><td>325</td><td>345</td><td>Gannet
Seabird assemblage</td><td>2/3
2/3</td></tr>
<tr><td>24</td><td>Rousay</td><td>332</td><td>197</td><td>Fulmar
Kittiwake
Arctic skua
Guillemot
Seabird assemblage</td><td>2/3
2/3
3
3
2/3</td></tr>
<tr><td>31</td><td>West Westray</td><td>341</td><td>207</td><td>Fulmar
Kittiwake
Seabird assemblage</td><td>2/3
2/3
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Kittiwake
Gannet
Puffin
Fulmar
Seabird assemblage</td><td>2/3
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Kittiwake
Arctic skua
Great skua
Razorbill
Puffin
Seabird assemblage</td><td>2/3
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2/3
3
3
2/3</td></tr>
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Great skua
Fulmar</td><td>3
2/3
2/3</td></tr>
</table>

Figure ID	Designated site	Range from		Relevant qualifying feature highlighted through site selection[2]	Criterion
		Array boundary (km)	ECC (MHWS-seawards) (km)		
				Seabird assemblage	2/3
4	Cape Wrath	395	218	Fulmar Kittiwake Puffin Seabird assemblage	2/3 2/3 2/3 2/3
21	North Rona and Sula Sgeir	468	297	Gannet Kittiwake Fulmar Seabird assemblage	2/3 2/3 2/3 2/3
23	Ronas Hill – North Roe and Tingon	398	325	Great skua	2/3
15	Handa	407	223	Kittiwake Fulmar Great skua Seabird assemblage	2/3 2/3 2/3 2/3
16	Hermaness, Saxa Vord and Valla Field	409	350	Fulmar Kittiwake Gannet Great skua Puffin Seabird assemblage	2/3 3 2/3 2/3 3 2/3
25	Shiant Isles	461	273	Fulmar Kittiwake Seabird assemblage	2/3 2/3 2/3
28	Sule Skerry and Sule Stack	394	234	Gannet Puffin Seabird assemblage	2/3 2/3 2/3
11	Flannan Isles	540	352	Fulmar Seabird assemblage	2/3 2/3
27	St. Kilda	588	399	Fulmar	2/3

Figure ID	Designated site	Range from		Relevant qualifying feature highlighted through site selection[2]	Criterion
		Array boundary (km)	ECC (MHWS-seawards) (km)		
				Great skua Gannet Seabird assemblage	2/3 2/3 2/3
33	Mingulay and Berneray	540	356	Fulmar Seabird assemblage	2/3 2/3
34	Ailsa Craig	442	315	Gannet Seabird assemblage	2/3 2/3
Figure 8-2 Migratory Waterbirds					
16	Loch of Strathbeg	195	16	Barnacle goose (Svalbard) Pink-footed goose Greylag goose Whooper swan Goldeneye Teal	3
22	Ythan Estuary, Sands of Forvie and Meikle Loch	190	5	Pink-footed goose Eider Redshank Lapwing	3
15	Loch of Skene	220	46	Greylag goose Goldeneye Goosander	3
2	Cameron Reservoir	266	143	Pink-footed goose	3
18	Montrose Basin	232	91	Pink-footed goose Greylag goose Redshank Oystercatcher Eider Wigeon Knot Dunlin Shelduck	3

Figure ID	Designated site	Range from		Relevant qualifying feature highlighted through site selection[2]	Criterion
		Array boundary (km)	ECC (MHWS-seawards) (km)		
20	Moray Firth	282	94	Great northern diver Red-throated diver Slavonian grebe Scaup Eider Long-tailed duck Common scoter Velvet scoter Goldeneye Red-breasted merganser Shag	3
8	Firth of Tay and Eden Estuary	252	121	Bar-tailed godwit Redshank Greylag goose Pink-footed goose Velvet scoter Shelduck Eider Common scoter Black-tailed godwit Goldeneye Red-breasted merganser Goosander Oystercatcher Grey plover Sanderling Dunlin Long-tailed duck	3
7	Firth of Forth	252	139	Red-throated diver Slavonian grebe Golden plover Bar-tailed godwit	3

Figure ID	Designated site	Range from		Relevant qualifying feature highlighted through site selection[2]	Criterion
		Array boundary (km)	ECC (MHWS-seawards) (km)		
				Pink-footed goose Shelduck Knot Redshank Turnstone Scaup Great crested grebe Cormorant Curlew Eider Long-tailed duck Common scoter Velvet scoter Goldeneye Red-breasted merganser Oystercatcher Ringed plover Grey plover Dunlin Mallard Lapwing Wigeon	
19	Moray and Nairn Coast	269	80	Bar-tailed godwit Pink-footed goose Greylag goose Redshank Red-breasted merganser Dunlin Oystercatcher Wigeon	3
14	Loch of Kinnordy	266	114	Greylag goose Pink-footed goose	3

Figure ID	Designated site	Range from		Relevant qualifying feature highlighted through site selection[2]	Criterion
		Array boundary (km)	ECC (MHWS-seawards) (km)		
9	Greenlaw Moor	272	195	Pink-footed goose	3
4	Din Moss – Hoselaw Loch	276	210	Greylag goose Pink-footed goose	3
17	Loch Spynie	280	92	Greylag goose	3
1	Caithness Lochs	303	141	Whooper swan Greenland white-fronted goose Greylag goose	3
13	Loch Leven	299	167	Whooper swan Pink-footed goose Shoveler Cormorant Gadwall Teal Pochard Tufted duck Goldeneye	3
21	South Tayside Goose Roosts	306	162	Wigeon Pink-footed goose Greylag goose	3
5	Dornoch Firth and Loch Fleet	314	127	Bar-tailed godwit Greylag goose Wigeon Curlew Teal Scaup Redshank Dunlin Oystercatcher	3
6	East Sanday Coast	316	192	Bar-tailed godwit Purple sandpiper Turnstone	3

Figure ID	Designated site	Range from		Relevant qualifying feature highlighted through site selection[2]	Criterion
		Array boundary (km)	ECC (MHWS-seawards) (km)		
11	Loch Ashie	336	149	Slavonian grebe	3
10	Inner Moray Firth	318	129	Greylag goose Red-breasted merganser Redshank Bar-tailed godwit	3
12	Loch Eye	322	134	Whooper swan Greylag goose	3
3	Cromarty Firth	324	136	Whooper swan Bar-tailed godwit Greylag goose Redshank Curlew Red-breasted merganser Scaup Pintail Wigeon Dunlin Oystercatcher	3

8.2 Offshore Ornithology - Identification of Potential Effects

8.2.1.1 This step identifies whether impacts of the Project (during construction, operation and maintenance, and decommissioning) described in **Chapter 4: Project Description** have the potential to result in LSE on the qualifying features of these European sites.

8.2.1.2 Effect identification has been informed by NatureScot Guidance Notes 6[158] 7[159] and 8[160] in addition to feedback received from the Marine Directorate, on behalf of the Scottish Ministers, in the 2023 Scoping Opinion for Cenos[31].

8.2.1.3 The main mechanisms by which the Project could affect European sites are through either direct or indirect impact pathways, as described in **Table 8-5**.

Table 8-5: Potential effect pathways during construction (C), operation and maintenance (O&M) and decommissioning (D) on offshore ornithology

Potential effect pathway	Project phase where potential effect pathway applies			ZoI	Justification
	C	O&M	D		
Direct disturbance from vessels	Y	Y	Y	Up to 4 km from Project Area	There may be temporary disturbance and displacement effects to ornithological receptors due to the presence of vessels. However, these are expected to be localised and temporary in nature.
Distributional responses	N	Y	N	Up to 4 km from Project Area	Presence of WTGs can lead to distributional responses through displacement and barrier effects, effectively reducing the potential for birds to be present within the Project Area and increasing potential for longer flight paths and higher energy expenditure.
Changes in prey availability and behaviour	Y	Y	Y	Up to 100 km	The presence of the Project has the potential to influence prey availability and therefore decrease foraging efficiency of ornithological receptors.
Collision risk	N	Y	N	Within Array Area (rotor swept area)	There is potential for the presence of WTGs to lead to direct mortality of ornithological receptors while in flight through collision with turbine blades.
Underwater noise	N	N	N	Immediate vicinity of noisy construction activities	There is potential for diving birds (e.g. guillemot and gannet) to be present in the vicinity of the Project when noisy activities are occurring during construction (e.g. pile driving). It is likely birds will be aware of construction activities when they are not diving and may have been temporarily displaced. Although some species (e.g. cormorant) may be better adapted to hear underwater than other species[161], it is assumed that most diving birds do not have the same capacity to hear underwater

Potential effect pathway	Project phase where potential effect pathway applies			ZoI	Justification
	C	O&M	D		
					as aquatic animals, as they are primarily adapted for aerial environments. It should also be noted that any piling activities will be short in duration. Therefore, underwater noise during construction is screened out.
Unexploded Ordinance (UXO) clearance during pre-construction	N	N	N	Immediate vicinity of pre-construction activities	UXO clearance may affect diving birds such as guillemot and gannet. Diving birds do not have the same capacity to hear underwater as aquatic animals, as they are primarily adapted for aerial environments. Therefore, UXO clearance during pre-construction is screened out.
Accidental spills to the marine environment	N	N	N	Within Project Area	Accidental release of pollutants may impact ornithological receptors through accidental spills from vessels or other equipment. Spills are likely to be small scale and will be dispersed quickly, leading to limited interaction with ornithological receptors. The risk and impact of any pollutant release will be monitored and reduced through the MPCP, so that any accidental release is strictly controlled, and procedures implemented to minimise potential for impact. Therefore, accidental release of pollutants is screened out.
Entanglement during the operational phase	N	N	N	Immediate vicinity of WTGs	Primary entanglement (direct entanglement with mooring lines or cables etc.) is scoped out as the nature of the mooring lines in terms of tension, rigidity and cable diameter preclude the possibility of forming any entangling loops. Secondary entanglement is defined as the entanglement of marine life in marine debris, such as derelict fishing gear

Potential effect pathway	Project phase where potential effect pathway applies			ZoI	Justification
	C	O&M	D		
					caught on floating offshore wind mooring systems and cables. This potential impact is screened out due to the following: 1. To date, there have been no recorded instances of secondary entanglement in mooring systems of renewable devices or for anchored FPSO used in the oil and gas industry[162] which have similar or more complex mooring systems compared to those proposed by the Project. 2. Fishing activity (demersal trawling and seine netting, and pelagic trawling) within the ICES rectangle in which the Array Area sits (43F1) occurs at low levels. There is no reported gill or trammel netting adjacent to the Array Area. 3. Early consultation and research conducted by the NRDC indicate that marine debris is more likely to entangle at depths between 0 – 5 m below the sea surface[117]. In the semi-submersible design, the keel of the floating substructure will be submerged to approximately 10 – 20 m depth before a chain will connect the floating foundation substructure to catenary mooring lines. This largely removes the potential for diving seabirds to become ensnared in derelict fishing gear. Buoyant fishing gear is unlikely to become ensnared on the keel of the floating substructure reducing the potential for secondary entanglement from this type of fishing gear. For the TLP design, the angle and material of the mooring lines

Potential effect pathway	Project phase where potential effect pathway applies			ZoI	Justification
	C	O&M	D		
					suggests it is likely that ALDFG will slide down the lines rather than hang in the water column. A build-up of marine debris at the bottom of the mooring lines is only likely for heavy fishing gear, such as demersal trawling nets, which would be too heavy to remain suspended in the water column, even when snagged on a mooring line. Secondary entanglement is therefore screened out with respect to diving birds, based on the likely fishing gear types around the Array Area, and the lack of evidence of secondary entanglement from similar industries.

8.3 Offshore Ornithology – Determination of the Potential for Likely Significant Effect Alone

8.3.1.1 The outcome of the process of identifying sites as detailed in Section 8.1 is a 'long list' of designated sites and their relevant qualifying features. These sites and features are subject to consideration of the potential for LSE within this section of the report. This takes account of the identified potential effects for construction, operation and maintenance, and decommissioning phases of the Project as outlined in Section 8.2: The Habitats Regulations Appraisal Process.

8.3.1.2 **Table 8-6** identifies the LSEs for the sites identified in Section 8.1 and provides justification.

8.3.1.3 The assessment of LSE in the following sections is based on a series of matrices setting out whether LSE can be excluded for the relevant features of the European sites identified for each receptor. The matrices are presented in **Appendix B**.

8.3.1.4 The matrix approach adopted is based upon an approach set out within the Planning Inspectorate's Advice Note 10 on HRA[102] which relates to NSIPs. Although it is acknowledged that this guidance is not directly applicable to Scottish projects, the matrix approach used is considered to be a pragmatic approach and useful in defining the extent of impacts from the Array on identified designated sites' qualifying features, in relation to the sites' conservation objectives. It also provides a clear audit trail for agreement with the statutory consultees on the scope of the HRA and the features and impacts to be taken forward into the AA for each site.

8.3.1.5 The assessment and conclusions with regards to potential LSEs on all offshore designated sites and the relevant features identified has been carried out taking account of the ZoI of potential impacts, location of the European site under consideration and (where known) the distribution of qualifying features within the sites. The information is presented below in **Table 8-6**, on a site-by-site basis.

8.3.1.6 Where seabird assemblages qualifying features apply to a SPA the conclusions drawn will be equivalent to the individual qualifying species. Therefore, while evidence supporting the screening of seabird assemblages is detailed in the matrices found in **Appendix B** the information is not repeated in **Table 8-6**.

Table 8-6: Determination of the potential for LSE on SPAs with offshore ornithology qualifying features for Cenos Offshore Windfarm. The determination of seabird assemblage features is equivalent to qualifying features. For this reason, seabird assemblages are detailed in Appendix B only.

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
Ornithology				
Buchan Ness to Collieston Coast SPA	Kittiwake	Disturbance from vessels (C, O, D)	Kittiwake are not considered to be highly sensitive to disturbance[163]. Considering that disturbance effects from vessels are likely be localised and temporary, LSE can be excluded.	**No**
		Distributional responses (O)	During the operation and maintenance phase, kittiwake foraging range may extend to the Array Area during the breeding and non-breeding seasons, hence populations may be affected by displacement or barrier effects from the presence of WTGs and regular maintenance activity with the Project. LSE cannot be excluded for these features at any time of the year during this phase of the Project.	**Yes**
		Changes in prey availability and behaviour (C, O, D)	Presence of the Project does not have potential to impact the foraging of this species with limited effects predicted on prey species and the project being sited away from core foraging areas.	**No**
		Collision risk (O)	There is potential for collision with the Array areas WTGs for Kittiwake in the breeding and non-breeding seasons given that these features may forage within the Array Area and are known to	**Yes**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			fly within the 'at risk' height range within the rotor swept area.	
	Herring gull	Disturbance from vessels (C, O, D)	Herring gull are not considered to be highly sensitive to disturbance[163]. Considering that disturbance effects from vessel are likely be localised and temporary, LSE can be excluded.	**No**
		Distributional responses (O)	During the operation and maintenance phase, herring gull foraging range does not extend to the Array Area during the breeding season. Hence populations will not be affected by displacement or barrier effects from the presence of WTGs and regular maintenance activity with the Project. In addition, large gulls are not known to be sensitive to the presence of WTGS (Dierschke *et al.*, 2016)[82]LSE can be excluded for these features at any time of the year during this phase of the Project.	**No**
		Changes in prey availability and behaviour (C, O, D)	Herring Gull utilises a wide variety of foraging resources so that any localised changes in prey availability as a result of the Project will not result in LSE.	**No**
		Collision risk (O)	The Array Area is outside of foraging range of this species. Herring Gull may be present in the non-breeding season however the population at that season will incorporate birds from a wide variety	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			of sources. The DAS for the Project also recorded a very low abundance of this species (raw count of five individuals). Therefore, LSE can be confidently ruled out.	
	Guillemot	Disturbance from vessels (C, O, D)	While likely to be localised and temporary, there may be temporary disturbance and displacement effects during the construction of the Project. Guillemot are moderately sensitive disturbance and its foraging range extends to the ECC. LSE cannot be excluded.	**Yes**
		Distributional responses (O)	During the operation and maintenance phase, guillemot foraging range does not extend to the Array Area. Considering the relative proximity of the SPA , there remains some potential for interaction in the non-breeding season.. LSE cannot be excluded.	**Yes**
		Changes in prey availability and behaviour (C, O, D)	The presence of the Project does not have potential to impact the foraging of this species with limited effects predicted on prey species and the project being sited away from core foraging areas. LSE can be excluded.	**No**
		Collision risk (O)	Guillemot is not vulnerable to collision [85] [84] [163] and the Array Area is outside of	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			foraging range of this species in the breeding season. LSE can be excluded.	
	Shag	Disturbance from vessels (C, O, D)	While likely to be localised and temporary, there may be temporary disturbance and displacement effects during the construction of the Project within the ECC. Shag are moderately sensitive disturbance and LSE cannot be excluded.	**Yes**
		Distributional responses (O)	The Array Area is outside of the foraging range of shag from this SPA. LSE can therefore be excluded.	**No**
		Changes in prey availability and behaviour (C, O, D)	The presence of the Project does not have potential to impact the foraging of this species with limited effects predicted on prey species and the project being sited away from core foraging areas. LSE can be excluded.	**No**
		Collision risk (O)	Shag is not vulnerable to collision[85 84 163] and the Array Area is outside of foraging range of this species. LSE can be excluded.	**No**
	Fulmar	Disturbance from vessels (C, O, D)	Fulmar are not considered to be sensitive to disturbance[163]. Considering that disturbance effects from vessel are likely be localised and temporary, LSE can be excluded.	**No**
		Distributional responses (O)	While fulmar may forage within the Array Area, this species has a particularly large	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			foraging range and therefore has extensive alternative marine habitats available. Fulmar is not highly vulnerable to distributional responses [85 84 163] . LSE can therefore be excluded.	
		Changes in prey availability and behaviour (C, O, D)	While fulmar may forage within the Project Area, the large foraging range of this feature means that there is extensive alternative marine foraging habitat available. LSE can be excluded.	**No**
		Collision risk (O)	Fulmar is not vulnerable to collision effects [85 84 163] as a high proportion of birds fly below the rotor swept area. LSE can therefore be excluded.	**No**
Loch of Strathbeg	Sandwich tern	Disturbance from vessels (C, O, D)	Sandwich tern are not notably vulnerable to disturbance from ship traffic[73]. Although the ECC is within foraging range, sufficient alternative marine habitat is available for foraging in the unlikely event that this species is disturbed, LSE can be therefore excluded.	**No**
		Distributional responses (O)	During the operation and maintenance phase, Sandwich tern foraging range will not extend to the Array Area. LSE is therefore excluded.	**No**
		Changes in prey availability and behaviour (C, O, D)	The presence of the Project does not have potential to impact the foraging of this species with limited effects predicted	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			on prey species and the Project being sited away from core foraging areas.. LSE can therefore be excluded.	
		Collision risk (O)	The Array Area is outside of foraging range for Sandwich tern and it is considered highly unlikely that there will be interaction with this feature in the non-breeding season. LSE can therefore be excluded.	**No**
	Barnacle goose Pink-footed goose Greylag goose Whooper swan Goldeneye Teal	Disturbance from vessels (C, O, D)	The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded	**No**
		Distributional responses (O)	The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by disturbance or displacement. LSE can be excluded.	**No**
		Changes in prey availability and behaviour (C, O, D)	The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore LSE can be excluded.	**No**
		Collision risk (O)	The MSS strategic assessment report[155] concluded that at a strategic level, the populations of non-seabird species which pass through Scottish waters do not appear to be at risk of significant levels of additional mortality due to	**Yes**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			collisions with Scottish offshore windfarms. It is however evident the number of offshore wind projects and therefore the number of WTGs has increased notably since the publication of the MSS report, An update to the collision risk for migrating birds in Scottish waters was completed by the British Trust for Ornithology in 2023[164]. A CRM specifically for migratory birds is not currently available and Woodward *et al*.[164] outline the scope of a stochastic tool that will be part of a subsequent work package. The Cenos Array Area is considerably offshore, and it is considered likely that interactions with migratory birds will be limited. However, considering that Woodward *et al.*[164] outlines that there is, to some degree, potential connectivity for all species from this SPA (with the exception of greylag goose), LSE cannot at this stage be excluded.	
Ythan Estuary, Sands of Forvie and Meikle Loch	Common tern Sandwich tern Little tern	Disturbance from vessels (C, O, D)	Tern species are not notably vulnerable to disturbance from ship traffic[73]. Although the ECC is within foraging range, sufficient alternative marine habitat is available for foraging in the	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			unlikely event that these features are disturbed, LSE can be therefore excluded.	
		Distributional responses (O)	The Array Area is outside of foraging range for all tern species and it is considered highly unlikely that there will be interaction with these features in the non-breeding season. LSE can therefore be excluded..	**No**
		Changes in prey availability and behaviour (C, O, D)	The presence of the Project does not have potential to impact the foraging of this species with limited effects predicted on prey species and the project being sited away from core foraging areas. LSE can be excluded.	**No**
		Collision risk (O)	The Array Area is outside of foraging range for all tern species and it is considered highly unlikely that there will be interaction with these features in the non-breeding season. LSE can therefore be excluded.	**No**
	Pink-footed goose Eider Redshank Lapwing	Disturbance from vessels (C, O, D)	The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded	**No**
		Distributional responses (O)	The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			will be unaffected by disturbance or displacement. LSE can be excluded.	
		Changes in prey availability and behaviour (C, O, D)	The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore LSE can be excluded	**No**
		Collision risk (O)	The MSS strategic assessment report[155] concluded that at a strategic level, the populations of non-seabird species which pass through Scottish waters do not appear to be at risk of significant levels of additional mortality due to collisions with Scottish offshore windfarms. It is however evident the number of offshore wind projects and therefore the number of WTGs has increased notably since the publication of the MSS report, A update to the collision risk for migrating birds in Scottish waters was completed by the British Trust for Ornithology in 2023[164164]. A CRM specifically for migratory birds is not currently available and Woodward *et al.*[164] outline the scope of a stochastic tool that will be part of a subsequent work package. The Cenos Array Area is considerably offshore, and it is considered likely that interactions with migratory birds will be	**Yes**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			limited. However, considering that Woodward *et al*[164] outlines that there is, to some degree, potential connectivity for all species from this SPA, LSE cannot at this stage be excluded.	
Fowlsheugh	Kittiwake	Disturbance from vessels (C, O, D)	Kittiwake are not considered to be highly sensitive to disturbance[163]. Considering that disturbance effects from vessels are likely be localised and temporary, LSE can be excluded.	**No**
		Distributional responses (O)	During the operation and maintenance phase, kittiwake foraging range may extend to the Array Area during the breeding and non-breeding seasons, hence populations may be affected by displacement or barrier effects from the presence of WTGs and regular maintenance activity with the Project. LSE cannot be excluded for these features during this phase of the Project.	**Yes**
		Changes in prey availability and behaviour (C, O, D)	The presence of the Project does not have potential to impact the foraging of this species with limited effects predicted on prey species and the project being sited away from core foraging areas.	**No**
		Collision risk (O)	There is potential for collision with WTGs for Kittiwake in the breeding and non-breeding seasons given that these features may forage within the Array	**Yes**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			Area and are known to fly within the 'at risk' height range within the rotor swept area. LSE cannot be excluded.	
	Herring gull	Disturbance from vessels (C, O, D)	Herring gull are not considered to be sensitive to disturbance[145]. Considering that disturbance effects from vessels are likely be localised and temporary, LSE can be excluded.	**No**
		Distributional responses (O)	During the operation and maintenance phase, herring gull foraging range does not extend to the Array Area during the breeding season. Hence populations will not be affected by displacement or barrier effects from the presence of WTGs and regular maintenance activity with the Project. In addition, large gulls are not known to be sensitive to the presence of WTGs (Dierschke *et al.,* 2016)[82]. LSE can be excluded for this feature at any time of the year.	**No**
		Changes in prey availability and behaviour (C, O, D)	Herring gull utilises a wide variety of foraging resources so that any localised changes in prey availability due to the Project will not result in LSE.	**No**
		Collision risk (O)	The Array Area is outside of foraging range of this species. Herring gull may be present in the non-breeding season however the population at that season	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			will incorporate birds from a wide variety of sources so that there will be no LSE.	
	Guillemot	Disturbance from vessels (C, O, D)	Guillemot foraging range does not extend to the Array Area but does so to the ECC. While likely to be localised and temporary, there may be temporary disturbance and displacement effects during the construction of the Project. This may extend to guillemot present in the ECC and, in the non-breeding season only, the Array Area. Guillemot are moderately sensitive disturbance and LSE cannot be excluded.	**Yes**
		Distributional responses (O)	Guillemot foraging range does not extend to the Array Area but does so to the ECC. Guillemot from this SPA may interact with the Array Area in the non-breeding season. Hence populations may be affected by displacement or barrier effects from the presence of WTGs and regular maintenance activity with the Project. LSE cannot be excluded for these features during this phase of the Project.	**Yes**
		Changes in prey availability and behaviour (C, O, D)	Ther presence of the Project does not have potential to impact the foraging of this species with limited effects predicted on prey species and the project being sited away from core foraging areas	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
		Collision risk (O)	Guillemot are not vulnerable to collision events as they fly below the rotor swept area[85 84 163] In any case, the foraging range of Guillemot is such that there is no connectivity with the Array Area. LSE can be excluded.	**No**
	Razorbill	Disturbance from vessels (C, O, D)	Razorbill foraging range does not extend to the Array Area but does so to the ECC. While likely to be localised and temporary, there may be temporary disturbance and displacement effects during the construction of the Project. This may extend to guillemot present in the ECC and, in the non-breeding season only, the Array Area. Razorbill are moderately sensitive disturbance and LSE cannot be excluded.	**Yes**
		Distributional responses (O)	Razorbill foraging range does not extend to the Array Area but does so to the ECC There is potential that razorbill from this SPA will interact with the Array Area in the non-breeding season. Therefore populations may be affected by displacement or barrier effects from the presence of WTGs and regular maintenance activity with the Project. LSE cannot be excluded.	**Yes**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
		Changes in prey availability and behaviour (C, O, D)	The presence of the Project does not have potential to impact the foraging of this species with limited effects predicted on prey species and the project being sited away from core foraging areas. LSE can be excluded.	**No**
		Collision risk (O)	Razorbills are not vulnerable to collision events as they fly below the rotor swept area[85 84 163]. In any case, the foraging range of razorbill is such that there is no connectivity with the Array Area. LSE can be excluded.	**No**
	Fulmar	Disturbance from vessels (C, O, D)	Fulmar are not considered to be sensitive to disturbance[163]. Considering that disturbance effects from vessel are likely be localised and temporary, LSE can be excluded.	**No**
		Distributional responses (O)	While fulmar may forage within the Array Area, this species has a particularly large foraging range and therefore has extensive alternative marine habitats available. Fulmar is not vulnerable to distributional responses [85 84 163]. LSE can therefore be excluded.	**No**
		Changes in prey availability and behaviour (C, O, D)	While fulmar may forage within the Project Area, the large foraging range of this feature means that there is extensive alternative marine foraging habitat available. LSE can be excluded.	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
		Collision risk (O)	Fulmar is not vulnerable to collision effects[85 84 163] as a high proportion of birds fly below the rotor swept area. LSE can therefore be excluded	**No**
Troup, Pennan and Lion's Head	Kittiwake	Disturbance from vessels (C, O, D)	Kittiwake are not considered to be sensitive to disturbance[163.] Considering that disturbance effects from vessels are likely be localised and temporary, LSE can be excluded.	**No**
		Distributional responses (O)	During the operation and maintenance phase, kittiwake foraging range may extend to the Array Area during the breeding and non-breeding seasons, hence populations may be affected by displacement or barrier effects from the presence of WTGs and regular maintenance activity with the Project. LSE cannot be excluded for these features at any time of the year during this phase of the Project.	**Yes**
		Changes in prey availability and behaviour (C, O, D)	The presence of the Project does not have potential to impact the foraging of this species with limited effects predicted on prey species and the project being sited away from core foraging areas. LSE can be excluded.	**No**
		Collision risk (O)	There is potential for collision with WTGs for Kittiwake in the breeding and non-breeding seasons given that these	**Yes**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			features may forage within the Array Area and are known to fly within the 'at risk' height range within the rotor swept area. LSE cannot be excluded.	
	Herring gull	Disturbance from vessels (C, O, D))	The foraging range of herring gull shows that there will be no connectivity with the Array Area. While herring gull may be present in the ECC, the alternative habitat available and the species low sensitivity to disturbance means that LSE can be excluded in both the breeding and non-breeding seasons.	**No**
		Distributional responses (O)	Herring gull foraging range does not extend to the Array Area. DAS recorded only very low numbers of this species (5 individuals in the Array Areas) and these birds will be from a wide variety of sources. LSE can therefore be excluded.	**No**
		Changes in prey availability and behaviour (C, O, D)	Herring gull utilises a wide variety of foraging resources so that any localised changes in prey availability as a result of the Project will not result in LSE.	**No**
		Collision risk (O)	Herring gull foraging range does not extend to the Array Area. DAS recorded only very low numbers of this species (5 individuals in the Array Areas) and these birds will be from a wide variety of	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			sources. LSE can therefore be excluded.	
	Guillemot	Disturbance from vessels (C, O, D)	Guillemot foraging range does not extend to the Array Area but does so to the ECC. While likely to be localised and temporary, there may be temporary disturbance and displacement effects during the construction of the Project. This may extend to guillemot present in the ECC and, in the non-breeding season only, the Array Area. Guillemot are moderately sensitive to disturbance and LSE cannot be excluded.	**Yes**
		Distributional responses (O)	Guillemot foraging range does not extend to the Array Area . However, guillemot from this SPA may interact with the Array Area in the non-breeding season. Therefore, populations may be affected by displacement or barrier effects from the presence of WTGs and regular maintenance activity with the Project. LSE cannot be excluded for these features during this phase of the Project.	**Yes**
		Changes in prey availability and behaviour (C, O, D)	The presence of the Project does not have potential to impact the foraging of this species with limited effects predicted on prey species and the project being	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			sited away from core foraging areas. LSE can be excluded.	
		Collision risk (O)	Guillemot are not vulnerable to collision events as they fly below the rotor swept area[85 84 163] In any case, the foraging range of Guillemot is such that there is no connectivity with the Array Area. LSE can be excluded.	**No**
	Razorbill	Disturbance from vessels (C, O, D)	Razorbill foraging range does not extend to the Array Area but does so to the ECC. While likely to be localised and temporary, there may be temporary disturbance and displacement effects during the construction of the Project. This may extend to razorbill present in the ECC and, in the non-breeding season only, the Array Area. Razorbill are moderately sensitive disturbance and LSE cannot be excluded.	**Yes**
		Distributional responses (O)	Razorbill foraging range does not extend to the Array Area. However, razorbill from this SPA may interact with the Array Area in the non-breeding season. Therefore, populations may be affected by displacement or barrier effects from the presence of WTGs and regular maintenance activity with the Project.	**Yes**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			LSE cannot be excluded for these features during this phase of the Project.	
		Changes in prey availability and behaviour (C, O, D)	The presence of the Project does not have potential to impact the foraging of this species with limited effects predicted on prey species and the project being sited away from core foraging areas. LSE can be excluded.	**No**
		Collision risk (O)	Razorbills are not vulnerable to collision events as they fly below the rotor swept area[85 84 163]. In any case, the foraging range of razorbill is such that there is no connectivity with the Array Area. LSE can be excluded.	**No**
	Fulmar	Disturbance from vessels (C, O, D)	Fulmar are not considered to be sensitive to disturbance[163.] Considering that disturbance effects from vessel are likely be localised and temporary, LSE can be excluded.	**No**
		Distributional responses (O)	While fulmar may forage within the Array Area, this species has a particularly large foraging range and therefore has extensive alternative marine habitats available. Fulmar is not highly vulnerable to distributional responses [85 84 163]. LSE can therefore be excluded.	**No**
		Changes in prey availability and behaviour (C, O, D)	While fulmar may also forage within the Project Area, the large foraging range of	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			this feature means that there is extensive alternative marine foraging habitat available. As such, it is highly unlikely that changes to prey availability in the vicinity of the Project would result in LSE for this feature at any time of year.	
		Collision risk (O)	Fulmar is not vulnerable to collision effects[85 84 163] as a high proportion of birds fly below the rotor swept area. LSE can therefore be excluded.	**No**
St. Abbs Head to Fast Castle	Kittiwake	Disturbance from vessels (C, O, D)	Kittiwake are not considered to be highly sensitive to disturbance[163.] Considering that disturbance effects from vessels are likely be localised and temporary and that tracking data shows no interaction with the Projects region[165], LSE can therefore be excluded.	**No**
		Distributional responses (O)	Tracking data of kittiwake from this SPA shows no interaction with the Projects region[165], LSE can therefore be excluded.	**No**
		Changes in prey availability and behaviour (C, O, D)	Tracking data of kittiwake from this SPA shows no interaction with the Projects region[165], LSE can therefore be excluded.	**No**
		Collision risk (O)	Tracking data of kittiwake from this SPA shows no interaction with the Projects region[165], LSE can therefore be excluded.	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
Farne Islands	Puffin	Disturbance from vessels (C, O, D)	Puffin foraging range extends to the Array Area and ECC. While likely to be localised and temporary, there may be temporary disturbance effects from vessel activities. LSE cannot be excluded.	**Yes**
		Distributional responses (O)	Puffin foraging range extends to the Array Area and ECC. Populations may be affected by distributional responses during the operation and maintenance phase. LSE cannot be excluded.	**Yes**
		Changes in prey availability and behaviour (C, O, D)	The presence of the Project does not have potential to impact the foraging of this species with limited effects predicted on prey species and the project being sited away from core foraging areas	**No**
		Collision risk (O)	Puffins are not vulnerable to collision events as they fly below the rotor swept area [85 86 163]. LSE can be excluded.	**No**
Forth Islands	Kittiwake	Disturbance from vessels (C, O, D)	Kittiwake are not considered to be highly sensitive to disturbance[163.] Considering that disturbance effects from vessels are likely be localised and temporary, LSE can be excluded.	**No**
		Distributional responses (O)	During the operational and maintenance phase, kittiwake foraging range may extend to the Array Area during the breeding and non-breeding seasons, hence populations may be affected by	**Yes**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			displacement or barrier effects from the presence of WTGs and regular maintenance activity with the Project. LSE cannot be excluded for these features at any time of the year during this phase of the Project.	
		Changes in prey availability and behaviour (C, O, D)	Presence of the Project does not have potential to impact the foraging of this species with limited effects predicted on prey species and the project being sited away from core foraging areas	**No**
		Collision risk (O)	There is potential for collision with WTGs for kittiwake in the breeding and non-breeding seasons given that these features may forage within the Array Area and are known to fly within the 'at risk' height range within the rotor swept area. LSE cannot be excluded.	**Yes**
	Lesser black-backed gull	Disturbance from vessels (C, O, D)	Lesser black-backed gull are not considered to be sensitive to disturbance[163.] Considering that disturbance effects from vessel are likely be localised and temporary, and that no individuals of this species were recorded in DAS, LSE can be excluded.	**No**
		Distributional responses (O)	Lesser black-backed gull foraging range does not extend to the Array Area and that no individuals of this species were	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			recorded in DAS.LSE can therefore be excluded.	
		Changes in prey availability and behaviour (C, O, D)	Lesser black-backed gull utilises a wide variety of foraging resources so that any localised changes in prey availability because of the Project will not result in LSE. In addition, no individuals of this species were recorded in DAS.	**No**
		Collision risk (O)	The Array Area is outside of foraging range of this species. In addition, it is noted that no individuals of this species were recorded in DAS. LSE can therefore be excluded.	**No**
	Razorbill	Disturbance from vessels (C, O, D)	Razorbill foraging range does not extend to the Array Area but does so to the ECC. While likely to be localised and temporary, there may be temporary disturbance and displacement effects during the construction of the Project. This may extend to guillemot present in the ECC and, in the non-breeding season only, the Array Area. Razorbill are moderately sensitive disturbance and LSE cannot be excluded.	**Yes**
		Direct disturbance and displacement (C, O, D)	Razorbill foraging range does not extend to the Array Area but does so to the ECC. Components of the SPA population may be present in the non-breeding	**Yes**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			season. LSE therefore cannot be excluded.	
		Changes in prey availability and behaviour (C, O, D)	Presence of the Project does not have potential to impact the foraging of this species with limited effects predicted on prey species and the project being sited away from core foraging areas. LSE can be excluded.	**No**
		Collision risk (O)	Razorbills are not vulnerable to collision events as they fly below the rotor swept area[85 86 163]. In any case, the foraging range of Razorbill is such that there is no connectivity with the Array Area. LSE can be excluded.	**No**
	Puffin	Disturbance from vessels (C, O, D)	Puffin foraging range extends to the Array Area and ECC. While likely to be localised and temporary, there may be disturbance effects from vessel activities. LSE cannot be excluded.	**Yes**
		Direct disturbance and displacement (C, O, D)	Puffin foraging range extends to the Array Area.. LSE therefore cannot be excluded.	**Yes**
		Changes in prey availability and behaviour (C, O, D)	The presence of the Project does not have potential to impact the foraging of this species with limited effects predicted on prey species and the project being sited away from core foraging areas. LSE can be excluded.	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
		Collision risk (O)	Puffin are not vulnerable to collision events as they fly below the rotor swept area[85 86 163]. In any case, the foraging range of puffin is such that there is no connectivity with the Array Area. LSE can be excluded.	**No**
	Gannet	Disturbance from vessels (C, O, D)	Foraging range of Gannet extends to the Array Area and ECC. Gannet are however are not considered to be highly sensitive to disturbance[163] . Considering that disturbance effects from vessel are likely be localised and temporary, LSE can be excluded.	**No**
		Distributional responses (O)	Foraging range of gannet extends to the Array Area during the breeding season, hence populations may be affected by distributional responses. LSE cannot be excluded.	**Yes**
		Changes in prey availability and behaviour (C, O, D)	The presence of the Project does not have potential to impact the foraging of this species with limited effects predicted on prey species and the project being sited away from core foraging areas. LSE can be excluded.	**No**
		Collision risk (O)	There is potential for collision with WTGs for gannet, given its foraging range extends to the Array Area and that the species may fly within the 'at risk' height range within the rotor swept area during	**Yes**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			the breeding and non-breeding season. LSE cannot be excluded.	
East Caithness Cliffs	Kittiwake	Disturbance from vessels (C, O, D)	Kittiwake are not considered to be highly sensitive to disturbance[163]. Considering that disturbance effects from vessels are likely be localised and temporary, LSE can be excluded.	**No**
		Distributional responses (O)	During the operation and maintenance phase, kittiwake foraging range may extend to the Array Area during the breeding and non-breeding seasons, hence populations may be affected by displacement or barrier effects from the presence of WTGs and regular maintenance activity with the Project. LSE cannot be excluded for these features at any time of the year.	**Yes**
		Changes in prey availability and behaviour (C, O, D)	Presence of the Project does not have potential to impact the foraging of this species with limited effects predicted on prey species and the project being sited away from core foraging areas	**No**
		Collision risk (O)	There is potential for collision with WTGs for kittiwake in the breeding and non-breeding seasons given that these features may forage within the Array Area and are known to fly within the 'at risk' height range within the rotor swept area. LSE cannot be excluded.	**Yes**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
	Great black-backed gull	Disturbance from vessels (C, O, D)	The foraging range of great black-backed gull shows that there will be no connectivity with the Array Area. While reat black-backed gull may be present in the ECC, the alternative habitat available and the low sensitivity to disturbance means that LSE can be excluded.	**No**
		Distributional responses (O)	Great black-backed gull foraging range does not extend to the Array Area. While this species was found to be present during DAS, only 28 observations were recorded in the Array Area and these birds origin could be from a wide variety of sources. LSE can therefore be excluded.	**No**
		Changes in prey availability and behaviour (C, O, D)	The Array Area is outside of foraging range of this species. Great Black-backed Gull may be present in the non-breeding season however the population at that season will incorporate birds from a wide variety of sources that have a considerable expanse of alternative habitat in which to forage. LSE is therefore excluded.	**No**
		Collision risk (O)	Great black-backed gull foraging range does not extend to the Array Area. While this species was found to be present during DAS, only 28 observations were recorded in the Array Area and these	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			birds origin could be from a wide variety of sources. LSE can therefore be excluded.	
	Guillemot	Disturbance from vessels (C, O, D)	Guillemot foraging range does not extend to the Array Area but does so to the ECC. Guillemot from this SPA has a low potential of interacting with the Array Area in the non-breeding season. While likely to be localised and temporary, there may be disturbance effects from vessel activities. LSE cannot be excluded.	**Yes**
		Distributional responses (O)	Guillemot foraging range does not extend to the Array Area. Guillemot from this SPA has a low potential of interacting with the Array Area in the non-breeding season. Guillemot are moderately sensitive disturbance and LSE cannot be excluded.	**Yes**
		Changes in prey availability and behaviour (C, O, D)	The presence of the Project does not have potential to impact the foraging of this species with limited effects predicted on prey species and the project being sited away from core foraging areas. LSE can be excluded.	**No**
		Collision risk (O)	Guillemot are not vulnerable to collision events as they fly below the rotor swept area[85 86 163].	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			In any case, the foraging range of guillemot is such that there is no connectivity with the Array Area. LSE can be excluded.	
	Razorbill	Disturbance from vessels (C, O, D)	Razorbill foraging range does not extend to the Array Area but does so to the ECC. While likely to be localised and temporary, there may be disturbance and displacement effects during the construction of the Project. This may extend to razorbill present in the ECC and, in the non-breeding season only, the Array Area. Razorbill are moderately sensitive disturbance and LSE cannot be excluded.	**Yes**
		Direct disturbance and displacement (C, O, D)	Razorbill foraging range does not extend to the Array Area. Components of the SPA population may however be present in the non-breeding season. LSE therefore cannot be excluded.	**Yes**
		Changes in prey availability and behaviour (C, O, D)	Presence of the Project does not have potential to impact the foraging of this species with limited effects predicted on prey species and the project being sited away from core foraging areas	**No**
		Collision risk (O)	Razorbills are not vulnerable to collision events as they fly below the rotor swept area[85 86 163].	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			In any case, the foraging range of razorbill is such that there is no connectivity with the Array Area. LSE can be excluded.	
	Fulmar	Disturbance from vessels (C, O, D)	Fulmar are not considered to be sensitive to disturbance[163.] Considering that disturbance effects from vessel are likely be localised and temporary, LSE can be excluded.	**No**
		Distributional responses (O)	While fulmar may forage within the Array Area, this species has a particularly large foraging range and therefore has extensive alternative marine habitats available. Fulmar is not highly vulnerable to distributional responses [85 84 163]. LSE can be excluded.	**No**
		Changes in prey availability and behaviour (C, O, D)	While fulmar may also forage within the Project Area, the large foraging range of this feature means that there is extensive alternative marine foraging habitat available. As such, it is highly unlikely that changes to prey availability in the vicinity of the Project would result in LSE for this feature at any time of year.	**No**
		Collision risk (O)	Fulmar is not vulnerable to collision effects[85 86 163] as a high proportion of birds fly below the rotor swept area. LSE can therefore be excluded.	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
Copinsay	Kittiwake	Disturbance from vessels (C, O, D)	Kittiwake are not considered to be highly sensitive to disturbance[163]. Considering that disturbance effects from vessels are likely be localised and temporary, LSE can be excluded.	**No**
		Distributional responses (O)	During the operation and maintenance phase, kittiwake foraging range may extend to the Array Area during the breeding and non-breeding seasons, hence populations may be affected by displacement or barrier effects from the presence of WTGs and regular maintenance activity with the Project. LSE cannot be excluded for these features at any time of the year during this phase of the Project.	**Yes**
		Changes in prey availability and behaviour (C, O, D)	The presence of the Project does not have potential to impact the foraging of this species with limited effects predicted on prey species and the project being sited away from core foraging areas.	**No**
		Collision risk (O)	There is potential for collision with WTGs for kittiwake in the breeding and non-breeding seasons given that these features may forage within the Array Area and are known to fly within the 'at risk' height range within the rotor swept area. LSE cannot be excluded.	**Yes**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
	Fulmar	Disturbance from vessels (C, O, D)	Fulmar are not considered to be sensitive to disturbance[163.] Considering that disturbance effects from vessel are likely be localised and temporary, LSE can be excluded.	**No**
		Distributional responses (O)	While fulmar may forage within the Array Area, this species has a particularly large foraging range and therefore has extensive alternative marine habitats available. Fulmar is not highly vulnerable to distributional responses [85 84 163]. LSE can therefore be excluded.	**No**
		Changes in prey availability and behaviour (C, O, D)	While fulmar may also forage within the Project Area, the large foraging range of this feature means that there is extensive alternative marine foraging habitat available. As such, it is highly unlikely that changes to prey availability in the vicinity of the Project would result in LSE for this feature at any time of year.	**No**
		Collision risk (O)	Fulmar is not vulnerable to collision effects[85 86 163] as a high proportion of birds fly below the rotor swept area. LSE can therefore be excluded.	**No**
North Caithness Cliffs	Kittiwake	Disturbance from vessels (C, O, D)	Kittiwake are not considered to be highly sensitive to disturbance[163.] Considering that disturbance effects from vessels are likely be localised and temporary, LSE can be excluded.	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
		Distributional responses (O)	During the operation and maintenance phase, kittiwake foraging range may extend to the Array Area during the breeding and non-breeding seasons, hence populations may be affected by displacement or barrier effects from the presence of WTGs and regular maintenance activity with the Project. LSE cannot be excluded for these features at any time of the year during this phase of the Project.	**Yes**
		Changes in prey availability and behaviour (C, O, D)	The presence of the Project does not have potential to impact the foraging of this species with limited effects predicted on prey species and the project being sited away from core foraging areas.	**No**
		Collision risk (O)	There is potential for collision with WTGs for Kittiwake in the breeding and non-breeding seasons given that these features may forage within the Array Area and are known to fly within the 'at risk' height range within the rotor swept area. LSE cannot be excluded.	**Yes**
	Razorbill	Disturbance from vessels (C, O, D)	Razorbill foraging range does not extend to the Array Area or the ECC. As impacts are likely to be localised and temporary, there may be temporary disturbance and numbers of razorbill from this SPA will be	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			limited in the Project area in the non-breeding season, LSE can be excluded.	
		Direct disturbance and displacement (C, O, D)	Razorbill foraging range does not extend to the Array Area. Components of the SPA population may however be present in the non-breeding season. LSE therefore cannot be excluded.	**Yes**
		Changes in prey availability and behaviour (C, O, D)	The presence of the Project does not have potential to impact the foraging of this species with limited effects predicted on prey species and the project being sited away from core foraging areas.	**No**
		Collision risk (O)	Razorbills are not vulnerable to collision events as they fly below the rotor swept area[85 86 163]. In any case, the foraging range of razorbill is such that there is no connectivity with the Array Area. LSE can be excluded.	**No**
	Puffin	Disturbance from vessels (C, O, D)	Puffin foraging range does not extend to the Array Area but does so to the ECC. While likely to be localised and temporary, there may be temporary disturbance and displacement effects during the construction of the Project. This may extend to guillemot present in the ECC and, in the non-breeding season only, the Array Area. Puffin are	**Yes**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			moderately sensitive disturbance and LSE cannot be excluded.	
		Direct disturbance and displacement (C, O, D)	Puffin foraging range does not extend to the Array Area. Components of the SPA population may however be present in the non-breeding season. LSE therefore cannot be excluded.	**Yes**
		Changes in prey availability and behaviour (C, O, D)	The presence of the Project does not have potential to impact the foraging of this species with limited effects predicted on prey species and the project being sited away from core foraging areas.	**No**
		Collision risk (O)	Puffin are not vulnerable to collision events as they fly below the rotor swept area[85 86 163]. In any case, the foraging range of Razorbill is such that there is no connectivity with the Array Area. LSE can be excluded.	**No**
	Fulmar	Disturbance from vessels (C, O, D)	Fulmar are not considered to be sensitive to disturbance[163]. Considering that disturbance effects from vessel are likely be localised and temporary, LSE can be excluded.	**No**
		Distributional responses (O)	While fulmar may forage within the Array Area, this species has a particularly large foraging range and therefore has extensive alternative marine habitats available. Fulmar is not highly vulnerable	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			to distributional responses [85 84 163]. LSE can therefore be excluded.	
		Changes in prey availability and behaviour (C, O, D)	While fulmar may also forage within the Project Area, the large foraging range of this feature means that there is extensive alternative marine foraging habitat available. As such, it is highly unlikely that changes to prey availability in the vicinity of the Project would result in LSE for this feature at any time of year.	**No**
		Collision risk (O)	Fulmar is not vulnerable to collision effects[85 86 163] as a high proportion of birds fly below the rotor swept area. LSE can therefore be excluded.	**No**
Fair Isle	Kittiwake	Disturbance from vessels (C, O, D)	Kittiwake are not considered to be highly sensitive to disturbance[163.] Considering that disturbance effects from vessels are likely be localised and temporary, LSE can be excluded.	**No**
		Distributional responses (O)	During the operation and maintenance phase, kittiwake foraging range does not extend to the Array Area during the breeding season. Components of the SPA population may be present in the non-breeding season, however; hence populations may be affected by displacement or barrier effects from the	**Yes**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			presence of WTGs and regular maintenance activity with the Project. LSE cannot be excluded for these features during this phase of the Project.	
		Changes in prey availability and behaviour (C, O, D)	The presence of the Project does not have potential to impact the foraging of this species with limited effects predicted on prey species and the project being sited away from core foraging areas. LSE can be excluded.	**No**
		Collision risk (O)	Kittiwake foraging range does not extend to the Array Area from Fair Isle SPA in the breeding season. Kittiwake from this SPA may pass through the Array Area in the non-breeding season however; LSE cannot therefore be excluded.	**Yes**
	Puffin	Disturbance from vessels (C, O, D)	Puffin foraging range does not extend to the Array Area but does so to the ECC In addition, while likely to be localised and temporary, there may be disturbance and displacement effects during the construction of the Project in the ECC and, in the non-breeding season only, the Array Area. Puffin are moderately sensitive disturbance and LSE cannot be excluded.	**Yes**
		Direct disturbance and displacement (C, O, D)	Puffin foraging range does not extend to the Array Area. Components of the SPA population may however be present in	**Yes**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			the non-breeding season. LSE therefore cannot be excluded..	
		Changes in prey availability and behaviour (C, O, D)	The presence of the Project does not have potential to impact the foraging of this species with limited effects predicted on prey species and the project being sited away from core foraging areas. LSE can be excluded.	**No**
		Collision risk (O)	Puffin are not vulnerable to collision events as they fly below the rotor swept area[85 86 163]. In any case, the foraging range of puffin is such that there is no connectivity with the Array Area. LSE can be excluded.	**No**
	Gannet	Disturbance from vessels (C, O, D)	Foraging range of Gannet extends to the Array Area and ECC. Gannet are not considered to be highly sensitive to disturbance[163.]Considering that disturbance effects from vessel are likely be localised and temporary, LSE can be excluded.	**No**
		Distributional responses (O)	Foraging range of gannet extends to the Array Area during the breeding season; hence populations may be affected by distributional responses. LSE cannot therefore be excluded.	**Yes**
		Changes in prey availability and behaviour (C, O, D)	The presence of the Project does not have potential to impact the foraging of this species with limited effects predicted	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			on prey species and the project being sited away from core foraging areas. LSE can be excluded.	
		Collision risk (O)	There is potential for collision with WTGs for gannet, given its foraging range extends to the Array Area and may fly within the 'at risk' height range within the rotor swept area during the breeding and non-breeding season. LSE cannot be excluded.	**Yes**
	Fulmar	Disturbance from vessels (C, O, D)	Fulmar are not considered to be sensitive to disturbance[163]. Considering that disturbance effects from vessel are likely be localised and temporary, LSE can be excluded.	**No**
		Distributional responses (O)	While fulmar may forage within the Array Area, this species has a particularly large foraging range and therefore has extensive alternative marine habitats available. Fulmar is not highly vulnerable to distributional responses [85] [84] [163]. LSE can therefore be excluded.	**No**
		Changes in prey availability and behaviour (C, O, D)	While fulmar may also forage within the Project Area, the large foraging range of this feature means that there is extensive alternative marine foraging habitat available. As such, it is highly unlikely that changes to prey availability in the	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			vicinity of the Project would result in LSE for this feature at any time of year.	
		Collision risk (O)	Fulmar is not vulnerable to collision effects[85 86 163] as a high proportion of birds fly below the rotor swept area. LSE can therefore be excluded.	**No**
	Great skua	Disturbance from vessels (C, O, D)	Great skua are not considered to be highly sensitive to disturbance[163]. Considering that disturbance effects from vessel are likely be localised and temporary, LSE can be excluded.	**No**
		Distributional responses (O)	While great skua is within foraging range of the Array Area, this species has a particularly large foraging range and therefore has extensive alternative marine habitats available for foraging. LSE can be excluded.	**No**
		Changes in prey availability and behaviour (C, O, D)	While great skua is within foraging range of the Project Area, the large foraging range of this feature means that there is extensive alternative marine foraging habitat available. As such, it is highly unlikely that changes to prey availability in the vicinity of the Project would result in LSE for this feature at any time of year.	**No**
		Collision risk (O)	While great skua from this SPA are within foraging range of the Array Area, only 2 individuals were recorded in the	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			DAS (and one within the Array Areas). LSE can therefore be excluded.	
Hoy	Kittiwake	Disturbance from vessels (C, O, D)	Kittiwake foraging range does not extend to either the Array Area but does so to the ECC.. Kittiwake is not considered to be sensitive to disturbance[163.]. Considering that any impact will be temporary, LSE can be excluded.	**No**
		Distributional responses (O)	Kittiwake foraging range does not extend to either the Array Area in the breeding season. Components of the SPA population may be present in the non-breeding season; however, hence populations may be affected by displacement or barrier effects from the presence of WTGs and regular maintenance activity with the Project. LSE cannot be excluded for these features during this phase of the Project.	**Yes**
		Changes in prey availability and behaviour (C, O, D)	The possibility of indirect effects from changes in prey abundance, availability and/or distribution can be excluded for Kittiwake from this SPA which is not in foraging range for either the Array Area or ECC.	**No**
		Collision risk (O)	Kittiwake foraging range does not extend to the Array Area from this SPA in the breeding season. Kittiwake may however pass through the Array Area in the non-	**Yes**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			breeding season; however, LSE cannot therefore be excluded.	
	Great black-backed gull	Disturbance from vessels (C, O, D)	The foraging range of great black-backed gull shows that there will be no connectivity with the Array Area. While great black-backed gull may be present in the ECC, the alternative habitat available and the low sensitivity to disturbance means that LSE can be excluded.	**No**
		Distributional responses (O)	Great black-backed gull foraging range does not extend to the Array Area. DAS recorded only very low numbers of this species and these birds will be from a wide variety of sources. LSE can therefore be excluded.	**No**
		Changes in prey availability and behaviour (C, O, D)	The presence of the Project does not have potential to impact the foraging of this species with limited effects predicted on prey species and the project being sited away from core foraging areas. LSE can be excluded.	**No**
		Collision risk (O)	Great black-backed gull foraging range does not extend to the Array Area. DAS recorded only very low numbers of this species and these birds will be from a wide variety of sources. LSE can therefore be excluded.	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
	Razorbill	Disturbance from vessels (C, O, D)	Razorbill foraging range does not extend to the Array Area or the ECC in the breeding season. While Razorbill from this SPA may interact with the Array Area in the non-breeding season impacts are likely to be localised and temporary, and with a considerable area of alternative habitat available, LSE can be excluded.	**No**
		Distributional responses (O)	Razorbill foraging range does not extend to the Array Area in the breeding season, but components of the SPA population may be present in the non-breeding season. Razorbill may be sensitive to displacement effects during this period and LSE cannot therefore be excluded.	**Yes**
		Changes in prey availability and behaviour (C, O, D)	The possibility of indirect effects from changes in prey abundance, availability and/or distribution can be excluded for razorbill which is not in foraging range of the ECC or Array Area. Razorbill may pass through the site in the non-breeding season, however the extensive marine habitat available in this period means that LSE can be excluded.	**No**
		Collision risk (O)	Razorbill are not vulnerable to collision events as they fly below the rotor swept area[85 86 163].	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			In any case, the foraging range of Razorbill is such that there is no connectivity with the Array Area.	
	Puffin	Disturbance from vessels (C, O, D)	Puffin foraging range does not extend to the Array Area but does so to the ECC. While likely to be localised and temporary, there may be temporary disturbance and displacement effects during the construction of the Project. Puffin are moderately sensitive disturbance and LSE cannot be excluded.	**Yes**
		Distributional responses (O)	Puffin foraging range does not extend to the Array Area in the breeding season, but components of the SPA population may be present in the non-breeding season. LSE therefore cannot be excluded.	**Yes**
		Changes in prey availability and behaviour (C, O, D)	Presence of the Project does not have potential to impact the foraging of this species with limited effects predicted on prey species and the project being sited away from core foraging areas.	**No**
		Collision risk (O)	Puffin are not vulnerable to collision events as they fly below the rotor swept area[85 86 163]. In any case, the foraging range of Puffin is such that there is no connectivity with the Array Area.	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
	Fulmar	Disturbance from vessels (C, O, D)	Fulmar are not considered to be sensitive to disturbance[163.] Considering that disturbance effects from vessel are likely be localised and temporary, LSE can be excluded.	**No**
		Distributional responses (O)	While fulmar may forage within the Array Area, this species has a particularly large foraging range and therefore has extensive alternative marine habitats available. Fulmar is not highly vulnerable to distributional responses [85 84 163]. LSE can therefore be excluded.	**No**
		Changes in prey availability and behaviour (C, O, D)	While fulmar may also forage within the Project Area, the large foraging range of this feature means that there is extensive alternative marine foraging habitat available. As such, it is highly unlikely that changes to prey availability in the vicinity of the Project would result in LSE for this feature at any time of year.	**No**
		Collision risk (O)	Fulmar is not vulnerable to collision effects[85 86 163] as a high proportion of birds fly below the rotor swept area. LSE can therefore be excluded.	**No**
	Great skua	Disturbance from vessels (C, O, D)	Great skua are not considered to be highly sensitive to disturbance[163.] Considering that disturbance effects from vessel are likely be localised and temporary, LSE can be excluded.	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
		Distributional responses (O)	While great skua is within foraging range of the Array Area, this species has a particularly large foraging range and therefore has extensive alternative marine habitats available for foraging. LSE can be excluded.	**No**
		Changes in prey availability and behaviour (C, O, D)	While great skua is within foraging range of the Project Area, the large foraging range of this feature means that there is extensive alternative marine foraging habitat available. As such, it is highly unlikely that changes to prey availability in the vicinity of the Project would result in LSE for this feature at any time of year.	**No**
		Collision risk (O)	While great skua from this SPA are within foraging range of the Array Area, only two individuals were recorded in the DAS (and one within the Array Areas). LSE can therefore be excluded.	**No**
Calf of Eday	Kittiwake	Disturbance from vessels (C, O, D)	Kittiwake are not considered to be highly sensitive to disturbance[163.] Considering that disturbance effects from vessels are likely be localised and temporary, LSE can be excluded.	**No**
		Distributional responses (O)	During the operation and maintenance phase, kittiwake foraging range does not extend to the Array Area during the breeding season. Components of the	**Yes**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			SPA population may be present in the non-breeding season; however, hence populations may be affected by displacement or barrier effects from the presence of WTGs and regular maintenance activity with the Project. LSE cannot be excluded for these features during this phase of the Project.	
		Changes in prey availability and behaviour (C, O, D)	The presence of the Project does not have potential to impact the foraging of this species with limited effects predicted on prey species and the project being sited away from core foraging areas.	**No**
		Collision risk (O)	Kittiwake foraging range does not extend to the Array Area from this SPA in the breeding season. There is however a possibility that kittiwake from this SPA will pass through the Array Area in the non-breeding season. LSE cannot therefore be excluded.	**Yes**
	Fulmar	Disturbance from vessels (C, O, D)	Fulmar are not considered to be sensitive to disturbance[163]. Considering that disturbance effects from vessel are likely be localised and temporary, LSE can be excluded.	**No**
		Distributional responses (O)	While fulmar may forage within the Array Area, this species has a particularly large foraging range and therefore has extensive alternative marine habitats	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			available. Fulmar is not highly vulnerable to distributional responses [85 84 163]. LSE can therefore be excluded.	
		Changes in prey availability and behaviour (C, O, D)	While fulmar may also forage within the Project Area, the large foraging range of this feature means that there is extensive alternative marine foraging habitat available. As such, it is highly unlikely that changes to prey availability in the vicinity of the Project would result in LSE for this feature at any time of year.	**No**
		Collision risk (O)	Fulmar is not vulnerable to collision effects[85 86 163] as a high proportion of birds fly below the rotor swept area. LSE can therefore be excluded.	**No**
Sumburgh Head	Kittiwake	Disturbance from vessels (C, O, D)	Kittiwake are not considered to be highly sensitive to disturbance[163]. Considering that disturbance effects from vessels are likely be localised and temporary, LSE can be excluded.	**No**
		Distributional responses (O)	During the operation and maintenance phase, kittiwake foraging range does not extend to the Array Area during the breeding season. Components of the SPA population may be present in the non-breeding season; however, hence populations may be affected by displacement or barrier effects from the presence of WTGs and regular	**Yes**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			maintenance activity with the Project. LSE cannot be excluded for these features during this phase of the Project.	
		Changes in prey availability and behaviour (C, O, D)	The presence of the Project does not have potential to impact the foraging of this species with limited effects predicted on prey species and the project being sited away from core foraging areas.	**No**
		Collision risk (O)	Kittiwake foraging range does not extend to the Array Area from this SPA in the breeding season. There is however as possibility that kittiwake from this SPA will pass through the Array Area in the non-breeding season. LSE cannot therefore be excluded.	**Yes**
	Fulmar	Disturbance from vessels (C, O, D)	Fulmar are not considered to be sensitive to disturbance[163]. Considering that disturbance effects from vessel are likely be localised and temporary, LSE can be excluded.	**No**
		Distributional responses (O)	While fulmar may forage within the Array Area, this species has a particularly large foraging range and therefore has extensive alternative marine habitats available. Fulmar is not highly vulnerable to distributional responses [85 84 163]. LSE can therefore be excluded.	**No**
		Changes in prey availability and behaviour (C, O, D)	While fulmar may also forage within the Project Area, the large foraging range of	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			this feature means that there is extensive alternative marine foraging habitat available. As such, it is highly unlikely that changes to prey availability in the vicinity of the Project would result in LSE for this feature at any time of year.	
		Collision risk (O)	Fulmar is not vulnerable to collision effects[85 86 163] as a high proportion of birds fly below the rotor swept area. LSE can therefore be excluded.	**No**
Flamborough and Filey Coast	Gannet	Disturbance from vessels (C, O, D)	The published foraging range of Gannet extends to the Array Area and ECC. Tracking studies of gannet in the UK have shown clear space partitioning of at sea foraging seas. Individuals tracked from this SPA do not closely interact with the Project. LSE can therefore be excluded[76].	**No**
		Distributional responses (O)	The published foraging range of Gannet extends to the Array Area and ECC. Tracking studies of gannet in the UK have shown clear space partitioning of at sea foraging seas. Individuals tracked from this SPA do not closely interact with the Project. LSE can therefore be excluded[166].	**No**
		Changes in prey availability and behaviour (C, O, D)	The published foraging range of Gannet extends to the Array Area and ECC. Tracking studies of gannet in the UK	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			have shown clear space partitioning of at sea foraging seas. Individuals tracked from this SPA do not closely interact with the Project. LSE can therefore be excluded[166].	
		Collision risk (O)	The published foraging range of Gannet extends to the Array Area and ECC. Tracking studies of gannet in the UK have shown clear space partitioning of at sea foraging seas. Individuals tracked from this SPA do not closely interact with the Project. LSE can therefore be excluded[166].	**No**
Rousay	Kittiwake	Disturbance from vessels (C, O, D)	Kittiwake are not considered to be highly sensitive to disturbance[163.] Considering that disturbance effects from vessels are likely be localised and temporary, LSE can be excluded.	**No**
		Distributional responses (O)	During the operation and maintenance phase, kittiwake foraging range does not extend to the Array Area during the breeding season. Components of the SPA population may however be present in the non-breeding season; LSE cannot therefore be excluded.	**Yes**
		Changes in prey availability and behaviour (C, O, D)	The presence of the Project does not have potential to impact the foraging of this species with limited effects predicted	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			on prey species and the project being sited away from core foraging areas.	
		Collision risk (O)	Kittiwake foraging range does not extend to the Array Area from this SPA in the breeding season. Kittiwake from this SPA may however pass through the Array Area in the non-breeding season; LSE cannot therefore be excluded.	**Yes**
	Fulmar	Disturbance from vessels (C, O, D)	Fulmar are not considered to be sensitive to disturbance[163.] Considering that disturbance effects from vessel are likely be localised and temporary, LSE can be excluded.	**No**
		Distributional responses (O)	While fulmar may forage within the Array Area, this species has a particularly large foraging range and therefore has extensive alternative marine habitats available. Fulmar is not highly vulnerable to distributional responses [85 84 163]. LSE can therefore be excluded.	**No**
		Changes in prey availability and behaviour (C, O, D)	While fulmar may also forage within the Project Area, the large foraging range of this feature means that there is extensive alternative marine foraging habitat available. As such, it is highly unlikely that changes to prey availability in the vicinity of the Project would result in LSE for this feature at any time of year.	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
		Collision risk (O)	Fulmar is not vulnerable to collision effects[85 86 163] as a high proportion of birds fly below the rotor swept area. LSE can therefore be excluded	**No**
West Westray	Kittiwake	Disturbance from vessels (C, O, D)	Kittiwake are not considered to be sensitive to disturbance[163.] Considering that disturbance effects from vessels are likely be localised and temporary, LSE can be excluded.	**No**
		Distributional responses (O)	During the operation and maintenance phase, kittiwake foraging range does not extend to the Array Area during the breeding season. Components of the SPA population may be present in the non-breeding season; LSE cannot therefore be excluded.	**Yes**
		Changes in prey availability and behaviour (C, O, D)	The presence of the Project does not have potential to impact the foraging of this species with limited effects predicted on prey species and the project being sited away from core foraging areas.	**No**
		Collision risk (O)	Kittiwake foraging range does not extend to the Array Area from this SPA in the breeding season. Kittiwake from this SPA may however pass through the Array Area in the non-breeding season; LSE cannot therefore be excluded.	**Yes**
	Fulmar	Disturbance from vessels (C, O, D)	Fulmar are not considered to be sensitive to disturbance[163.] Considering	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			that disturbance effects from vessel are likely be localised and temporary, LSE can be excluded.	
		Distributional responses (O)	While fulmar may forage within the Array Area, this species has a particularly large foraging range and therefore has extensive alternative marine habitats available. Fulmar is not highly vulnerable to distributional responses [85 84 163]. LSE can therefore be excluded.	**No**
		Changes in prey availability and behaviour (C, O, D)	While fulmar may also forage within the Project Area, the large foraging range of this feature means that there is extensive alternative marine foraging habitat available. As such, it is highly unlikely that changes to prey availability in the vicinity of the Project would result in LSE for this feature at any time of year.	**No**
		Collision risk (O)	Fulmar is not vulnerable to collision effects[85 86 163] as a high proportion of birds fly below the rotor swept area. LSE can therefore be excluded.	**No**
Marwick Head	Kittiwake	Disturbance from vessels (C, O, D)	Kittiwake are not considered to be highly sensitive to disturbance[163.] Considering that disturbance effects from vessels are likely be localised and temporary, LSE can be excluded.	**No**
		Distributional responses (O)	During the operation and maintenance phase, kittiwake foraging range does not	**Yes**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			extend to the Array Area during the breeding season. Components of the SPA population may be present in the non-breeding season; however, hence populations may be affected by disturbance/displacement or barrier effects from the presence of WTGs and regular maintenance activity with the Project. LSE cannot be excluded for these features during this phase of the Project.	
		Changes in prey availability and behaviour (C, O, D)	Presence of the Project does not have potential to impact the foraging of this species with limited effects predicted on prey species and the project being sited away from core foraging areas.	**No**
		Collision risk (O)	Kittiwake foraging range does not extend to the Array Area from this SPA in the breeding season. Kittiwake from this SPA may however pass through the Array Area in the non-breeding season. LSE cannot therefore be excluded.	**Yes**
	Guillemot	Disturbance from vessels (C, O, D)	Guillemot foraging range does not extend to the Array Area or the ECC in the breeding season. It is considered unlikely that components of the SPA population will be present in the non-breeding season. In any case, impacts from vessel activities are likely to be	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			localised and temporary, and with a considerable area of alternative habitat available, LSE can be excluded.	
		Distributional responses (O)	Guillemot foraging range does not extend to the Array Area in the breeding season. It is considered unlikely that components of the SPA population will be present in the non-breeding season. LSE cannot therefore be excluded.	**No**
		Changes in prey availability and behaviour (C, O, D)	The possibility of indirect effects from changes in prey abundance, availability and/or distribution can be excluded for Guillemot which is not in foraging range of the ECC or Array Area.	**No**
		Collision risk (O)	Guillemot are not vulnerable to collision events as they fly below the rotor swept area[85 86 163]. In any case, the foraging range of Guillemot is such that there is no connectivity with the Array Area in the breeding season. LSE can therefore be excluded.	**No**
Foula	Kittiwake	Disturbance from vessels (C, O, D)	Kittiwake are not considered to be highly sensitive to disturbance[163]. Considering that disturbance effects from vessels are likely be localised and temporary, LSE can be excluded.	**No**
		Distributional responses (O)	During the operation and maintenance phase, kittiwake foraging range does not	**Yes**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			extend to the Array Area during the breeding season. Components of the SPA population may be present in the non-breeding season. LSE cannot therefore be excluded.	
		Changes in prey availability and behaviour (C, O, D)	The presence of the Project does not have potential to impact the foraging of this species with limited effects predicted on prey species and the project being sited away from core foraging areas	**No**
		Collision risk (O)	Kittiwake foraging range does not extend to the Array Area from this SPA in the breeding season. Kittiwake from this SPA may however pass through the Array Area in the non-breeding season; LSE cannot therefore be excluded.	**Yes**
	Razorbill	Disturbance from vessels (C, O, D)	Razorbill foraging range does not extend to the Array Area or the ECC in the breeding season. While razorbill from this SPA may interact with the Project in the non-breeding season this is expected to be very limited in extent. Impacts from vessel activities are likely to be localised and temporary, and with a considerable area of alternative habitat available, LSE can be excluded.	**No**
		Distributional responses (O)	Razorbill foraging range does not extend to the Array Area in the breeding season, but limited components of the SPA	**Yes**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			population may be present in the non-breeding season. Razorbill may be sensitive to displacement effects during this period and LSE cannot therefore be excluded.	
		Changes in prey availability and behaviour (C, O, D)	The possibility of indirect effects from changes in prey abundance, availability and/or distribution can be excluded for Razorbill which is not in foraging range of the ECC or Array Area. Razorbill may pass through the site in the non-breeding season, however the extensive marine habitat available in this period means that LSE can be excluded.	**No**
		Collision risk (O)	Razorbill are not vulnerable to collision events as they fly below the rotor swept area[85 86 163]. In any case, the foraging range of razorbill is such that there is no connectivity with the Array Area in the breeding season. LSE can therefore be excluded.	**No**
	Puffin	Disturbance from vessels (C, O, D)	Puffin foraging range does not extend to the Array Area or the ECC in the breeding season. While puffin from this SPA may interact with the Project in the non-breeding season this is expected to be very limited in extent. Impacts from vessel activities are likely to be localised	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			and temporary, and with a considerable area of alternative habitat available, LSE can be excluded.	
		Distributional responses (O)	Puffin foraging range does not extend to the Array Area in the breeding season but limited components of the SPA population may be present in the non-breeding season. LSE cannot therefore be excluded.	**Yes**
		Changes in prey availability and behaviour (C, O, D)	The possibility of indirect effects from changes in prey abundance, availability and/or distribution can be excluded for puffin which is not in foraging range of the ECC or Array Area. Puffin may pass through the site in the non-breeding season, however the extensive marine habitat available in this period means that LSE can be excluded.	**No**
		Collision risk (O)	Puffin are not vulnerable to collision events as they fly below the rotor swept area[85 86 163]. In any case, the foraging range of puffin is such that there is no connectivity with the Array Area in the breeding season. LSE can therefore be excluded.	**No**
	Great skua	Disturbance from vessels (C, O, D)	Great skua are not considered to be highly sensitive to disturbance[163]. Considering that disturbance effects from	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			vessel are likely be localised and temporary, LSE can be excluded.	
		Distributional responses (O)	While great skua is within foraging range of the Array Area, this species has a particularly large foraging range and therefore has extensive alternative marine habitats available for foraging. LSE can be excluded.	**No**
		Changes in prey availability and behaviour (C, O, D)	While great skua is within foraging range of the Project Area, the large foraging range of this feature means that there is extensive alternative marine foraging habitat available. As such, it is highly unlikely that changes to prey availability in the vicinity of the Project would result in LSE for this feature at any time of year.	**No**
		Collision risk (O)	While great skua from this SPA are within foraging range of the Array Area, only two individuals were recorded in the DAS (and one within the Array Areas). LSE can therefore be excluded.	**No**
	Arctic skua	Disturbance from vessels (C, O, D)	Arctic skua are not considered to be highly sensitive to disturbance[163]. Considering that disturbance effects from vessel are likely be localised and temporary, LSE can be excluded.	**No**
		Distributional responses (O)	Arctic skua were recorded in very low numbers in DAS (two individuals) and	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			are not sensitive to distributional responses. LSE can be excluded.	
		Changes in prey availability and behaviour (C, O, D)	Arctic skua were recorded in very low numbers in DAS (two individuals) and will not be sensitive to any changes in prey availability. LSE can be excluded.	**No**
		Collision risk (O)	Arctic skua were recorded in very low numbers in DAS (two individuals). LSE can be excluded.	**No**
	Fulmar	Disturbance from vessels (C, O, D)	Fulmar are not considered to be sensitive to disturbance[163]. Considering that disturbance effects from vessel are likely be localised and temporary, LSE can be excluded.	**No**
		Distributional responses (O)	While fulmar may forage within the Array Area, this species has a particularly large foraging range and therefore has extensive alternative marine habitats available. Fulmar is not highly vulnerable to distributional responses [85] [84] [163]. LSE can therefore be excluded.	**No**
		Changes in prey availability and behaviour (C, O, D)	While fulmar may also forage within the Project Area, the large foraging range of this feature means that there is extensive alternative marine foraging habitat available. As such, it is highly unlikely that changes to prey availability in the vicinity of the Project would result in LSE for this feature at any time of year.	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
		Collision risk (O)	Fulmar is not vulnerable to collision effects[85 86 163] as a high proportion of birds fly below the rotor swept area. LSE can therefore be excluded.	**No**
Fetlar	Great skua	Disturbance from vessels (C, O, D)	Great skua are not considered to be highly sensitive to disturbance[163]. Considering that disturbance effects from vessel are likely be localised and temporary, LSE can be excluded.	**No**
		Distributional responses (O)	While great skua is within foraging range of the Array Area, this species has a particularly large foraging range and therefore has extensive alternative marine habitats available for foraging. LSE can be excluded.	**No**
		Changes in prey availability and behaviour (C, O, D)	While great skua is within foraging range of the Project Area, the large foraging range of this feature means that there is extensive alternative marine foraging habitat available. As such, it is highly unlikely that changes to prey availability in the vicinity of the Project would result in LSE for this feature at any time of year	**No**
		Collision risk (O)	While great skua from this SPA are within foraging range of the Array Area, only two individuals were recorded in the DAS (and one within the Array Areas). LSE can therefore be excluded.	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
	Arctic skua	Disturbance from vessels (C, O, D)	Arctic skua are not considered to be highly sensitive to disturbance[163]. Considering that disturbance effects from vessel are likely be localised and temporary, LSE can be excluded.	**No**
		Distributional responses (O)	Arctic skua were recorded in very low numbers in DAS (two individuals) and are not sensitive to distributional responses. LSE can be excluded.	**No**
		Changes in prey availability and behaviour (C, O, D)	Arctic skua were recorded in very low numbers in DAS (two individuals) and will not be sensitive to any changes in prey availability. LSE can be excluded.	**No**
		Collision risk (O)	Arctic skua were recorded in very low numbers in DAS (two individuals). LSE can be excluded.	**No**
	Fulmar	Disturbance from vessels (C, O, D)	Fulmar are not considered to be sensitive to disturbance[163]. Considering that disturbance effects from vessel are likely be localised and temporary, LSE can be excluded.	**No**
		Distributional responses (O)	While fulmar may forage within the Array Area, this species has a particularly large foraging range and therefore has extensive alternative marine habitats available. Fulmar is not highly vulnerable to distributional responses [85 84 163]. LSE can therefore be excluded.	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
		Changes in prey availability and behaviour (C, O, D)	While fulmar may also forage within the Project Area, the large foraging range of this feature means that there is extensive alternative marine foraging habitat available. As such, it is highly unlikely that changes to prey availability in the vicinity of the Project would result in LSE for this feature at any time of year.	**No**
		Collision risk (O)	Fulmar is not vulnerable to collision effects[85 86 163] as a high proportion of birds fly below the rotor swept area. LSE can therefore be excluded.	**No**
Cape Wrath	Kittiwake	Disturbance from vessels (C, O, D)	Kittiwake are not considered to be highly sensitive to disturbance[163]. Considering that disturbance effects from vessels are likely be localised and temporary, LSE can be excluded.	**No**
		Distributional responses (O)	During the operation and management phase, kittiwake foraging range does not extend to the Array Area during the breeding season. Components of the SPA population may be present in the non-breeding season however. LSE cannot therefore be excluded.	**Yes**
		Changes in prey availability and behaviour (C, O, D)	Presence of the Project does not have potential to impact the foraging of this species with limited effects predicted on prey species and the project being sited away from core foraging areas.	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
		Collision risk (O)	Kittiwake foraging range does not extend to the Array Area from this SPA in the breeding season. Kittiwake from this SPA may however pass through the Array Area in the non-breeding season; LSE cannot therefore be excluded.	**Yes**
	Puffin	Disturbance from vessels (C, O, D)	Puffin foraging range does not extend to the Array Area but does so to the ECC In addition, Puffin from this SPA may interact with the Array Area in the non-breeding season. While likely to be localised and temporary, there may be disturbance effects from vessel activities. LSE cannot be excluded.	**Yes**
		Distributional responses (O)	Puffin foraging range does not extend to the Array Area in the breeding season, but components of the SPA population may be present in the non-breeding season. LSE therefore cannot be excluded.	**Yes**
		Changes in prey availability and behaviour (C, O, D)	The presence of the Project does not have potential to impact the foraging of this species with limited effects predicted on prey species and the project being sited away from core foraging areas.	**No**
		Collision risk (O)	Puffin are not vulnerable to collision events as they fly below the rotor swept area[85 86 163].	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			In any case, the foraging range of puffin is such that there is no connectivity with the Array Area. LSE can be excluded.	
	Fulmar	Disturbance from vessels (C, O, D)	Fulmar are not considered to be sensitive to disturbance[163]. Considering that disturbance effects from vessel are likely be localised and temporary, LSE can be excluded.	**No**
		Distributional responses (O)	While fulmar may forage within the Array Area, this species has a particularly large foraging range and therefore has extensive alternative marine habitats available. Fulmar is not highly vulnerable to distributional responses [85 84 163]. LSE can therefore be excluded.	**No**
		Changes in prey availability and behaviour (C, O, D)	While fulmar may also forage within the Project Area, the large foraging range of this feature means that there is extensive alternative marine foraging habitat available. As such, it is highly unlikely that changes to prey availability in the vicinity of the Project would result in LSE for this feature at any time of year.	**No**
		Collision risk (O)	Fulmar is not vulnerable to collision effects[85 86 163] as a high proportion of birds fly below the rotor swept area. LSE can therefore be excluded.	**No**
North Rona and Sula Sgeir	Kittiwake	Disturbance from vessels (C, O, D)	Kittiwake are not considered to be highly sensitive to disturbance[163]. Considering	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			that disturbance effects from vessels are likely be localised and temporary, LSE can be excluded.	
		Distributional responses (O)	During the operation and management phase, kittiwake foraging range does not extend to the Array Area during the breeding season. Components of the SPA population may be present in the non-breeding season. LSE cannot therefore be excluded.	**Yes**
		Changes in prey availability and behaviour (C, O, D)	Presence of the Project does not have potential to impact the foraging of this species with limited effects predicted on prey species and the project being sited away from core foraging areas.	**No**
		Collision risk (O)	Kittiwake foraging range does not extend to the Array Area from this SPA in the breeding season. Kittiwake from this SPA may however pass through the Array Area in the non-breeding season; LSE cannot therefore be excluded.	**Yes**
	Gannet	Disturbance from vessels (C, O, D)	Foraging range of gannet extends to the Array Area and ECC. Gannet are however are not considered to be highly sensitive to disturbance[163.] Considering that disturbance effects from vessel are likely be localised and temporary, LSE can be excluded.	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
		Distributional responses (O)	Foraging range of gannet extends to the Array Area during the breeding season; hence populations may be affected by distributional responses. LSE cannot therefore be excluded.	**Yes**
		Changes in prey availability and behaviour (C, O, D)	The presence of the Project does not have potential to impact the foraging of this species with limited effects predicted on prey species and the project being sited away from core foraging areas.	**No**
		Collision risk (O)	There is potential for collision with WTGs for gannet, given its foraging range extends to the Array Area and may fly within the 'at risk' height range within the rotor swept area during the breeding and non-breeding season. LSE cannot be excluded.	**Yes**
	Fulmar	Disturbance from vessels (C, O, D)	Fulmar are not considered to be sensitive to disturbance[163]. Considering that disturbance effects from vessel are likely be localised and temporary, LSE can be excluded.	**No**
		Distributional responses (O)	While fulmar may forage within the Array Area, this species has a particularly large foraging range and therefore has extensive alternative marine habitats available. Fulmar is not highly vulnerable to distributional responses [85] [84] [163]. LSE can therefore be excluded.	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
		Changes in prey availability and behaviour (C, O, D)	While fulmar may also forage within the Project Area, the large foraging range of this feature means that there is extensive alternative marine foraging habitat available. As such, it is highly unlikely that changes to prey availability in the vicinity of the Project would result in LSE for this feature at any time of year.	**No**
		Collision risk (O)	Fulmar is not vulnerable to collision effects[85 86 163] as a high proportion of birds fly below the rotor swept area. LSE can therefore be excluded.	**No**
Ronas Hill – North Roe and Tingon	Great skua	Disturbance from vessels (C, O, D)	Great skua are not considered to be highly sensitive to disturbance[163]. Considering that disturbance effects from vessel are likely be localised and temporary, LSE can be excluded.	**No**
		Distributional responses (O)	While great skua is within foraging range of the Array Area, this species has a particularly large foraging range and therefore has extensive alternative marine habitats available for foraging. LSE can be excluded.	**No**
		Changes in prey availability and behaviour (C, O, D)	While great skua is within foraging range of the Project Area, the large foraging range of this feature means that there is extensive alternative marine foraging habitat available. As such, it is highly unlikely that changes to prey availability	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			in the vicinity of the Project would result in LSE for this feature at any time of year.	
		Collision risk (O)	While great skua from this SPA are within foraging range of the Array Area, only two individuals were recorded in the DAS (and one within the Array Areas). LSE can therefore be excluded.	**No**
Handa	Kittiwake	Disturbance from vessels (C, O, D)	Kittiwake are not considered to be highly sensitive to disturbance[163]. Considering that disturbance effects from vessels are likely be localised and temporary, LSE can be excluded.	**No**
		Distributional responses (O)	During the operation and management phase, kittiwake foraging range does not extend to the Array Area during the breeding season. Components of the SPA population may be present in the non-breeding season;. LSE cannot therefore be excluded for these features during this phase of the Project.	**Yes**
		Changes in prey availability and behaviour (C, O, D)	Presence of the Project does not have potential to impact the foraging of this species with limited effects predicted on prey species and the project being sited away from core foraging areas.	**No**
		Collision risk (O)	Kittiwake foraging range does not extend to the Array Area from this SPA in the breeding season. Kittiwake from this SPA	**Yes**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			may however pass through the Array Area in the non-breeding season; LSE cannot therefore be excluded.	
	Great skua	Disturbance from vessels (C, O, D)	Great skua are not considered to be highly sensitive to disturbance[163]. Considering that disturbance effects from vessel are likely be localised and temporary, LSE can be excluded.	**No**
		Distributional responses (O)	While Great Skua is within foraging range of the Array Area, this species has a particularly large foraging range and therefore has extensive alternative marine habitats available for foraging. LSE can be excluded.	**No**
		Changes in prey availability and behaviour (C, O, D)	While Great Skua is within foraging range of the Project Area, the large foraging range of this feature means that there is extensive alternative marine foraging habitat available. As such, it is highly unlikely that changes to prey availability in the vicinity of the Project would result in LSE for this feature.	**No**
		Collision risk (O)	While great skua from this SPA are within foraging range of the Array Area, only 2 individuals were recorded in the DAS (and one within the Array Areas). LSE can therefore be excluded.	**No**
	Fulmar	Disturbance from vessels (C, O, D)	Fulmar are not considered to be sensitive to disturbance[163]. Considering	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			that disturbance effects from vessel are likely be localised and temporary, LSE can be excluded.	
		Distributional responses (O)	While fulmar may forage within the Array Area, this species has a particularly large foraging range and therefore has extensive alternative marine habitats available. Fulmar is not highly vulnerable to distributional responses [85 84 163]. LSE can therefore be excluded.	**No**
		Changes in prey availability and behaviour (C, O, D)	While fulmar may also forage within the Project Area, the large foraging range of this feature means that there is extensive alternative marine foraging habitat available. As such, it is highly unlikely that changes to prey availability in the vicinity of the Project would result in LSE for this feature at any time of year.	**No**
		Collision risk (O)	Fulmar is not vulnerable to collision effects[85 86 163] as a high proportion of birds fly below the rotor swept area. LSE can therefore be excluded.	**No**
Hermaness, Saxa Vord and Valla Field	Kittiwake	Disturbance from vessels (C, O, D)	Kittiwake are not considered to be highly sensitive to disturbance[163]. Considering that disturbance effects from vessels are likely be localised and temporary, LSE can be excluded.	**No**
		Distributional responses (O)	During the operation and maintenance phase, kittiwake foraging range does not	**Yes**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			extend to the Array Area during the breeding season. Components of the SPA population may be present in the non-breeding season; however, hence populations may be affected by disturbance/displacement or barrier effects from the presence of WTGs and regular maintenance activity with the Project. LSE cannot be excluded for these features during this phase of the Project.	
		Changes in prey availability and behaviour (C, O, D)	The presence of the Project does not have potential to impact the foraging of this species with limited effects predicted on prey species and the project being sited away from core foraging areas.	**No**
		Collision risk (O)	Kittiwake foraging range does not extend to the Array Area from this SPA in the breeding season. Kittiwake from this SPA may however pass through the Array Area in the non-breeding season; LSE cannot therefore be excluded.	**Yes**
	Gannet	Disturbance from vessels (C, O, D)	Foraging range of gannet extends to the Array Area and ECC. Gannet are however are not considered to be highly sensitive to disturbance[163]. Considering that disturbance effects from vessel are likely be localised and temporary, LSE can be excluded.	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
		Distributional responses (O)	Foraging range of gannet extends to the Array Area during the breeding season; hence populations may be affected by distributional responses. LSE cannot therefore be excluded.	**Yes**
		Changes in prey availability and behaviour (C, O, D)	The presence of the Project does not have potential to impact the foraging of this species with limited effects predicted on prey species and the project being sited away from core foraging areas	**No**
		Collision risk (O)	There is potential for collision with WTGs for gannet, given its foraging range extends to the Array Area and may fly within the 'at risk' height range within the rotor swept area during the breeding and non-breeding season. LSE cannot be excluded.	**Yes**
	Puffin	Disturbance from vessels (C, O, D)	Puffin foraging range does not extend to the Array Area or the ECC in the breeding season. While puffin from this SPA may interact with the Project in the non-breeding season this is expected to be very limited in extent. Impacts from vessel activities are likely to be localised and temporary, and with a considerable area of alternative habitat available, LSE can be excluded.	**No**
		Distributional responses (O)	Puffin foraging range does not extend to the Array Area in the breeding season,	**Yes**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			but limited components of the SPA population may be present in the non-breeding season. Puffin may be sensitive to displacement effects during this period and LSE cannot therefore be excluded.	
		Changes in prey availability and behaviour (C, O, D)	The possibility of indirect effects from changes in prey abundance, availability and/or distribution can be excluded for Puffin which is not in foraging range of the ECC or Array Area. Puffin may pass through the site in the non-breeding season, however the extensive marine habitat available in this period means that LSE can be excluded.	**No**
		Collision risk (O)	Puffin are not vulnerable to collision events as they fly below the rotor swept area[85 86 163] In any case, the foraging range of puffin is such that there is no connectivity with the Array Area in the breeding season. LSE can therefore be excluded.	**No**
	Great skua	Disturbance from vessels (C, O, D)	Great skua are not considered to be highly sensitive to disturbance[163]. Considering that disturbance effects from vessel are likely be localised and temporary, LSE can be excluded.	**No**
		Distributional responses (O)	While great skua is within foraging range of the Array Area, this species has a particularly large foraging range and	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			therefore has extensive alternative marine habitats available for foraging. LSE can be excluded.	
		Changes in prey availability and behaviour (C, O, D)	While great skua is within foraging range of the Project Area, the large foraging range of this feature means that there is extensive alternative marine foraging habitat available. As such, it is highly unlikely that changes to prey availability in the vicinity of the Project would result in LSE for this feature at any time of year.	**No**
		Collision risk (O)	While great skua from this SPA are within foraging range of the Array Area, only 2 individuals were recorded in the DAS (and one within the Array Areas). LSE can therefore be excluded.	**No**
	Fulmar	Disturbance from vessels (C, O, D)	Fulmar are not considered to be sensitive to disturbance[163]. Considering that disturbance effects from vessel are likely be localised and temporary, LSE can be excluded.	**No**
		Distributional responses (O)	While fulmar may forage within the Array Area, this species has a particularly large foraging range and therefore has extensive alternative marine habitats available. Fulmar is not highly vulnerable to distributional responses [85 84 163]. LSE can therefore be excluded.	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
		Changes in prey availability and behaviour (C, O, D)	While fulmar may also forage within the Project Area, the large foraging range of this feature means that there is extensive alternative marine foraging habitat available. As such, it is highly unlikely that changes to prey availability in the vicinity of the Project would result in LSE for this feature at any time of year.	**No**
		Collision risk (O)	Fulmar is not vulnerable to collision effects[85 86 163] as a high proportion of birds fly below the rotor swept area. LSE can therefore be excluded.	**No**
Shiant Isles	Kittiwake	Disturbance from vessels (C, O, D)	Kittiwake are not considered to be highly sensitive to disturbance[163]. Considering that disturbance effects from vessels are likely be localised and temporary, LSE can be excluded.	**No**
		Distributional responses (O)	During the operation and management phase, kittiwake foraging range does not extend to the Array Area during the breeding season. Components of the SPA population may be present in the non-breeding season however. LSE cannot therefore be excluded.	**Yes**
		Changes in prey availability and behaviour (C, O, D)	The presence of the Project does not have potential to impact the foraging of this species with limited effects predicted on prey species and the project being sited away from core foraging areas	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
		Collision risk (O)	Kittiwake foraging range does not extend to the Array Area from this SPA in the breeding season. Kittiwake from this SPA may however pass through the Array Area in the non-breeding season; LSE cannot therefore be excluded.	**Yes**
	Fulmar	Disturbance from vessels (C, O, D)	Fulmar are not considered to be sensitive to disturbance[163]. Considering that disturbance effects from vessel are likely be localised and temporary, LSE can be excluded.	**No**
		Distributional responses (O)	While fulmar may forage within the Array Area, this species has a particularly large foraging range and therefore has extensive alternative marine habitats available. Fulmar is not highly vulnerable to distributional responses [85 84 163]. LSE can therefore be excluded.	**No**
		Changes in prey availability and behaviour (C, O, D)	While fulmar may also forage within the Project Area, the large foraging range of this feature means that there is extensive alternative marine foraging habitat available. As such, it is highly unlikely that changes to prey availability in the vicinity of the Project would result in LSE for this feature at any time of year.	**No**
		Collision risk (O)	Fulmar is not highly vulnerable to collision effects[85 86 163] as a high proportion of birds fly below the rotor	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			swept area. LSE can therefore be excluded.	
Sule Skerry and Sule Stack	Puffin	Disturbance from vessels (C, O, D)	Puffin foraging range does not extend to the Array Area but does so to the ECC. Considering the distance to the Array Area it is considered unlikely that there will be interaction in the non-breeding season. In addition, the impacts are likely to be localised and temporary, there may be disturbance effects from vessel activities. LSE cannot be excluded.	**No**
		Distributional responses (O)	Puffin foraging range does not extend to the Array Area in the breeding season. Considering the distance to the Array Area it is considered unlikely that there will be interaction in the non-breeding season. LSE can be excluded	**No**
		Changes in prey availability and behaviour (C, O, D)	The presence of the Project does not have potential to impact the foraging of this species with limited effects predicted on prey species and the project being sited away from core foraging areas. LSE can be excluded.	**No**
		Collision risk (O)	Puffin are not vulnerable to collision events as they fly below the rotor swept area[85 86 163].	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			In any case, the foraging range of Puffin is such that there is no connectivity with the Array Area.	
	Gannet	Disturbance from vessels (C, O, D)	Tracking data of gannet from this SPA has shown no interaction with the Projects region[166]. LSE can be excluded.	**No**
		Distributional responses (O)	Tracking data of gannet from this SPA has shown no interaction with the Projects region[166166]. LSE can be excluded.	**No**
		Changes in prey availability and behaviour (C, O, D)	Tracking data of gannet from this SPA has shown no interaction with the Projects region[166166]. LSE can be excluded.	**No**
		Collision risk (O)	Tracking data of gannet from this SPA has shown no interaction with the Projects region[166166]. LSE can be excluded.	**No**
Flannan Isles	Fulmar	Disturbance from vessels (C, O, D)	Fulmar are not considered to be sensitive to disturbance[163]. Considering that disturbance effects from vessel are likely be localised and temporary, LSE can be excluded.	**No**
		Distributional responses (O)	While fulmar may forage within the Array Area, this species has a particularly large foraging range and therefore has extensive alternative marine habitats available. Fulmar is not highly vulnerable	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			to distributional responses [85 84 163]. LSE can therefore be excluded.	
		Changes in prey availability and behaviour (C, O, D)	While fulmar may also forage within the Project Area, the large foraging range of this feature means that there is extensive alternative marine foraging habitat available. As such, it is highly unlikely that changes to prey availability in the vicinity of the Project would result in LSE for this feature at any time of year.	**No**
		Collision risk (O)	Fulmar is not vulnerable to collision effects[85 86 163] as a high proportion of birds fly below the rotor swept area. LSE can therefore be excluded.	**No**
Noss	Kittiwake	Disturbance from vessels (C, O, D)	Kittiwake are not considered to be highly sensitive to disturbance[163]. Considering that disturbance effects from vessels are likely be localised and temporary, LSE can be excluded.	**No**
		Distributional responses (O)	During the operation and maintenance phase, kittiwake foraging range does not extend to the Array Area during the breeding season. Components of the SPA population may be present in the non-breeding season however. LSE cannot therefore be excluded.	**Yes**
		Changes in prey availability and behaviour (C, O, D)	The presence of the Project does not have potential to impact the foraging of this species with limited effects predicted	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			on prey species and the project being sited away from core foraging areas. LSE can be excluded.	
		Collision risk (O)	Kittiwake foraging range does not extend to the Array Area from this SPA in the breeding season. Kittiwake from this SPA may however pass through the Array Area in the non-breeding season. LSE cannot therefore be excluded.	**Yes**
	Gannet	Disturbance from vessels (C, O, D)	Foraging range of Gannet extends to the Array Area and ECC. Gannet are however are not considered to be highly sensitive to disturbance[163]. Considering that disturbance effects from vessel are likely be localised and temporary, LSE can be excluded.	**No**
		Distributional responses (O)	Foraging range of gannet extends to the Array Area during the breeding season; hence populations may be affected by distributional responses. LSE cannot therefore be excluded.	**Yes**
		Changes in prey availability and behaviour (C, O, D)	The presence of the Project does not have potential to impact the foraging of this species with limited effects predicted on prey species and the project being sited away from core foraging areas. LSE can be excluded.	**No**
		Collision risk (O)	There is potential for collision with WTGs for gannet, given its foraging range	**Yes**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			extends to the Array Area and may fly within the 'at risk' height range within the rotor swept area during the breeding and non-breeding season. LSE cannot be excluded.	
	Great skua	Disturbance from vessels (C, O, D)	Great skua are not considered to be highly sensitive to disturbance[163]. Considering that disturbance effects from vessel are likely be localised and temporary, LSE can be excluded.	**No**
		Distributional responses (O)	While great skua is within foraging range of the Array Area, this species has a particularly large foraging range and therefore has extensive alternative marine habitats available for foraging. LSE can be excluded.	**No**
		Changes in prey availability and behaviour (C, O, D)	While great skua is within foraging range of the Project Area, the large foraging range of this feature means that there is extensive alternative marine foraging habitat available. As such, it is highly unlikely that changes to prey availability in the vicinity of the Project would result in LSE for this feature.	**No**
		Collision risk (O)	While great skua from this SPA are within foraging range of the Array Area, only two individuals were recorded in the DAS (and one within the Array Areas). LSE can therefore be excluded.	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
	Fulmar	Disturbance from vessels (C, O, D)	Fulmar are not considered to be sensitive to disturbance[163]. Considering that disturbance effects from vessel are likely be localised and temporary, LSE can be excluded.	**No**
		Distributional responses (O)	While fulmar may forage within the Array Area, this species has a particularly large foraging range and therefore has extensive alternative marine habitats available. Fulmar is not highly vulnerable to distributional responses [85 84 163]. LSE can therefore be excluded.	**No**
		Changes in prey availability and behaviour (C, O, D)	While fulmar may also forage within the Project Area, the large foraging range of this feature means that there is extensive alternative marine foraging habitat available. As such, it is highly unlikely that changes to prey availability in the vicinity of the Project would result in LSE for this feature at any time of year.	**No**
		Collision risk (O)	Fulmar is not vulnerable to collision effects[85 86 163] as a high proportion of birds fly below the rotor swept area. LSE can therefore be excluded.	**No**
St. Kilda	Fulmar	Disturbance from vessels (C, O, D)	Fulmar are not considered to be sensitive to disturbance[163]. Considering that disturbance effects from vessel are likely be localised and temporary, LSE can be excluded.	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
		Distributional responses (O)	While fulmar may forage within the Array Area, this species has a particularly large foraging range and therefore has extensive alternative marine habitats available. Fulmar is not highly vulnerable to distributional responses [85 84 163]. LSE can therefore be excluded.	**No**
		Changes in prey availability and behaviour (C, O, D)	While fulmar may also forage within the Project Area, the large foraging range of this feature means that there is extensive alternative marine foraging habitat available. As such, it is highly unlikely that changes to prey availability in the vicinity of the Project would result in LSE for this feature at any time of year.	**No**
		Collision risk (O)	Fulmar is not vulnerable to collision effects[85 86 163] as a high proportion of birds fly below the rotor swept area. LSE can therefore be excluded.	**No**
	Gannet	Disturbance from vessels (C, O, D)	Foraging range of Gannet extends to the Array Area and ECC. Gannet are however are not considered to be highly sensitive to disturbance[163]. Considering that disturbance effects from vessel are likely be localised and temporary, LSE can be excluded.	**No**
		Distributional responses (O)	Foraging range of gannet extends to the Array Area during the breeding season; hence populations may be affected by	**Yes**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			distributional responses. LSE cannot therefore be excluded.	
		Changes in prey availability and behaviour (C, O, D)	The presence of the Project does not have potential to impact the foraging of this species with limited effects predicted on prey species and the project being sited away from core foraging areas. LSE can be excluded.	**No**
		Collision risk (O)	There is potential for collision with WTGs for gannet, given its foraging range extends to the Array Area and may fly within the 'at risk' height range within the rotor swept area during the breeding and non-breeding season. LSE cannot be excluded.	**Yes**
	Great skua	Disturbance from vessels (C, O, D)	Great skua are not considered to be highly sensitive to disturbance[163]. Considering that disturbance effects from vessel are likely be localised and temporary, LSE can be excluded.	**No**
		Distributional responses (O)	While great skua is within foraging range of the Array Area, this species has a particularly large foraging range and therefore has extensive alternative marine habitats available for foraging. LSE can be excluded.	**No**
		Changes in prey availability and behaviour (C, O, D)	While great skua is within foraging range of the Project Area, the large foraging range of this feature means that there is	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			extensive alternative marine foraging habitat available. As such, it is highly unlikely that changes to prey availability in the vicinity of the Project would result in LSE for this feature at any time of year.	
		Collision risk (O)	While great skua from this SPA are within foraging range of the Array Area, only two individuals were recorded in the DAS (and one within the Array Areas). LSE can therefore be excluded.	**No**
Mingulay and Berneray	Fulmar	Disturbance from vessels (C, O, D)	Fulmar are not considered to be sensitive to disturbance[163]. Considering that disturbance effects from vessel are likely be localised and temporary, In addition it is considered highly unlikely that fulmar from this SPA will interact with the Project due to the 'at sea' distance between them[79 36 167 168 169]. LSE can therefore be excluded.	**No**
		Distributional responses (O)	It is considered highly unlikely that fulmar from this SPA will interact with the Project due to the 'at sea' distance between them[79 36 167 168 169]. LSE can therefore be excluded.	**No**
		Changes in prey availability and behaviour (C, O, D)	It is considered highly unlikely that fulmar from this SPA will interact with the Project due to the 'at sea' distance	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			between them[79 36 167 168 169]. LSE can therefore be excluded.	
		Collision risk (O)	Fulmar is not vulnerable to collision effects[85 86 163]as a high proportion of birds fly below the rotor swept area. LSE can therefore be excluded.	**No**
Ailsa Craig	Gannet	Disturbance from vessels (C, O, D)	Tracking data of gannet from this SPA has shown no interaction with the Projects region[170]. LSE can be excluded.	**No**
		Distributional responses (O)	Tracking data of gannet from this SPA has shown no interaction with the Projects region[170]. LSE can be excluded.	**No**
		Changes in prey availability and behaviour (C, O, D)	Tracking data of gannet from this SPA has shown no interaction with the Projects region[170]. LSE can be excluded.	**No**
		Collision risk (O)	Tracking data of gannet from this SPA has shown no interaction with the Projects region[170]. LSE can be excluded.	**No**
		Disturbance from vessels (C, O, D)	Tracking data of gannet from this SPA has shown no interaction with the Projects region[170]. LSE can be excluded.	**No**
Loch of Skene	Greylag goose Goldeneye Goosander	Disturbance from vessels (C, O, D)	The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.	**No**
		Distributional responses (O)	The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			will be unaffected by distributional responses.	
		Changes in prey availability and behaviour (C, O, D)	The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore LSE can be excluded.	**No**
		Collision risk (O)	c Collision Risk The MSS strategic assessment report[155] concluded that at a strategic level, the populations of non-seabird species which pass through Scottish waters do not appear to be at risk of significant levels of additional mortality due to collisions with Scottish offshore windfarms. It is however evident the number of offshore wind projects and therefore the number of WTGs has increased notably since the publication of the MSS report. An update to the collision risk for migrating birds in Scottish waters was completed by the British Trust for Ornithology in 2023[164]. A CRM specifically for migratory birds is not currently available and Woodward et al. [131] outline the scope of a stochastic tool that will be part of a subsequent work package.	**Yes**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			The Array Area is considerably offshore, located approximately 185 km offshore east of Aberdeen, and it is considered likely that interactions with migratory birds will be limited. However, considering that Woodward et al. [131] outlines that there is, to some degree, potential connectivity with goldeneye and goosander. Therefore, LSE cannot be excluded. There is considered to be no connectivity with greylag goose migratory routes and LSE is excluded.	
Cameron Reservoir	Pink-footed goose	Disturbance from vessels (C, O, D)	The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.	**No**
		Distributional responses (O)	The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by distributional responses.	**No**
		Changes in prey availability and behaviour (C, O, D)	The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore LSE can be excluded.	**No**
		Collision risk (O)	The MSS strategic assessment report[155] concluded that at a strategic level, the populations of non-seabird species	**Yes**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			which pass through Scottish waters do not appear to be at risk of significant levels of additional mortality due to collisions with Scottish offshore windfarms. It is however evident the number of offshore wind projects and therefore the number of WTGs has increased notably since the publication of the MSS report, A update to the collision risk for migrating birds in Scottish waters was completed by the British Trust for Ornithology in 2023[164164.] A CRM specifically for migratory birds is not currently available and Woodward *et al.*[164] outline the scope of a stochastic tool that will be part of a subsequent work package. The Cenos Array Area is considerably offshore, and it is considered likely that interactions with migratory birds will be limited. However, considering that Woodward *et al.*[164] outlines that there is, to some degree, potential connectivity with migratory pink-footed goose, LSE cannot be excluded.	
Montrose Basin	Pink-footed goose Greylag goose Redshank	Disturbance from vessels (C, O, D)	The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
	Oystercatcher Eider Wigeon Knot Dunlin Shelduck		will be unaffected by this impact. LSE can be excluded.	
		Distributional responses (O)	The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by distributional responses.	**No**
		Changes in prey availability and behaviour (C, O, D)	The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore LSE can be excluded.	**No**
		Collision risk (O)	The MSS strategic assessment report[155] concluded that at a strategic level, the populations of non-seabird species which pass through Scottish waters do not appear to be at risk of significant levels of additional mortality due to collisions with Scottish offshore windfarms. It is however evident the number of offshore wind projects and therefore the number of WTGs has increased notably since the publication of the MSS report, A update to the collision risk for migrating birds in Scottish waters was completed by the British Trust for Ornithology in 2023[164164.] A CRM specifically for migratory birds is not currently available and Woodward *et al.* [151164] outline the	**Yes**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			scope of a stochastic tool that will be part of a subsequent work package. The Cenos Array Area is considerably offshore, and it is considered likely that interactions with migratory birds will be limited. However, considering that Woodward *et al.* [164] outlines that there is, to some degree, potential connectivity all species from this SPA (excluding greylag goose), LSE cannot be excluded.	
Moray Firth	Great northern diver Red-throated diver Slavonian grebe Scaup Eider Long-tailed duck Common scoter Velvet scoter Goldeneye Red-breasted merganser Shag	Disturbance from vessels (C, O, D)	The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.	**No**
		Distributional responses (O)	The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by distributional responses.	**No**
		Changes in prey availability and behaviour (C, O, D)	The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore LSE can be excluded.	**No**
		Collision risk (O)	The MSS strategic assessment report[155] concluded that at a strategic level, the populations of non-seabird species which pass through Scottish waters do not appear to be at risk of significant	**Yes**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			levels of additional mortality due to collisions with Scottish offshore windfarms. It is however evident the number of offshore wind projects and therefore the number of WTGs has increased notably since the publication of the MSS report, A update to the collision risk for migrating birds in Scottish waters was completed by the British Trust for Ornithology in 2023[164164]. A CRM specifically for migratory birds is not currently available and Woodward *et al.* [131164] outline the scope of a stochastic tool that will be part of a subsequent work package. The Cenos Array Area is considerably offshore, and it is considered likely that interactions with migratory birds will be limited. However, considering that Woodward *et al.* [131 164] outlines that there is, to some degree, potential connectivity with all the species from this SPA (with the exception of shag), LSE cannot be excluded.	
Firth of Tay and Eden Estuary	Bar-tailed godwit Redshank Greylag goose Pink-footed goose Velvet scoter	Disturbance from vessels (C, O, D)	The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
	Shelduck Eider Common scoter Black-tailed godwit Goldeneye Red-breasted merganser Goosander Oystercatcher Grey plover Sanderling Dunlin Long-tailed duck	Distributional responses (O)	The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by distributional responses.	**No**
		Changes in prey availability and behaviour (C, O, D)	The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore LSE can be excluded.	**No**
		Collision risk (O)	The MSS strategic assessment report[155] concluded that at a strategic level, the populations of non-seabird species which pass through Scottish waters do not appear to be at risk of significant levels of additional mortality due to collisions with Scottish offshore windfarms. It is however evident the number of offshore wind projects and therefore the number of WTGs has increased notably since the publication of the MSS report, A update to the collision risk for migrating birds in Scottish waters was completed by the British Trust for Ornithology in 2023[164164]. A CRM specifically for migratory birds is not currently available and Woodward *et al.*[164] outline the scope of a stochastic tool that will be part of a subsequent work package.	**Yes**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			The Cenos Array Area is considerably offshore, and it is considered likely that interactions with migratory birds will be limited. However, considering that Woodward *et al.*[164] outlines that there is, to some degree, potential connectivity all the species from this SPA (with the exception of greylag goose), LSE cannot be excluded.	
Firth of Forth	Red-throated diver Slavonian grebe Golden plover Bar-tailed godwit Pink-footed goose Shelduck Knot Redshank Turnstone Scaup Great crested grebe Cormorant Curlew Eider Long-tailed duck Common scoter Velvet scoter Goldeneye Red-breasted merganser	Disturbance from vessels (C, O, D)	The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.	**No**
		Distributional responses (O)	The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by distributional responses.	**No**
		Direct disturbance and displacement during construction and decommissioning (C/D)	The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by any disturbance	**No**
		Collision risk (O)	The MSS strategic assessment report[155] concluded that at a strategic level, the populations of non-seabird species which pass through Scottish waters do not appear to be at risk of significant levels of additional mortality due to	**Yes**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
	Oystercatcher Ringed plover Grey plover Dunlin Mallard Lapwing Wigeon		collisions with Scottish offshore windfarms. It is however evident the number of offshore wind projects and therefore the number of WTGs has increased notably since the publication of the MSS report, A update to the collision risk for migrating birds in Scottish waters was completed by the British Trust for Ornithology in 2023[164164]. A CRM specifically for migratory birds is not currently available and Woodward *et al*. [131164] outline the scope of a stochastic tool that will be part of a subsequent work package. The Cenos Array Area is considerably offshore, and it is considered likely that interactions with migratory birds will be limited. However, considering that Woodward *et al.* [131164] outlines that there is, to some degree, potential connectivity with all species from this SPA (excluding cormorant), LSE cannot be excluded.	
Moray and Nairn Coast	Bar-tailed godwit Pink-footed goose Greylag goose Redshank Red-breasted merganser Dunlin	Disturbance from vessels (C, O, D)	The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.	**No**
		Distributional responses (O)	The migratory waterbirds from this SPA will not utilise habitat in the marine	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
	Oystercatcher Wigeon		environment for foraging and therefore will be unaffected by distributional responses.	
		Changes in prey availability and behaviour (C, O, D)	The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore LSE can be excluded.	**No**
		Collision risk (O)	The MSS strategic assessment report [155] concluded that at a strategic level, the populations of non-seabird species which pass through Scottish waters do not appear to be at risk of significant levels of additional mortality due to collisions with Scottish offshore windfarms. It is however evident the number of offshore wind projects and therefore the number of WTGs has increased notably since the publication of the MSS report, A update to the collision risk for migrating birds in Scottish waters was completed by the British Trust for Ornithology in 2023[164]. A CRM specifically for migratory birds is not currently available and Woodward *et al*. [164] outline the scope of a stochastic tool that will be part of a subsequent work package. The Cenos Array Area is considerably offshore, and it is considered likely that	**Yes**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			interactions with migratory birds will be limited. However, considering that Woodward *et al.* [164] outlines that there is, to some degree, potential connectivity with all species from this SPA (excluding greylag goose), LSE cannot be excluded.	
Loch of Kinnordy	Greylag goose Pink-footed goose	Disturbance from vessels (C, O, D)	The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.	**No**
		Distributional responses (O)	The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by distributional responses.	**No**
		Changes in prey availability and behaviour (C, O, D)	The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore LSE can be excluded.	**No**
		Collision risk (O)	The MSS strategic assessment report[155] concluded that at a strategic level, the populations of non-seabird species which pass through Scottish waters do not appear to be at risk of significant levels of additional mortality due to collisions with Scottish offshore windfarms.	**Yes**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			It is however evident the number of offshore wind projects and therefore the number of WTGs has increased notably since the publication of the MSS report, A update to the collision risk for migrating birds in Scottish waters was completed by the British Trust for Ornithology in 2023[164.] A CRM specifically for migratory birds is not currently available and Woodward *et al*. [164] outline the scope of a stochastic tool that will be part of a subsequent work package. The Cenos Array Area is considerably offshore, and it is considered likely that interactions with migratory birds will be limited. However, considering that Woodward *et al.* [164] that there is, to some degree, potential connectivity with migratory pink-footed goose, LSE cannot be excluded. There is considered to be no connectivity with greylag goose migratory routes and LSE is excluded.	
Greenlaw Moor	Pink-footed goose	Disturbance from vessels (C, O, D)	The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.	**No**
		Distributional responses (O)	The migratory waterbirds from this SPA will not utilise habitat in the marine	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			environment for foraging and therefore will be unaffected by distributional responses.	
		Changes in prey availability and behaviour (C, O, D)	The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore LSE can be excluded.	**No**
		Collision risk (O)	The MSS strategic assessment report[155] concluded that at a strategic level, the populations of non-seabird species which pass through Scottish waters do not appear to be at risk of significant levels of additional mortality due to collisions with Scottish offshore windfarms. It is however evident the number of offshore wind projects and therefore the number of WTGs has increased notably since the publication of the MSS report, A update to the collision risk for migrating birds in Scottish waters was completed by the British Trust for Ornithology in 2023[164.] A CRM specifically for migratory birds is not currently available and Woodward *et al*. [164] outline the scope of a stochastic tool that will be part of a subsequent work package. The Cenos Array Area is considerably offshore, and it is considered likely that	**Yes**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			interactions with migratory birds will be limited. However, considering that Woodward *et al.* [164] outlines that there is, to some degree, potential connectivity with migratory pink-footed goose, LSE cannot be excluded.	
Din Moss – Hoselaw Loch	Greylag goose Pink-footed goose	Disturbance from vessels (C, O, D)	The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.	**No**
		Distributional responses (O)	The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by distributional responses.	**No**
		Changes in prey availability and behaviour (C, O, D)	The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore LSE can be excluded.	**No**
		Collision risk (O)	The MSS strategic assessment report [155] concluded that at a strategic level, the populations of non-seabird species which pass through Scottish waters do not appear to be at risk of significant levels of additional mortality due to collisions with Scottish offshore windfarms.	**Yes**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			It is however evident the number of offshore wind projects and therefore the number of WTGs has increased notably since the publication of the MSS report, A update to the collision risk for migrating birds in Scottish waters was completed by the British Trust for Ornithology in 2023[164.] A CRM specifically for migratory birds is not currently available and Woodward *et al*. [164] outline the scope of a stochastic tool that will be part of a subsequent work package. The Array Area is located approximately 185 km offshore east of Aberdeen, and it is considered likely that interactions with migratory birds will be limited. However, considering that Woodward et al. outlines that there is, to some degree, potential connectivity with migratory pink-footed goose, LSE cannot be excluded. There is considered to be no connectivity with greylag goose migratory routes and LSE is excluded.	
Loch Spynie	Greylag goose	Disturbance from vessels (C, O, D)	The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
		Distributional responses (O)	The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by distributional responses.	**No**
		Direct disturbance and displacement during construction and decommissioning (C/D)	The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by any disturbance.	**No**
		Collision risk (O)	The MSS strategic assessment report[155] concluded that at a strategic level, the populations of non-seabird species which pass through Scottish waters do not appear to be at risk of significant levels of additional mortality due to collisions with Scottish offshore windfarms. It is however evident the number of offshore wind projects and therefore the number of WTGs has increased notably since the publication of the MSS report, A update to the collision risk for migrating birds in Scottish waters was completed by the British Trust for Ornithology in 2023[164]. A CRM specifically for migratory birds is not currently available and Woodward *et al*. [164] outline the scope of a stochastic tool that will be part of a subsequent work package.	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			The Cenos Array Area is considerably offshore, and it is considered likely that interactions with migratory birds will be limited. Woodward *et al.*[164] outline that there is no potential connectivity between the Projects Array Area and greylag goose migratory routes. LSE can therefore be excluded.	
Caithness Lochs	Whooper swan Greenland white-fronted goose Greylag goose	Disturbance from vessels (C, O, D)	The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.	**No**
		Distributional responses (O)	The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by distributional responses.	**No**
		Changes in prey availability and behaviour (C, O, D)	The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore LSE can be excluded.	**No**
		Collision risk (O)	The MSS strategic assessment report[155] concluded that at a strategic level, the populations of non-seabird species which pass through Scottish waters do not appear to be at risk of significant levels of additional mortality due to	**Yes**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			collisions with Scottish offshore windfarms. It is however evident the number of offshore wind projects and therefore the number of WTGs has increased notably since the publication of the MSS report, A update to the collision risk for migrating birds in Scottish waters was completed by the British Trust for Ornithology in 2023[164]. A CRM specifically for migratory birds is not currently available and Woodward *et al*. [164] outline the scope of a stochastic tool that will be part of a subsequent work package. The Cenos Array Area is considerably offshore, and it is considered likely that interactions with migratory birds will be limited. However, considering that Woodward *et al.* [164] outlines that there is, to some degree, potential connectivity with whooper swan (although not Greenland white-fronted goose or greylag goose) from this SPA, LSE cannot be excluded.	
Loch Leven	Whooper swan Pink-footed goose Shoveler Cormorant Gadwall	Disturbance from vessels (C, O, D)	The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
	Teal Pochard Tufted duck Goldeneye	Distributional responses (O)	The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by distributional responses.	**No**
		Changes in prey availability and behaviour (C, O, D)	The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore LSE can be excluded.	**No**
		Collision risk (O)	The MSS strategic assessment report[155] concluded that at a strategic level, the populations of non-seabird species which pass through Scottish waters do not appear to be at risk of significant levels of additional mortality due to collisions with Scottish offshore windfarms. It is however evident the number of offshore wind projects and therefore the number of WTGs has increased notably since the publication of the MSS report, A update to the collision risk for migrating birds in Scottish waters was completed by the British Trust for Ornithology in 2023[164.] A CRM specifically for migratory birds is not currently available and Woodward *et al*.[164] outline the scope of a stochastic tool that will be part of a subsequent work package.	**Yes**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			The Cenos Array Area is considerably offshore, and it is considered likely that interactions with migratory birds will be limited. However, considering that Woodward *et al.* [164] outlines that there is, to some degree, potential connectivity with all species from this SPA (cormorant excepted), LSE cannot be excluded.	
South Tayside Goose Roosts	Wigeon Pink-footed goose Greylag goose	Disturbance from vessels (C, O, D)	The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.	**No**
		Distributional responses (O)	The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by distributional responses.	**No**
		Changes in prey availability and behaviour (C, O, D)	The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore LSE can be excluded.	**No**
		Collision risk (O)	The MSS strategic assessment report[155] concluded that at a strategic level, the populations of non-seabird species which pass through Scottish waters do not appear to be at risk of significant levels of additional mortality due to	**Yes**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			collisions with Scottish offshore windfarms. It is however evident the number of offshore wind projects and therefore the number of WTGs has increased notably since the publication of the MSS report, A update to the collision risk for migrating birds in Scottish waters was completed by the British Trust for Ornithology in 2023[164]. A CRM specifically for migratory birds is not currently available and Woodward *et al*. [164] outline the scope of a stochastic tool that will be part of a subsequent work package. The Cenos Array Area is considerably offshore, and it is considered likely that interactions with migratory birds will be limited. However, considering that Woodward *et al.* [164] outlines that there is, to some degree, potential connectivity with all species from this SPA (greylag goose excepted), LSE cannot be excluded.	
Dornoch Firth and Loch Fleet	Bar-tailed godwit Greylag goose Wigeon Curlew Teal	Disturbance from vessels (C, O, D)	The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
	Scaup Redshank Dunlin Oystercatcher	Distributional responses (O)	The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by distributional responses.	**No**
		Changes in prey availability and behaviour (C, O, D)	The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore LSE can be excluded.	**No**
		Collision risk (O)	The MSS strategic assessment report[155] concluded that at a strategic level, the populations of non-seabird species which pass through Scottish waters do not appear to be at risk of significant levels of additional mortality due to collisions with Scottish offshore windfarms. It is however evident the number of offshore wind projects and therefore the number of WTGs has increased notably since the publication of the MSS report, A update to the collision risk for migrating birds in Scottish waters was completed by the British Trust for Ornithology in 2023[164]. A CRM specifically for migratory birds is not currently available and Woodward *et al*. [164] outline the scope of a stochastic tool that will be part of a subsequent work package.	**Yes**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			The Cenos Array Area is considerably offshore, and it is considered likely that interactions with migratory birds will be limited. However, considering that Woodward *et al.* [164] outlines that there is, to some degree, potential connectivity with all species from this SPA (greylag goose excepted), LSE cannot be excluded.	
East Sanday Coast	Bar-tailed godwit Purple sandpiper Turnstone	Disturbance from vessels (C, O, D)	The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.	**No**
		Distributional responses (O)	The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by distributional responses.	**No**
		Changes in prey availability and behaviour (C, O, D)	The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore LSE can be excluded.	**No**
		Collision risk (O)	The MSS strategic assessment report[155] concluded that at a strategic level, the populations of non-seabird species which pass through Scottish waters do not appear to be at risk of significant levels of additional mortality due to	**Yes**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			collisions with Scottish offshore windfarms. It is however evident the number of offshore wind projects and therefore the number of WTGs has increased notably since the publication of the MSS report, A update to the collision risk for migrating birds in Scottish waters was completed by the British Trust for Ornithology in 2023[164]. A CRM specifically for migratory birds is not currently available and Woodward *et al*. [164] outline the scope of a stochastic tool that will be part of a subsequent work package. The Cenos Array Area is considerably offshore, and it is considered likely that interactions with migratory birds will be limited. However, considering that Woodward *et al.* [164] outlines that there is, to some degree, potential connectivity with all species from this SPA, LSE cannot be excluded.	
Loch Ashie	Slavonian Grebe	Disturbance from vessels (C, O, D)	The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.	**No**
		Distributional responses (O)	The migratory waterbirds from this SPA will not utilise habitat in the marine	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			environment for foraging and therefore will be unaffected by distributional responses.	
		Changes in prey availability and behaviour (C, O, D)	The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore LSE can be excluded.	**No**
		Collision risk (O)	The MSS strategic assessment report[155] concluded that at a strategic level, the populations of non-seabird species which pass through Scottish waters do not appear to be at risk of significant levels of additional mortality due to collisions with Scottish offshore windfarms. It is however evident the number of offshore wind projects and therefore the number of WTGs has increased notably since the publication of the MSS report, A update to the collision risk for migrating birds in Scottish waters was completed by the British Trust for Ornithology in 2023[164.] A CRM specifically for migratory birds is not currently available and Woodward *et al*. [164] outline the scope of a stochastic tool that will be part of a subsequent work package. The Cenos Array Area is considerably offshore, and it is considered likely that	**Yes**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			interactions with migratory birds will be limited. However, considering that Woodward *et al.* [164] outlines that there is, to some degree, potential connectivity with migratory Slavonian grebe, LSE cannot be excluded.	
Inner Moray Firth	Greylag goose Red-breasted merganser Redshank Bar-tailed godwit	Disturbance from vessels (C, O, D)	The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.	**No**
		Distributional responses (O)	The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by distributional responses.	**No**
		Changes in prey availability and behaviour (C, O, D)	The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore LSE can be excluded.	**No**
		Collision risk (O)	The MSS strategic assessment report[155] concluded that at a strategic level, the populations of non-seabird species which pass through Scottish waters do not appear to be at risk of significant levels of additional mortality due to collisions with Scottish offshore windfarms.	**Yes**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			It is however evident the number of offshore wind projects and therefore the number of WTGs has increased notably since the publication of the MSS report, A update to the collision risk for migrating birds in Scottish waters was completed by the British Trust for Ornithology in 2023[164.] A CRM specifically for migratory birds is not currently available and Woodward *et al*. [164] outline the scope of a stochastic tool that will be part of a subsequent work package. The Cenos Array Area is considerably offshore, and it is considered likely that interactions with migratory birds will be limited. However, considering that Woodward *et al.* [164] outlines that that there is, to some degree, potential connectivity with all species from this SPA (greylag goose excepted), LSE cannot be excluded.	
Loch Eye	Whooper swan Greylag goose	Disturbance from vessels (C, O, D)	The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.	**No**
		Distributional responses (O)	The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore	**No**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			will be unaffected by distributional responses.	
		Changes in prey availability and behaviour (C, O, D)	The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore LSE can be excluded.	**No**
		Collision risk (O)	The MSS strategic assessment report[155] concluded that at a strategic level, the populations of non-seabird species which pass through Scottish waters do not appear to be at risk of significant levels of additional mortality due to collisions with Scottish offshore windfarms. It is however evident the number of offshore wind projects and therefore the number of WTGs has increased notably since the publication of the MSS report, A update to the collision risk for migrating birds in Scottish waters was completed by the British Trust for Ornithology in 2023[164.] A CRM specifically for migratory birds is not currently available and Woodward *et al*. [164] outline the scope of a stochastic tool that will be part of a subsequent work package. The Array Area is considerably offshore, located approximately 185 km offshore east of Aberdeen, and it is considered	**Yes**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			likely that interactions with migratory birds will be limited. However, considering that Woodward et al. [131] outlines that there is, to some degree, potential connectivity with migratory whooper swan, LSE cannot be excluded. There is considered to be no connectivity with greylag goose migratory routes and LSE is excluded.	
Cromarty Firth	Whooper swan Bar-tailed godwit Greylag goose Redshank Curlew Red-breasted merganser Scaup Pintail Wigeon Dunlin Oystercatcher	Disturbance from vessels (C, O, D)	The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.	**No**
		Distributional responses (O)	The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by distributional responses.	**No**
		Changes in prey availability and behaviour (C, O, D)	The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore LSE can be excluded.	**No**
		Collision risk (O)	The MSS strategic assessment report[155] concluded that at a strategic level, the populations of non-seabird species which pass through Scottish waters do not appear to be at risk of significant levels of additional mortality due to	**Yes**

Designated site	Features screened in	Potential effect pathway	Consideration of potential LSE	Potential for LSE
			collisions with Scottish offshore windfarms. It is however evident the number of offshore wind projects and therefore the number of WTGs has increased notably since the publication of the MSS report, A update to the collision risk for migrating birds in Scottish waters was completed by the British Trust for Ornithology in 2023[164.] A CRM specifically for migratory birds is not currently available and Woodward *et al*. [164] outline the scope of a stochastic tool that will be part of a subsequent work package. The Array Area is considerably offshore, and it is considered likely that interactions with migratory birds will be limited. However, considering that Woodward *et al.* [164] outlines that there is, to some degree, potential connectivity with all species from this SPA (greylag goose excepted), LSE cannot be excluded.	

9. IN-COMBINATION ASSESSMENT

9.1 In-combination Screening Overview

9.1.1.1 The Habitats Regulations include a requirement for the Competent Authority to consider the need for AA either alone or in-combination with other plans or projects, where these are not directly connected with or necessary to the management of the site. Screening methodology for the Project 'alone' is considered in **Chapter 3: Screening Methodology**. The intention of screening in-combination is to determine, for the plans and projects relevant to each receptor group, which of the designated sites screened in for determination of potential LSE alone may be affected by a spatial and temporal overlap of effect from a relevant plan or project.

9.1.1.2 At this stage in the Screening process, projects or plans must consider the potential for LSE on European sites alone and in-combination with other projects or plans, under the Habitats Regulations. Where it is considered that there is LSE for the Project alone, the application will also consider the potential for the Project to contribute to adverse effects in-combination with other plans or projects.

9.1.1.3 However, given the highly precautionary method for site selection applied during the LSE screening, it is considered that the consolidation of information regarding external plans or projects would not likely result in additional European sites or new effect pathways being identified for the LSE screening. This has been considered in the matrices for each site in **Appendix B** where appropriate.

9.1.1.4 The following sections of the document introduce the methodology for the in-combination assessment for the AA stage.

9.1.1.5 The in-combination assessment will be presented in the RIAA submitted alongside the EIAR. This section details the methodology to establish the list of 'other projects and plans' that will be considered in the AA.

9.1.1.6 This Screening Report has identified broad categories of projects and plans to be considered within the RIAA. Screening of the potential for in-combination LSE is receptor specific, and so the identification of projects that could contribute to an in-combination LSE will be different across receptors. Consideration will also be given for the potential for LSE in-combination, immaterial of whether a potential LSE alone applies or not.

9.1.1.7 The approach that will be taken for the assessment of in-combination impacts will be informed by the Cumulative Effects Assessment that will be carried out for the relevant topics in the Offshore EIAR, this is summarised below.

9.2 Stage 1 – Offshore Zone of Influence Development and 'Long List' Identification

9.2.1 Approach to the 'Long List'

9.2.1.1 The first stage of the in-combination assessment is to produce a 'long list' of other relevant projects, plans and activities ('other developments') happening within a large Study Area around the Project site.

9.2.1.2 The long list includes those in the UK and adjoining international jurisdictions and is based on publicly available information available at the time of preparation. It considers the scale of the other developments, and the potential for these to produce in-combination effects with the Project.

9.2.1.3 The search area extents shown in **Table 9-1** below are defined based on screening ranges considered to be the maximum extents of potential impacts from those activities and are therefore considered to be highly precautionary. Impact-specific screening ranges and Zones of Influence to be developed for individual topics may use reduced ranges depending on topic-specific criteria.

Table 9-1: Long list search area extents

Offshore elements	Search area extent	Rationale
Aggregate, dredging and disposal	≤50 km	This range represents a precautionary maximum distance at which effects from aggregate dredging and disposal could occur (e.g. changes to hydrodynamic regime/coastal processes).
Cables and pipelines	≤50 km	This range represents a precautionary distance at which effects from cables and pipelines (e.g. increases to SSCs from installation could occur).
Commercial fisheries	≤200 km	This range represents a precautionary maximum distance at which effects from commercial fisheries could occur and is wide enough to cover fishing grounds off the East Coast of Scotland and off North East England.
Port and harbour development	≤200 km	This range represents a precautionary maximum distance at which effects from Port and Harbour Development could occur (Numerous receptor types for this so the search area is wide enough to cover noise impacts to marine mammals, socio-economic impacts, shipping and navigation impacts etc).
Military, aviation and radar	≤200 km	This range represents a precautionary maximum distance at which effects from Military and Civil Aviation could occur (e.g. impacts to other helicopter and platform operators, impacts on civil aviation radar).
Offshore energy	≤510 km	This range represents a precautionary maximum distance at which effects from offshore energy (e.g. collision risk to bird species with large foraging ranges) could occur.
Oil and gas	≤500 km	This range represents a precautionary maximum distance at which effects from oil and gas activities (e.g. underwater noise from piling) could occur.
Shipping	≤200 km	This range represents a precautionary maximum distance at which effects from shipping could occur. This range

Offshore elements	Search area extent	Rationale
		comfortably allows for a UK Chamber of Shipping routing Study Area of 50 NM for impacts from the Project with a 50 NM buffer for impacts from other projects.
Carbon capture and storage (CCS)	≤500 km	This range represents a precautionary maximum distance at which effects from CCS could occur (e.g. increases to noise caused by any piling activities). This distance will be considerably reduced if existing wells and platforms are used.

9.2.1.4 All other developments located within the search area will be identified through a desktop study using the following data sources:

- The MD-LOT website including applications and the scoping stage[171];
- The Crown Estate Scotland website[172];
- The Crown Estate website[173];
- European Marine Observation and Data Network (EMODnet) data[52];
- North Sea Transition Authority[174];
- The Marine Management Organisation website[175]; and
- Developers and project proponents' websites where available.

9.2.2 Tiered Approach

9.2.2.1 The tiering structure presented below is in common with that used for the EIA and the screening and assessment of other plans or projects (see **Table 9-2**). The Tiers are listed in descending order of level of detail likely to be available (and certainty of effects arising) for instance, their position in the consenting phase. Appropriate weight may therefore be given to each scenario (Tier) in the decision-making process when considering the potential in combination and cumulative impacts associated with the Project. For example, it may be considered that greater weight be attributed to Tier 1 than Tier 2, where the application for consent is submitted as a minimum therefore more detail will be in the public domain for which a more robust assessment will be able to be carried out.

Table 9-2: Tier structure

Tier	Criteria
Tier 1*	Other plans or projects proposed/consented, but not yet built or operational.
Tier 2	Other plans or projects where a Scoping Report has been submitted.
Tier 3	Other plans or projects where a Scoping Report has not been submitted. Projects likely to come forward where an Agreement for Lease (AfL) has been granted.

*Developments already built and operational at the time of assessment are excluded from in combination assessment, as they are included within the environmental baseline. The exception to this is where projects have an ongoing impact (for example, ongoing operations and maintenance activities).

9.2.2.2 In assessing the potential for in-combination effects from the Project, it is important to bear in mind that other plans or projects, predominantly those 'proposed', may or may not be taken forward for development. Therefore, there is a need to build in a consideration of uncertainty with respect to the potential impacts which might arise from such proposals. For example, other developments which are already under construction have a higher degree of certainty that will contribute to in-combination effects than those other development applications that are at an early stage.

9.2.2.3 For these reasons, all of the relevant plans or projects on the long list will be allocated into 'Tiers' which reflect their current status within the planning and development process. This allows the in-combination assessment to present several scenarios, reflecting the varying levels of uncertainty of an activity proceeding and therefore contributing to in-combination impacts with the Project. The long list will also provide detailed timelines in order to inform assessment.

9.3 Stage 2 – Screening of Offshore 'Long List'

9.3.1 Screening of Offshore 'Long List' - Interactions

9.3.1.1 Following creation of the long list, all other developments will be screened based on the potential for interaction with the Project and on the level of detail available (tiered approach). This screening will produce topic-specific short-lists of other developments which will be considered further within the RIAA.

9.3.1.2 The following criteria will be applied to the screening of the long list for other developments offshore:

9.3.1.3 Screened into the in-combination assessment.

- Where there is a potential for an in-combination effect to occur (based upon available information and professional judgement); and
- All other relevant plans or projects that are publicly available four months prior to the submission of the Project's application.

9.3.1.4 Screened out of the in-combination assessment:

- Other plans or projects which are considered as part of the topic baseline environment;
- Where it is not possible to conduct a meaningful assessment of potential in-combination effects due to insufficient publicly available information;
- Where no potential impact-receptor pathway exists (see **Table 9-3**);
- Where there is no potential for a spatial effect interaction (see **Table 9-3)**; and
- Where there is no potential for a temporal effect interaction (see **Table 9-3**).

9.3.1.5 These criteria ensure a clear justification for screening other developments in or out. Further detail on the other development screening criteria is given in **Table 9-3**.

Table 9-3: Screening criteria

Term	Criteria
Potential impact-receptor pathway (to relevant designated site)	There is the potential that a pathway exists whereby an impact could have an effect on a receptor. For example, increases in suspended

Term	Criteria
	sediment concentration could have an impact on fish and shellfish receptors and increases in underwater noise could have an impact on marine mammal receptors.
Spatial effect interaction	Any potential impacts on a receptor from the Project and one or more other plans/projects have a geographical overlap. For example, underwater noise contours from pin piling at the Projects Array Area could overlap with those of another offshore windfarm project, if it is sufficiently close to the Project. If there is no spatial interaction, there is no potential for an in-combination effect.
Temporal effect interaction	Any potential impacts from the Project and one or more other plans or projects have the potential to occur at the same time. If there is no temporal interaction, there is no potential for an in-combination effect.

9.3.1.6 Only where there is the potential for both spatial and temporal interaction between effects arising from the Project and from one or more of the other developments identified, will an in-combination impact be taken forward for consideration.

9.3.2 Topic Specific Screening List – Impact Ranges

9.3.2.1 The screened long list identifies all the other developments that might give rise to in-combination effects when considered alongside the potential impacts arising from the Project but does not detail the differences in impact ranges for different environmental receptors.

9.3.2.2 The screened long list will be subject to further aspect specific screening to identify those relevant other developments within the ZoIs of the Project for each topic and impact ranges will be defined.

9.4 Stage 3 – Collation of 'Short List'

9.4.1.1 All available information on the 'other developments' within the short list generated at Stage 2 will be collated to inform the in-combination assessment.

9.5 Stage 4 – Assessment of In-combination Effects

9.5.1.1 As part of each topics assessment, a review will be undertaken of each of the 'other developments' in turn to assess whether in-combination effects may arise. This also includes, where relevant, any environmental measures where adverse in-combination effects have been identified and clearly signposts to the relevant means by which required mitigation will be secured.

9.5.1.2 To identify potential environmental mitigation measures that may be required for the Project, due to in-combination effects, the Project will consider the mitigation measures likely to be implemented at the other developments. The Project will use professional judgement to ascertain the contribution of each development to the effect.

10. SUMMARY – OUTCOME OF SCREENING

10.1.1.1 This HRA Screening Report has provided a summary of the LSE screening phase undertaken for the Project, and further summarised in the Screening Matrices in **Appendix B**. This Report has highlighted a suite of European sites that are to be taken forward to Stage 2 of HRA. These are summarised in **Table 10-1**.

10.1.1.2 No LSEs were identified for European sites relevant to benthic ecology. A single site (Moray Firth SAC) relating to marine mammals has been screened in.

10.1.1.3 In respect to ornithology, 23 SPAs with breeding seabirds identified at the site selection phase are screened in. A total of 21 SPAs that support migratory waterbirds are also screened in.

10.1.1.4 Those sites for which an LSE cannot be screened out will now be taken forward for further consideration in the RIAA. This will assess the potential of AEoI either of the Project alone or in combination with other plans or projects.

Table 10-1: European sites for which LSE cannot be excluded

Designated site	Qualifying feature	Project stage	Potential pathways for LSE
European sites designated for marine mammals			
Moray Firth SAC	Bottlenose dolphin	Construction, operation and maintenance, decommissioning	Increase in underwater noise
		Construction, operation and maintenance, decommissioning	Vessel disturbance
European sites designated for bird species			
Buchan Ness to Collieston Coast SPA	Kittiwake	Operation and maintenance	Distributional responses
		Operation and maintenance	Collision risk
	Guillemot	Construction, operation and maintenance, decommissioning	Disturbance from vessels
		Operation and maintenance	Distributional responses
	Shag	Construction, operation and maintenance, decommissioning	Disturbance from vessels
		Construction, operation and maintenance, decommissioning	Changes in prey availability
Fowlsheugh SPA	Kittiwake	Operation and maintenance	Distributional responses
		Operation and maintenance	Collision risk
	Guillemot	Construction, operation and maintenance, decommissioning	Disturbance from vessels
		Operation and maintenance	Distributional responses
	Razorbill	Construction, operation and maintenance, decommissioning	Disturbance from vessels
		Operation and maintenance	Distributional responses
Troup, Pennan and Lion’s Head	Kittiwake	Operation and maintenance	Distributional responses
		Operation and maintenance	Collision risk
	Guillemot	Construction, operation and maintenance, decommissioning.	Disturbance from vessels

Designated site	Qualifying feature	Project stage	Potential pathways for LSE
		Operation and maintenance	Distributional responses
Farne Islands SPA	Puffin	Construction, operation and maintenance, decommissioning	Disturbance from vessels
		Operation and maintenance	Distributional responses
Forth Islands SPA	Kittiwake	Operation and maintenance	Distributional responses
		Operation and maintenance	Collision risk
	Razorbill	Construction, operation and maintenance, decommissioning	Disturbance from vessels
		Operation and maintenance	Distributional responses
	Puffin	Construction, operation and maintenance, decommissioning	Disturbance from vessels
		Operation and maintenance	Distributional responses
	Gannet	Operation and maintenance	Distributional responses
		Operation and maintenance	Collision risk
East Caithness Cliffs SPA	Kittiwake	Operation and maintenance	Distributional responses
		Operation and maintenance	Collision risk
	Razorbill	Construction, operation and maintenance, decommissioning	Disturbance from vessels
		Operation and maintenance	Distributional responses
	Guillemot	Construction, operation and maintenance, decommissioning	Disturbance from vessels
		Operation and maintenance	Distributional responses
Copinsay SPA	Kittiwake	Operation and maintenance	Distributional responses
		Operation and maintenance	Collision risk
North Caithness Cliffs SPA	Kittiwake	Operation and maintenance	Distributional responses
		Operation and maintenance	Collision risk
	Razorbill	Operation and maintenance	Distributional responses
	Puffin	Construction, operation and maintenance, decommissioning	Disturbance from vessels

Designated site	Qualifying feature	Project stage	Potential pathways for LSE
		Operation and maintenance	Distributional responses
Fair Isle SPA	Kittiwake	Operation and maintenance	Distributional responses
		Operation and maintenance	Collision risk
	Puffin	Construction, operation and maintenance, decommissioning	Disturbance from vessels
		Operation and maintenance	Distributional responses
	Gannet	Operation and maintenance	Distributional responses
		Operation and maintenance	Collision risk
Hoy SPA	Kittiwake	Operation and maintenance	Distributional responses
		Operation and maintenance	Collision risk
	Razorbill	Operation and maintenance	Distributional responses
	Puffin	Construction, operation and maintenance, decommissioning	Disturbance from vessels
		Operation and maintenance	Distributional responses
Calf of Eday SPA	Kittiwake	Operation and maintenance	Distributional responses
		Operation and maintenance	Collision risk
Sumburgh Head SPA	Kittiwake	Operation and maintenance	Distributional responses
		Operation and maintenance	Collision risk
Rousay SPA	Kittiwake	Operation and maintenance	Distributional responses
		Operation and maintenance	Collision risk
West Westray SPA	Kittiwake	Operation and maintenance	Distributional responses
		Operation and maintenance	Collision risk
Marwick Head SPA	Kittiwake	Operation and maintenance	Distributional responses
		Operation and maintenance	Collision risk
Foula SPA	Kittiwake	Operation and maintenance	Distributional responses
		Operation and maintenance	Collision risk
	Razorbill	Operation and maintenance	Distributional responses
	Puffin	Operation and maintenance	Distributional responses
Cape Wrath SPA	Kittiwake	Operation and maintenance	Distributional responses

Designated site	Qualifying feature	Project stage	Potential pathways for LSE
		Operation and maintenance	Collision risk
	Puffin	Construction, operation and maintenance, decommissioning	Disturbance from vessels
		Operation and maintenance	Distributional responses
North Rona and Sula Sgeir SPA	Kittiwake	Operation and maintenance	Distributional responses
		Operation and maintenance	Collision risk
	Gannet	Operation and maintenance	Distributional responses
		Operation and maintenance	Collision risk
Handa	Kittiwake	Operation and maintenance	Distributional responses
		Operation and maintenance	Collision risk
Hermaness, Saxa Vord and Valla Field SPA	Kittiwake	Operation and maintenance	Distributional responses
		Operation and maintenance	Collision risk
	Gannet	Operation and maintenance	Distributional responses
		Operation and maintenance	Collision risk
	Puffin	Operation and maintenance	Distributional responses
Shiant Isles SPA	Kittiwake	Operation and maintenance	Distributional responses
		Operation and maintenance	Collision risk
Noss SPA	Kittiwake	Operation and maintenance	Distributional responses
		Operation and maintenance	Collision risk
	Gannet	Operation and maintenance	Distributional responses
		Operation and maintenance	Collision risk
St. Kilda SPA	Gannet	Operation and maintenance	Distributional responses
		Operation and maintenance	Collision risk
Loch of Strathbeg SPA	Barnacle goose Pink-footed goose Whooper swan Goldeneye Teal	Operation and maintenance	Collision risk

Designated site	Qualifying feature	Project stage	Potential pathways for LSE
Ythan Estuary, Sands of Forvie and Meikle Loch SPA	Pink-footed goose Eider Redshank Lapwing	Operation and maintenance	Collision risk
Loch of Skene SPA	Goldeneye Goosander	Operation and maintenance	Collision risk
Cameron Reservoir SPA	Pink-footed goose	Operation and maintenance	Collision risk
Montrose Basin SPA	Pink-footed goose Redshank Oystercatcher Eider Wigeon Knot Dunlin Shelduck	Operation and maintenance	Collision risk
Moray Firth SPA	Great northern diver Red-throated diver Slavonian grebe Scaup Eider Long-tailed duck Common scoter Velvet scoter Goldeneye Red-breasted merganser Shag	Operation and maintenance	Collision risk
Firth of Tay and Eden Estuary SPA	Bar-tailed godwit Redshank Pink-footed goose Velvet scoter	Operation and maintenance	Collision risk

Designated site	Qualifying feature	Project stage	Potential pathways for LSE
	Shelduck Eider Common scoter Black-tailed godwit Goldeneye Red-breasted merganser Goosander Oystercatcher Grey plover Sanderling Dunlin Long-tailed duck		
Firth of Forth SPA	Red-throated diver Slavonian grebe Golden plover Bar-tailed godwit Pink-footed goose Shelduck Knot Redshank Turnstone Scaup Great crested grebe Curlew Eider Long-tailed duck Common scoter Velvet scoter Goldeneye Red-breasted merganser	Operation and maintenance	Collision risk

Designated site	Qualifying feature	Project stage	Potential pathways for LSE
	Oystercatcher Ringed plover Grey plover Dunlin Mallard Lapwing Wigeon		
Moray and Nairn Coast SPA	Bar-tailed godwit Pink-footed goose Redshank Red-breasted merganser Dunlin Oystercatcher Wigeon	Operation and maintenance	Collision risk
Loch of Kinnordy SPA	Pink-footed goose	Operation and maintenance	Collision risk
Greenlaw Moor SPA	Pink-footed goose	Operation and maintenance	Collision risk
Din Moss – Hoselaw Loch SPA	Pink-footed goose	Operation and maintenance	Collision risk
Caithness Lochs SPA	Whooper swan	Operation and maintenance	Collision risk
Loch Leven SPA	Whooper swan Pink-footed goose Shoveler Gadwall Teal Pochard Tufted duck Goldeneye	Operation and maintenance	Collision risk
South Tayside Goose Roosts SPA	Wigeon Pink-footed goose	Operation and maintenance	Collision risk
Dornoch Firth and Loch Fleet SPA	Bar-tailed godwit	Operation and maintenance	Collision risk

Designated site	Qualifying feature	Project stage	Potential pathways for LSE
	Wigeon Curlew Teal Scaup Redshank Dunlin Oystercatcher		
East Sanday Coast SPA	Bar-tailed godwit Purple sandpiper Turnstone	Operation and maintenance	Collision risk
Loch Ashie SPA	Slavonian Grebe	Operation and maintenance	Collision risk
Inner Moray Firth SPA	Red-breasted merganser Redshank Bar-tailed godwit	Operation and maintenance	Collision risk
Loch Eye SPA	Whooper swan	Operation and maintenance	Collision risk
Cromarty Firth SPA	Whooper swan Bar-tailed godwit Redshank Curlew Red-breasted merganser Scaup Pintail Wigeon Dunlin Oystercatcher	Operation and maintenance	Collision risk

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HRA Appendix A

List of Designated Sites Identified through Site Selection

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1	First Draft Appendix A	08/05/24
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Contents

1. APPENDIX A LIST OF DESIGNATED SITES IDENTIFIED THROUGH SITE SELECTION

Designated site	Information source
Annex I Benthic Habitats	
Buchan Ness to Colliestan SAC	https://sitelink.nature.scot/site/8214
Annex II Marine Mammals	
Baie de Canche et couloir des trois estuaires SAC	http://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=FR3 102005
Baie de Seine occidentale SAC	http://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=FR2 502020
Baie de Seine orientale SAC	http://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=FR2
Bancs des Flandres SAC	http://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=FR3102002
Berwickshire and North Northumberland Coast SAC	https://designatedsites.naturalengland.org.uk/Marine/MarineSiteDetail.aspx?SiteCode=UK0017072&SiteName=berwickshire&SiteNameDisplay=Berwickshire%20and%20North%20Northumberland%20Coast%20SAC&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=&NumMarineSeasonality=1&HasCA=1
Borkum-Riffgrund SCI	http://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=DE2104301
Doggerbank SCI	http://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=DE1003301
Doggersbank SAC (dutch)	https://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=DE1209301
Duinen Goeree & Kwade Hoek SAC	https://www.natura2000.nl/gebieden/zuid-holland/duinen-goeree-kwade-hoek/duinen-goeree-kwade-hoek-aanwijzing
Falaises du Cran aux Oeufs et du Cap Gris-Nez, Dunes du Chatelet, Marais de Tardinghen et Dunes de Wissant SAC	http://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=FR3100478
Grevelingen SAC	https://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=NL4000021
Gule Rev SAC	http://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=DK00VA259
Hamburgisches Wattenmeer SAC	http://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=DE2016301
Helgoland mit Helgolander Felssockel SAC	http://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=DE1813391
Klaverbank SAC	http://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=NL2008002
Kosterfjorden-Väderöfjorden SAC	http://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=SE0520170

Designated site	Information source
Moray Firth SAC	http://gateway.snh.gov.uk/sitelink/siteinfo.jsp?pa_code=8327
Nationalpark Niedersachsisches Wattenmeer SAC	http://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=DE2306301
Noordzeekustzone SAC	http://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=NL9802001
NTP S-H Wattenmeer und angrenzende Kustengebiete SAC	http://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=DE0916391
Oosterschelde	http://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=NL3 009016
Recifs Gris-Nez Blanc-Nez SAC	http://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=FR3102003
Ridens et dunes hydrauliques du detroit du Pas-de-Calais SAC	http://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=FR3102004
Skagens Gren og Skagerrak SAC	http://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=DK00FX112
Southern North Sea SAC	https://jncc.gov.uk/our-work/southern-north-sea-mpa/
SPA Ostliche Deutsche Bucht	http://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=DE1011401
Steingrund SAC	http://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=DE1714391
Store Rev SAC	http://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=DK00VA258
Sydlige Nordsø SAC	http://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=DK00VA347
Sylter Außenriff SCI	http://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=DE1209301
Unterelbe SAC	https://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=DE2018331
Vadehavet med Ribe Å, Tved Å og Varde Å vest for Varde SAC	http://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=DK00AY176
Vlaamse Banken SAC	http://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=BEMNZ0001
Vlakte van de Raan SAC	https://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=NL2008003
Vlakte van de Raan SCI	http://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=BEMNZ005
Voordelta	http://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=NL4 000017
Waddenzee SAC	http://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=NL1000001
Westerschelde & Saeftinghe SAC	http://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=NL9803061
Offshore Ornithology	
Ailsa Craig SPA	https://sitelink.nature.scot/site/8463
Auskerry SPA	https://sitelink.nature.scot/site/8466
Buchan Ness to Collieston Coast SPA	https://sitelink.nature.scot/site/8473

Designated site	Information source
Caithness Lochs Ramsar	https://sitelink.nature.scot/site/8413
Caithness Lochs SPA	https://sitelink.nature.scot/site/8477
Calf of Eday SPA	https://sitelink.nature.scot/site/8478
Cameron Reservoir Ramsar	https://sitelink.nature.scot/site/8414
Cameron Reservoir SPA	https://sitelink.nature.scot/site/8479
Cape Wrath SPA	https://sitelink.nature.scot/site/8481
Copinsay SPA	https://sitelink.nature.scot/site/8485
Cromarty Firth SPA	https://sitelink.nature.scot/site/8488
Din Moss- Hoselaw Loch Ramsar	https://sitelink.nature.scot/site/8419
Din Moss- Hoselaw Loch SPA	https://sitelink.nature.scot/site/8489
Dornoch Firth and Loch Fleet Ramsar	https://sitelink.nature.scot/site/8420
Dornoch Firth and Loch Fleet SPA	https://sitelink.nature.scot/site/8490
East Caithness Cliffs SPA	https://sitelink.nature.scot/site/8492
East Sanday Coast Ramsar	https://sitelink.nature.scot/site/8421
East Sanday Coast SPA	https://sitelink.nature.scot/site/8493
Fair Isle SPA	https://sitelink.nature.scot/site/8496
Farne Islands SPA	https://designatedsites.naturalengland.org.uk/SiteGeneralDetail.aspx?SiteCode=UK9006021&SiteName=farne&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=
Fetlar SPA	https://sitelink.nature.scot/site/8498
Firth of Forth Ramsar	https://sitelink.nature.scot/site/8424
Firth of Forth SPA	https://sitelink.nature.scot/site/8499
Firth of Tay and Eden Estuary Ramsar	https://sitelink.nature.scot/site/8425
Firth of Tay and Eden Estuary SPA	https://sitelink.nature.scot/site/8501
Flamborough & Filey Coast SPA	https://designatedsites.naturalengland.org.uk/SiteGeneralDetail.aspx?SiteCode=UK9006101&SiteName=flamborough&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=
Flannan Isles	https://sitelink.nature.scot/site/8502
Forth Islands SPA	https://sitelink.nature.scot/site/8500
Foula SPA	https://sitelink.nature.scot/site/8504
Fowlsheugh SPA	https://sitelink.nature.scot/site/8505
Greenlaw Moor Ramsar	https://sitelink.nature.scot/site/8427
Greenlaw Moor SPA	https://sitelink.nature.scot/site/8509
Handa SPA	https://sitelink.nature.scot/site/8511
Hermaness, Saxa Vord and Valla Field SPA	https://sitelink.nature.scot/site/8512
Hoy SPA	https://sitelink.nature.scot/site/8513
Inner Moray Firth	https://sitelink.nature.scot/site/8515
Loch Ashie SPA	https://sitelink.nature.scot/site/8525
Loch Eye Ramsar	https://sitelink.nature.scot/site/8434
Loch Eye SPA	https://sitelink.nature.scot/site/8526
Loch Leven Ramsar	https://sitelink.nature.scot/site/8436
Loch Leven SPA	https://sitelink.nature.scot/site/8530

Designated site	Information source
Loch of Kinnordy Ramsar	https://sitelink.nature.scot/site/8440
Loch of Kinnordy SPA	https://sitelink.nature.scot/site/8534
Loch of Skene Ramsar	https://sitelink.nature.scot/site/8442
Loch of Skene SPA	https://sitelink.nature.scot/site/8536
Loch of Strathbeg Ramsar	https://sitelink.nature.scot/site/8443
Loch of Strathbeg SPA	https://sitelink.nature.scot/site/8537
Loch Spynie Ramsar	https://sitelink.nature.scot/site/8445
Loch Spynie SPA	https://sitelink.nature.scot/site/8540
Marwick Head SPA	https://sitelink.nature.scot/site/8544
Mingulay and Berneray SPA	https://sitelink.nature.scot/site/8545
Montrose Basin Ramsar	https://sitelink.nature.scot/site/8446
Montrose Basin SPA	https://sitelink.nature.scot/site/8548
Moray and Nairn Coast Ramsar	https://sitelink.nature.scot/site/8447
Moray and Nairn Coast SPA	https://sitelink.nature.scot/site/8550
Moray Firth SPA	https://sitelink.nature.scot/site/10490
North Caithness Cliffs SPA	https://sitelink.nature.scot/site/8554
North Rona and Sula Sgeir SPA	https://sitelink.nature.scot/site/8558
Noss SPA	https://sitelink.nature.scot/site/8561
Ronas Hill – North Roe and Tingon SPA	https://sitelink.nature.scot/site/8572
Rousay SPA	https://sitelink.nature.scot/site/8573
Shiant Isles SPA	https://sitelink.nature.scot/site/8575
South Tayside Goose Roosts Ramsar	https://sitelink.nature.scot/site/8456
South Tayside Goose Roosts SPA	https://sitelink.nature.scot/site/8577
St. Abb's Head to Fast Castle SPA	https://sitelink.nature.scot/site/8579
St. Kilda SPA	https://sitelink.nature.scot/site/8580
Sule Skerry and Sule Stack SPA	https://sitelink.nature.scot/site/8581
Sumburgh Head SPA	https://sitelink.nature.scot/site/8582
Troup, Pennan and Lion's Head SPA	https://sitelink.nature.scot/site/8587
West Westray SPA	https://sitelink.nature.scot/site/8589
Ythan Estuary and Meikle Loch Ramsar	https://sitelink.nature.scot/site/8460
Ythan Estuary, Sands of Forvie and Meikle Loch SPA	https://sitelink.nature.scot/site/8592

HRA Appendix B
Matrices

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Contents

Appendix B Matrices

The following matrix key is applicable to the matrices presented in this appendix:

✓ = Potential for a Likely Significant Effect (LSE);

X = No potential for a LSE;

C = Construction phase;

OM = Operation and Maintenance phase; and

D = Decommissioning phase.

a, b, c, d…. etc. = Reference to the related footnote for each matrix respectively.

1. BENTHIC HABITAT MATRICES

1.1 Buchan Ness to Collieston SAC

Table 1-1: LSE Matrix for benthic habitat features of Buchan Ness to Collieston SAC

Distance from Project					0 km from ECC; 186 km from Array Area							
Feature	Physical disturbance and temporary loss of habitat			Physical disturbance and long-term loss of habitat			Accidental pollution			In-combination effects		
	C	OM	D	C	OM	D	C	OM	D	C	OM	D
Vegetated sea cliffs	Xa	Xa	Xa	Xa	Xa	Xa	Xa	Xa	Xa	Xb	Xb	Xb

a Physical disturbance and temporary/long-term loss of habitat, heat, EMF and accidental pollution

The Buchan Ness to Collieston Special Area of Conservation (SAC) is located within the proposed Export/Import Cable Corridor (ECC); however, the designation relates to a qualifying feature above Mean High Water Springs (MHWS) and no intertidal or subtidal species are included in the feature. As the design for the Project now involves use of horizontal directional drilling (HDD) to route the cables from a point 190 m out to sea to a point 100 – 120 m inland of the cliffs where the qualifying feature is located, there will be no LSE arising from habitat disturbance. Tunnelled cable will eliminate effects of heat and electromagnetic field (EMF). There will be no requirement for machinery to cross the cliff line therefore there will be no LSE as a result of accidental pollution.

b In-combination effects

Given that no effect pathway to LSE exists for the feature of this SAC, the potential for in-combination effects with other plans and projects is not considered.

2. MARINE MAMMALS MATRICES

2.1 Moray Firth SAC

Table 2-1: LSE Matrix for marine mammal features of Moray Firth SAC

Distance from Project																94 km from ECC; 282 km from Array Area								
Feature	**Underwater noise**			**Vessel disturbance**			**Offshore vessels interaction with marine mammals resulting in injury and/or mortality**			**Changes to prey resources**			**Accidental spills to the marine environment**			**Potential changes to suspended sediment concentrations**			**Presence of offshore structures creating a physical barrier effect**			**In-combination effects**		
	C	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**
Bottlenose dolphin	✓a	✓a	✓a	✓b	✓b	✓b	Xc	Xc	Xc	Xd	Xd	Xd	Xe	Xe	Xe	Xf	Xf	Xf		Xg		✓ h	✓ h	✓h

The Moray Firth SAC protects bottlenose dolphin as a qualifying feature and is located approximately 94 km from the ECC and 282 km from the Array Area. Bottlenose dolphins were not observed in the Array Area during the DAS surveys or by Marine Management Organisation (MMO)/Passive Acoustic Monitoring (PAM) undertaken during the geophysical and environmental surveys of the Array Area and ECC (outwith 12 NM). However, the western portion of the ECC (within the 12 NM limits) overlaps with the bottlenose dolphin Coastal East Scotland (CES) Management Unit (MU). NatureScot consider any activity within the bottlenose dolphin CES MU as functionally linked with the Moray Firth SAC; therefore, activities with the potential to impact any individuals within this MU will be considered for LSE on bottlenose dolphins as qualifying features of this protected site.

a Increase in Underwater Noise

Project specific underwater noise modelling has not yet been completed but will be completed in support of the EIA Report (EIAR) and Report to Inform Appropriate Assessment (RIAA). Underwater noise from pre-construction surveys and Unexploded Ordnance (UXO) clearance, as well as during percussive piling of the Offshore Substation Converter Platform (OSCP) and possibly the anchors, within the ECC and Array Area can cause disturbance, injury and in extreme instances, mortality, to bottlenose dolphins. Based on project-specific survey data, the project does not anticipate requirements for extensive UXO clearance within the ECC or Array Area. Moreover, any potential for injury or mortality will be suitably mitigated via best practice guidance for all activities. However, the project will seek to understand the potential for injury and mortality to occur, prior to the application of mitigations, via dedicated noise modelling. Moreover, disturbance related impacts may have disproportionate effects on small, resident populations, such as the bottlenose dolphins associated with the CES MU. Existing Joint Nature Conservation Committee (JNCC) guidance on noise management in harbour porpoise SACs[1] indicates that the effective deterrent radius for disturbance impacts will occur approximately 12 km from the site of seismic airgun arrays, 5 km from sub-bottom profilers, 15 km for pin-piling and 26 km from the location of UXO detonation and monopile installation (without noise abatement). However, due to species-specific differences in auditory sensitivities to noise frequencies, it is anticipated that disturbance related impacts to bottlenose dolphins from any such activities occurring within the ECC and Array Area will vary, and this variation will be identified through dedicated underwater noise modelling and impacts will be characterised on both individual and population levels.

For these reasons, it is considered that there is the potential for LSE on bottlenose dolphins as qualifying features of the Moray Firth SAC based on connectivity via the relevant coastal management unit and its overlap with underwater noise generating activities within the ECC and the Array Area.

b Vessel Disturbance

Vessel activities in the marine environment generate a variety of behavioural responses from marine mammals, from active evasive manoeuvring to bowriding. These differences often reflect individual behaviour at the time of interaction (e.g. travel, resting, foraging, socialising, nursing, etc.), and species or taxa-specific morphological and behavioural differences (i.e. potentially reflected by size and speed and whether positive or negative behavioural responses are more likely).

It is difficult to decouple whether disturbance is caused by the physical presence of the vessels, the underwater noise generated by them, or a combination of the two. Vessel-related disturbance to marine mammals is fairly spatially constrained, relative to the home ranges or migratory distances covered by the majority of species. Indeed, the physical presence of the vessel should only generate a response over distances within which the vessel could be sensed, such as visually or echolocation signal return distances. Underwater noise from vessels is expected to generate disturbance impacts over a greater distance than would be generated by physical presence, due to the propagation of low frequency sound in the marine environment. To ensure the potential vessel-related disturbance effects are fully characterised, dedicated noise modelling will be undertaken to support the EIAR and RIAA which considers underwater noise from vessels.

There is potential for bottlenose dolphins to be disturbed or displaced as a result of vessel activity. However, given the distance between the SAC and the Array Area, there is no potential LSE from activities within the Array Area due to the spatially constrained, residential nature of this small population of coastal bottlenose dolphins. The ECC passes through the bottlenose dolphin CES MU. NatureScot considers any activity within the bottlenose dolphin MU as functionally linked. Therefore, potential LSE exists as a result of any activity within the coastal strip.

For these reasons, it is considered that there is the potential for LSE on bottlenose dolphins as qualifying features of the Moray Firth SAC based on connectivity via the relevant coastal management unit and its overlap with vessel activities within the ECC.

c Offshore Vessels Interaction with Marine Mammals Resulting in Injury and/or Mortality

Vessel activities, including transiting to and from site, will be restricted to the boundaries of the Project and along routes to local ports. The risk of an injury-inducing or fatal collision with a marine mammal is influenced by the echolocation of marine mammals and vessels and whether those animals are exposed to vessels on a regular basis[2]. The increase in vessel traffic associated with the various phases of the Project is likely to be low compared to background levels, given the Array Area and ECC occur in regions utilised by various maritime industries (i.e. fishing, oil and gas, shipping, etc.). Indeed, the resident bottlenose dolphins associated with the CES MU encounter a wide variety of industrial and recreational vessels across their range without any records of injury or mortality from vessels.

Avoidance behaviour by cetaceans is often associated with unpredictable boats transiting at higher speeds[3,4,5,6]. Slower vessels following a consistent trajectory allow marine mammals the opportunity to avoid collisions. The probability of collision is estimated to decrease to less than 50 percent when large vessels reduce speeds to 10 knots[7] and fatal collisions are more likely when vessels are transiting at higher speeds[8],[9]. Project vessels will be operating at slow speeds and many will be stationary (holding position) for construction and maintenance works, so the potential for collision is considered very limited. Moreover, any disturbance effects from vessel activities (as detailed above) would further reduce the potential for collision risk to bottlenose dolphins.

The potential for project-related vessel activities to result in injurious or fatal collision which would have a LSE on the bottlenose dolphin population associated with the Moray Firth SAC is considered negligible and is therefore screened out for further consideration for this site.

d Changes to Prey Resources

Bottlenose dolphins are opportunistic generalist predators and known prey species include a wide range of fish and shellfish taxa. Activities along the ECC which include potential to effect fish populations will largely be limited to increases in suspended sediment concentrations (SSC) and mobilisation of contaminants from the installation and removal of the export/import cable during the construction and decommissioning phases of the project. These impacts will be temporary and highly localised in nature and are not likely to impact entire populations of species. As noted in Appendix 5F: Approach to EMF and heat as potential impacts of the 2024 Scoping Report[10] Impacts from EMF and heat generated by the buried cable during the Project's operational phase will be extremely localised in nature, as cable burial and/or protection further insulates against EMF and heat effects, and thus is expected to have a limited impact on the abundance and distribution of fish and shellfish populations. This assertion is supported by the existing evidence base, formed by a variety of transmission and telecommunications cables which are located within the range of the CES MU (e.g. Kincardine, Beatrice, Hywind, Moray East and Aberdeen Offshore Windfarms; TAMPNET; SHEFA), none of which have been identified to adversely effect fish or shellfish populations as prey of bottlenose dolphins associated with this site.

The potential for cable operation, or installation and decommissioning activities, to result in important or lasting impacts to prey resources which would have a LSE on the bottlenose dolphin population associated with the Moray Firth SAC is considered negligible and is therefore screened out for further consideration for this site.

e Accidental Spills to the Marine Environment

There is a risk of pollution being accidentally released from vessels and equipment involved during the construction phase of the Project. Pollution events are considered unlikely, and given the volumes associated with offshore windfarm developments, should an event occur, effects will be temporary, reversible and limited in spatial extent (for example, due to the expected low volumes of pollutants associated with offshore wind developments).

The risk of pollution events will be managed by the implementation of an Environmental Management Plan and Marine Pollution Contingency Plan. These plans will provide planning for accidental spills and address potential contaminant releases. All vessels to be used as part of any phase of the Project will adopt a waste management plan in line with the requirements set out as part of the International Convention for the Prevention of Pollution from Ships (MARPOL[11]) and the Shipboard Oil Pollution Emergency Plan (SOPEP).

The potential for project-related activities to result in an accidental spill which would have a LSE on the bottlenose dolphin population associated with the Moray Firth SAC is considered negligible and is therefore screened out for further consideration for this site.

f Potential Changes to Suspended Sediment Concentrations

Sediment disturbance arising from construction, operations and maintenance, and decommissioning activities (e.g., anchoring and cable installation, and seabed preparation works) may result in temporary increases in SSC which can directly impact the foraging ability of marine mammals. Indirect effects may also occur as a result of impacts to prey species from SSC (these are considered under 'changes to prey availability' above). Bottlenose dolphins are adapted to, and tolerant of, turbid environments[12]. The localised and short-term nature of increases in SSC generated by project activities are unlikely to result in a significant effect on the foraging ability of this species.

The potential for project activities to result changes to SSC which would have a LSE on the bottlenose dolphin population associated with the Moray Firth SAC is considered negligible and is therefore screened out for further consideration for this site.

g Presence of Offshore Structures Creating a Physical Barrier Effect

The location of the Array Area, and the offshore structures therein, is far outwith the CES MU (greater than 100 km). It is considered that there is no potential for connectivity between the physical presence of these structures and the bottlenose dolphins associated with the Moray Firth SAC. As such, the potential for the presence of offshore structures creating a physical barrier effect which would result in a LSE on the Moray Firth SAC is considered negligible and is therefore screened out for further consideration for this site.

h In-combination Effects

Given that at least one effect pathway to LSE exists for the qualifying feature of this SAC, the potential for in-combination effects with other plans and projects remains and will be considered further.

2.2 Berwickshire and North Northumberland Coast SAC

Table 2-2: LSE Matrix for marine mammal features of Berwickshire and North Northumberland Coast SAC

Distance from Project																169 km from ECC; 228 km from Array Area								
Feature	Underwater noise			Vessel disturbance			Offshore vessels interaction with marine mammals resulting in injury and/mortality			Changes to prey resources			Accidental spills to the marine environment			Potential changes to suspended sediment concentrations			Presence of offshore structures creating a physical barrier effect			In-combination effects		
	C	OM	D	C	OM	D	C	OM	D	C	OM	D	C	OM	D	C	OM	D	C	OM	D	C	OM	D
Grey seal	Xa	Xa	Xa	Xb	Xb	Xb	Xc	Xc	Xc	Xd	Xd	Xd	Xe	Xe	Xe	Xf	Xf	Xf		Xg		Xh	Xh	Xh

The Berwickshire and North Northumberland Coast SAC protects grey seal as a qualifying feature and is located approximately 169 km from the ECC and 228 km from the Array Area. Five grey seals were recorded within the proposed Array Area in monthly aerial surveys conducted between 2021 – 2023 and three grey seals were recorded by MMO undertaken during the geophysical and environmental surveys of the Array Area and ECC (outwith 12 NM). Grey seals frequently travel over 100 km from their haul out site to forage, and may travel over 200 km between haul out sites, but remain within much closer proximity to haul outs during vulnerable periods, such as the breeding and moulting seasons[13]. The Berwickshire and North Northumberland Coast SAC offers terrestrial and coastal marine protection to grey seals which predominantly occupy this location during these vulnerable periods. Based on NatureScot's HRA Screening Response to other Scottish Offshore Windfarms (e.g. West of Orkney, Pentland, etc.) the project proposes a Zone of Influence of 20 km from the location of Scottish protected sites with grey seal qualifying features. However, advice received from Natural England, as captured in the Cenos 2023 Scoping Opinion, requested this site was considered further by the Project.

a Increase in Underwater Noise

Project specific underwater noise modelling has not yet been completed but will be completed in support of the EIAR and RIAA. Underwater noise from pre-construction surveys and UXO clearance, as well as during percussive piling of the OSCP and possibly the anchors, can cause disturbance, injury and in extreme instances, mortality, to grey seals. Based on project-specific survey data, the project does not anticipate requirements for extensive UXO clearance. Moreover, any potential for injury or mortality will be suitably mitigated via best practice guidance for all activities. However, the Project will seek to understand the potential for injury and mortality to occur, prior to the application of mitigations, via dedicated noise modelling. Moreover, disturbance related impacts may have disproportionate effects on populations during vulnerable periods.

Existing JNCC guidance on noise management in harbour porpoise SACs[14] indicates that the effective deterrent radius for disturbance impacts will occur approximately 12 km from the site of seismic airgun arrays, 5 km from sub-bottom profilers, 15 km for pin-piling and 26 km from the location of UXO detonation and monopile installation (without noise abatement). However, due to species-specific differences in auditory sensitivities to noise frequencies, it is anticipated that disturbance related impacts to grey seals from any such activities occurring within the ECC and Array Area will be reduced. The distances over which underwater noise would propagate are considered too great to have the potential to impact the population of grey seals protected by the Berwickshire and North Northumberland Coast SAC.

The potential for noise-generating activities to result in a LSE on the grey seal population associated with the Berwickshire and North Northumberland Coast SAC is considered negligible and is therefore screened out for further consideration for this site.

b Vessel Disturbance

Vessel activities in the marine environment generate a variety of behavioural responses from marine mammals, from active evasive manoeuvring to bowriding. These differences often reflect individual behaviour at the time of interaction (e.g. travel, resting, foraging, socialising, nursing, etc.), and species or taxa-specific morphological and behavioural differences (i.e. potentially reflected by size and speed and whether positive or negative behavioural responses are more likely).

It is difficult to decouple whether disturbance is caused by the physical presence of the vessels, the underwater noise generated by them, or a combination of the two. Vessel-related disturbance to marine mammals is fairly spatially constrained, relative to the home ranges or migratory distances covered by the majority of species. Indeed, the physical presence of the vessel should only generate a response over distances within which the vessel could be sensed, such as over visual distance. Underwater noise from vessels is expected to generate disturbance impacts over a greater distance than would be generated by physical presence, due to the propagation of low frequency sound in the marine environment. To ensure the potential vessel-related disturbance effects are fully characterised, dedicated noise modelling will be undertaken to support the EIAR and RIAA which considers underwater noise from vessels.

However, given the distance of vessel activities from the protected site and limited connectivity with its protected features, the potential for vessel-related activities to result in a disturbance-mediated LSE on the grey seal population associated with the Berwickshire and North Northumberland Coast SAC is considered negligible and is therefore screened out for further consideration for this site.

c Offshore Vessels Interaction with Marine Mammals Resulting in Injury and/Mortality

Vessel activities, including transiting to and from site, will be restricted to the boundaries of the Project and along routes to local ports. The risk of an injury-inducing or fatal collision with a marine mammal is influenced by the echolocation of marine mammals and vessels and whether those animals are exposed to vessels on a regular basis[15]. The increase in vessel traffic associated with the various phases of the Project is likely to be low compared to background levels, given the Array Area and ECC occur in regions utilised by various maritime industries (i.e. fishing, oil and gas, shipping, etc.). Indeed, grey seals along the east coast of the United Kingdom (UK) encounter a wide variety of industrial and recreational vessels across their range and many temporarily occupy ports or harbours without issue.

Avoidance behaviour exhibited by other taxa of marine mammals is often associated with unpredictable boats transiting at higher speeds[3,4,5,6]. Slower vessels following a consistent trajectory allow marine mammals the opportunity to avoid collisions. The probability of collision is estimated to decrease to less than 50 percent when large vessels reduce speeds to 10 knots[7] and fatal collisions are more likely when vessels are transiting at higher speeds [8,9]. Project vessels will be operating at slow speeds and many will be stationary (holding position) for construction and maintenance works, so the potential for collision is considered very limited. Moreover, any disturbance effects from vessel activities (as detailed above) would further reduce the potential for collision risk to grey seals.

The potential for project-related vessel activities to result in injurious or fatal collision which would have a LSE on the grey seal population associated with the Berwickshire and North Northumberland Coast SAC is considered negligible and is therefore screened out for further consideration for this site.

d Changes to Prey Resources

Effects on fish populations from underwater noise, SSC, mobilisation of contaminants and habitat disturbance are likely to be temporary, localised and short-term in nature and largely constrained to the installation and decommissioning phases of the project. There is potential that maintenance activities, as well as the movement of the dynamic mooring and cabling infrastructure along the seabed within the Array Area, could disturb the seabed in such a way as to alter habitat use by demersal fish and epibenthic shellfish prey species within this area. However, the footprint of these ‘swept areas’ is very small in comparison to the available habitat which support likely prey species. Given the low numbers of grey seal recorded during site-specific surveys and the distance of the Project offshore, the Array Area is not likely to constitute an important foraging area.

EMF generated by the transmission and generation cabling infrastructure whilst operational will be highly constrained to within meters or tens of meters to the buried and floating cable infrastructure. All cables will be insulated and designed to minimise transmission loss (heat loss). Moreover, burial and/or protection further insulates against EMF and heat effects. Therefore, it is considered that the operational cables have limited potential to impact marine mammal prey availability and distribution which would result in changes to prey resources.

On this basis, the potential for project activities to generate changes in prey abundance or distribution which could confer a LSE on the grey seal population associated with the Berwickshire and North Northumberland Coast SAC is considered negligible and is therefore screened out for further consideration for this site.

e Accidental Spills to the Marine Environment

There is a risk of pollution being accidentally released from vessels and equipment involved during the construction phase of the Project. Pollution events are considered unlikely, and given the volumes associated with offshore windfarm developments, should an event occur, effects will be temporary, reversible and limited in spatial extent (for example, due to the expected low volumes of pollutants associated with offshore wind developments).

The risk of pollution events will be managed by the implementation of an Environmental Management Plan and Marine Pollution Contingency Plan. These plans will provide planning for accidental spills and address potential contaminant releases. All vessels to be used as part of any phase of the Project will adopt a waste management plan in line with the requirements set out as part of the MARPOL[11] and the SOPEP.

The potential for project-related activities to result in an accidental spill which would have a LSE on the grey seal population associated with the Berwickshire and North Northumberland Coast SAC is considered negligible and is therefore screened out for further consideration for this site.

f Potential Changes to Suspended Sediment Concentrations

Sediment disturbance arising from construction, operations and maintenance, and decommissioning activities (e.g. anchoring and cable installation, and seabed preparation works) may result in temporary increases in SSC which can directly impact the foraging ability of marine mammals. Indirect effects may also occur as a result of impacts to prey species from SSC (these are considered under ‘changes to prey availability’). Grey seals frequently occur in turbid environments and are adapted to navigating and locating prey in such conditions[12]. The localised and short-term nature of increases in SSC generated by project activities are unlikely to result in a significant effect on the foraging or reproductive success, or survivorship, in this species.

The potential for project activities to result in changes to SSC which would have a LSE on the grey seal population associated with the Berwickshire and North Northumberland Coast SAC is considered negligible and is therefore screened out for further consideration for this site.

g Presence of Offshore Structures Creating a Physical Barrier Effect

There is currently no evidence to indicate that a floating offshore wind farm site could cause a barrier to movement for grey seals or any other marine mammal species. A literature review conducted for Equinor on floating windfarms and potential barrier effects[21], cited several studies where marine mammals including harbour porpoise and grey seal were observed in the vicinity of operational fixed wind farms[16,17] and foraging around Oil and Gas platforms[18]. The wide spacing of (target of at least 1 km) between turbine structures at the surface and a minimum of 500 m between submarine structures will allow passage of marine mammals through the area unimpeded. There will be a maximum of nine mooring lines per Wind Turbine Generator (WTG) with a mooring radius of approximately 850 m. The footprint of these structures is minimal compared to the available space within the Array Area, moreover, grey seals are several orders of magnitude smaller than the infrastructure in question, allowing individuals to readily travel through the area unaffected.

The potential for the presence of offshore structures to create a physical barrier effect which would have a LSE on the grey seal population associated with the Berwickshire and North Northumberland Coast SAC is considered negligible and is therefore screened out for further consideration for this site.

h In-combination Effects

Given that at least one effect pathway to LSE exists for the qualifying feature of this SAC, the potential for in-combination effects with other plans and projects remains and will be considered further.

2.3 Southern North Sea SAC

Table 2-3: LSE Matrix for marine mammal features of Southern North Sea SAC

Distance from Project																**194 km from ECC; 173 km from Array Area**								
Feature	**Increase in underwater noise**			**Vessel disturbance**			**Offshore vessels interaction with marine mammals resulting in injury and/mortality**			**Changes to prey resources**			**Accidental spills to the marine environment**			**Potential changes to suspended sediment concentrations**			**Presence of offshore structures creating a physical barrier effect**			**In-combination effects**		
	C	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**
Harbour porpoise	Xa	Xa	Xa	Xb	Xb	Xb	Xc	Xc	Xc	Xd	Xd	Xd	Xe	Xe	Xe	Xf	Xf	Xf		Xg		Xh	Xh	Xh

The Southern North Sea SAC protects harbour porpoise as a qualifying feature and is located approximately 194 km from the ECC and 173 km from the Array Area. Harbour porpoise were the most numerous species recorded during the monthly aerial surveys of the Array Area conducted between 2021 – 2023 (152 over the entire survey period); although sightings numbers were considered low relative to other regions of the North Sea. Additionally, two suspected harbour porpoise were recorded by MMOs during the geophysical and environmental surveys of the Array Area and ECC (outwith 12 NM). The Southern North Sea SAC protects the seasonal summer and winter habitats of over 15 percent of the UK's harbour porpoise North Sea MU. Whilst the Project also falls within the North Sea MU, NatureScot's HRA Screening Response to other Scottish Offshore Windfarms (e.g. West of Orkney, Pentland, etc.) has proposed that these projects do not need to carry forward the Southern North Sea SAC for further consideration beyond HRA Screening. Advice from Natural England provided in the 2023 Scoping Opinion for Cenos requested further consideration be given to the Berwickshire and North Northumberland Coast SAC but did not explicitly request the Southern North Sea SAC be considered for LSE from Project activities. On this basis, the following activities have been considered for their connectivity and potential to generate LSE to the harbour porpoise population associated with this protected site.

a Increase in Underwater Noise

Project specific underwater noise modelling has not yet been completed but will be completed in support of the EIAR and RIAA. Underwater noise from pre-construction surveys and UXO clearance, as well as during percussive piling of the OSCP and possibly the anchors, can cause disturbance, injury and in extreme instances, mortality, to harbour porpoise. Based on project-specific survey data, the project does not anticipate requirements for extensive UXO clearance. Moreover, any potential for injury or mortality will be suitably mitigated via best practice guidance for all activities. However, the project will seek to understand the potential for injury and mortality to occur, prior to the application of mitigations, via dedicated noise modelling. Moreover, disturbance related impacts may have disproportionate effects on populations during vulnerable periods.

Existing JNCC guidance on noise management in harbour porpoise SACs[14] indicates that the effective deterrent radius for disturbance impacts will occur approximately 12 km from the site of seismic airgun arrays, 5 km from sub-bottom profilers, 15 km for pin-piling and 26 km from the location of UXO detonation and monopile installation (without noise abatement). However, the project-specific zone of influence for these noise-generating activities will be determined through dedicated underwater noise modelling, and impacts will be characterised on both individual and population levels.

The distances over which underwater noise would propagate are considered too great to have the potential to impact a portion of the population of harbour porpoises protected by the Southern North Sea SAC. Particularly, as the Project area does not form primary or preferred habitat to harbour porpoise in the North Sea MU, as supported by the low numbers of individuals recorded during the site-specific surveys. As such, there is limited scope for connectivity between the Project's noise generating activities and individuals associated with the Southern North Sea SAC.

For these reasons, it is considered that there is negligible potential for LSE on harbour porpoise as qualifying features of the Southern North Sea SAC based on connectivity with the features of this site and the potential for their spatial overlap with underwater noise generating activities in a manner which could undermine site integrity or the conservation objectives of this site.

b Vessel Disturbance

Vessel activities in the marine environment generate a variety of behavioural responses from marine mammals, from active evasive manoeuvring to bowriding. These differences often reflect individual behaviour at the time of interaction (e.g. travel, resting, foraging, socialising, nursing, etc.), and species or taxa-specific morphological and behavioural differences (i.e. potentially reflected by size and speed and whether positive or negative behavioural responses are more likely).

It is difficult to decouple whether disturbance is caused by the physical presence of the vessels, the underwater noise generated by them, or a combination of the two. Vessel-related disturbance to marine mammals is fairly spatially constrained, relative to the home ranges or migratory distances covered by the majority of species. Indeed, the physical presence of the vessel should only generate a response over distances within which the vessel could be sensed, such as over visual distance. Underwater noise from vessels is expected to generate disturbance impacts over a greater distance than would be generated by physical presence, due to the propagation of low frequency sound in the marine environment. To ensure the potential vessel-related disturbance effects are fully characterised, dedicated noise modelling will be undertaken to support the EIAR and RIAA which considers underwater noise from vessels.

However, given the distance of vessel activities from the protected site and limited connectivity with its protected features, the potential for vessel-related activities to result in a disturbance-mediated LSE on the harbour porpoise population associated with the Southern North Sea SAC is considered negligible and is therefore screened out for further consideration for this site.

c Offshore Vessels Interaction with Marine Mammals Resulting in Injury and/Mortality

Vessel activities, including transiting to and from site, will be restricted to the boundaries of the Project and along routes to local ports. The risk of an injury-inducing or fatal collision with a marine mammal is influenced by the colocation of marine mammals and vessels and whether those animals are exposed to vessels on a regular basis[19]. The increase in vessel traffic associated with the various phases of the Project is likely to be low compared to background levels, given the Array Area and ECC occur in regions utilised by various maritime industries (i.e. fishing, oil and gas, shipping, etc.). Indeed, harbour porpoise along the east coast of the UK encounter a wide variety of industrial and recreational vessels across their range and, as their name suggests, many temporarily occupy ports or harbours without issue.

Avoidance behaviour exhibited by cetaceans is often associated with unpredictable boats transiting at higher speeds[3 4 5 6]. Slower vessels following a consistent trajectory allow marine mammals the opportunity to avoid collisions. The probability of collision is estimated to decrease to less than 50 percent when large vessels reduce speeds to 10 knots[20] and fatal collisions are more likely when vessels are transiting at higher speeds[8 9]. Project vessels will be operating at slow speeds and many will be stationary (holding position) for construction, maintenance and decommissioning works, so the potential for collision is considered very limited. Moreover, any disturbance effects from vessel activities (as detailed above) would further reduce the potential for collision risk to harbour porpoise.

The potential for project-related vessel activities to result in injurious or fatal collision which would have a LSE on the harbour porpoise population associated with the Southern North Sea SAC is considered negligible and is therefore screened out for further consideration for this site.

d Changes to Prey Resources

The Project area does not support the primary habitat or features which support prey populations relevant to harbour porpoise, which include waters shallower than 40 m in depth and sandy, course sediments. Rather, relatively few harbour porpoise have been seen within the Project area across survey months and years, indicating it does not offer stable or optimal foraging opportunities to this species.

For this reason, it is considered that the potential for project activities to result in changes to prey resources which could have a LSE on harbour porpoise as a qualifying feature of the Southern North Sea SAC is considered negligible and is therefore screened out for further consideration for this site.

e Accidental Spills to the Marine Environment

There is a risk of pollution being accidentally released from vessels and equipment involved during the construction phase of the Project. Pollution events are considered unlikely, and given the volumes associated with offshore windfarm developments, should an event occur, effects will be temporary, reversible and limited in spatial extent (for example, due to the expected low volumes of pollutants associated with offshore wind developments).

The risk of pollution events will be managed by the implementation of an Environmental Management Plan and Marine Pollution Contingency Plan. These plans will provide planning for accidental spills and address potential contaminant releases. All vessels to be used as part of any phase of the Project will adopt a waste management plan in line with the requirements set out as part of the MARPOL[11] and the SOPEP.

The potential for project-related activities to result in an accidental spill which would have a LSE on the harbour porpoise population associated with the Southern North Sea SAC is considered negligible and is therefore screened out for further consideration for this site.

f Potential Changes to Suspended Sediment Concentrations

Sediment disturbance arising from construction, operations and maintenance, and decommissioning activities (e.g. anchoring and cable installation, and seabed preparation works) may result in temporary increases in SSC which can directly impact the foraging ability of marine mammals. Indirect effects may also occur as a result of impacts to prey species from SSC (these are considered under 'changes to prey availability'). Harbour porpoise are well known to forage in tidal areas where water conditions are turbid and visibility conditions poor. For example, harbour porpoise in the UK have been documented foraging in areas with high tidal flows; therefore, low light levels, turbid waters and suspended sediments are unlikely to adversely impact harbour porpoise foraging success. When the visual sensory systems of odontocetes are compromised, they are able to sense the environment in other ways, primarily using echolocation to navigate and find food in darkness for example.

There is likely to be large natural variability in the SSC within the 20 km tidal range. No designated sites are found within this distance however marine mammals transiting through this area are likely to be tolerant of any small-scale increases, such as those associated with all phases of the Project. The localised and short-term nature of increases in SSC generated by project activities are unlikely to result in a significant effect on the foraging or reproductive success, or survivorship, in this species.

The potential for project activities to result in changes to SSC which would have a LSE on the harbour porpoise population associated with the Southern North Sea SAC is considered negligible and is therefore screened out for further consideration for this site.

g Presence of Offshore Structures Creating a Physical Barrier Effect

There is currently no evidence to indicate that a floating offshore wind farm site could cause a barrier to movement for harbour porpoise or any other marine mammal species. A literature review conducted for Equinor on floating windfarms and potential barrier effects[21], cited several studies where marine mammals, including harbour porpoise and grey seals, were observed in the vicinity of operational fixed wind farms[16] [17] and foraging around Oil and Gas platforms[18]. The wide spacing of (target of at least 1 km) between turbine structures at the surface and a minimum of 500 m between submarine structures will allow passage of marine mammals through the area unimpeded. There will be a maximum of nine mooring lines per WTG with a mooring radius of approximately 850 m. The footprint of these structures is minimal compared to the available space within the Array Area, moreover, harbour porpoise are several orders of magnitude smaller than the infrastructure in question, allowing individuals to readily travel through the area unaffected.

The potential for the presence of offshore structures to create a physical barrier effect which would have a LSE on the harbour porpoise population associated with the Southern North Sea SAC is considered negligible and is therefore screened out for further consideration for this site.

h In-combination Effects

Given that no effect pathway to LSE exists for the feature of this SAC, the potential for in-combination effects with other plans and projects is not considered.

2.4 Transboundary SACs

Table 2-4: LSE Matrix for harbour porpoise as a qualifying feature of all other European SACs

Distance from Project																Over 200km from ECC and Array Area								
Feature	underwater noise			Vessel disturbance			Offshore vessels interaction with marine mammals			Changes to prey resources			Accidental spills to the marine environment			Potential changes to suspended sediment concentrations			Presence of offshore structures creating a physical barrier effect			In-combination effects		
	C	OM	D	C	OM	D	C	OM	D	C	OM	D	C	OM	D	C	OM	D	C	OM	D	C	OM	D
Harbour porpoise	Xa	Xa	Xa	Xb	Xb	Xb	Xc	Xc	Xc	Xd	Xd	Xd	Xe	Xe	Xe	Xf	Xf	Xf		Xg		Xh	Xh	Xh

List of sites:

1. Doggersbank SAC
2. Doggerbank SCI
3. Klaverbank SAC
4. Sydlige Nordsø SAC
5. Gule Rev SAC
6. Sylter Außenriff SCI
7. SPA Ostliche Deutsche Bucht
8. Vadehavet med Ribe Å, Tved Å og Varde Å vest for Varde SAC
9. Borkum-Riffgrund SCI
10. Store Rev SAC
11. NTP S-H Wattenmeer und angrenzende Kustengebiete SAC
12. Noordzeekustzone SAC
13. Waddenzee SAC
14. Nationalpark Niedersachsisches Wattenmeer SAC
15. Skagens Gren og Skagerrak SAC
16. Helgoland mit Helgolander Felssockel SAC
17. Steingrund SAC
18. Hamburgisches Wattenmeer SAC
19. Kosterfjorden-Väderöfjorden SAC
20. Unterelbe SAC
21. Voordelta
22. Duinen Goeree & Kwade Hoek SAC
23. Grevelingen SAC
24. Oosterschelde
25. Vlaamse Banken SAC
26. Vlakte van de Raan SAC
27. Vlakte van de Raan SCI
28. Westerschelde & Saeftinghe SAC
29. Bancs des Flandres SAC
30. Recifs Gris-Nez Blanc-Nez SAC
31. Ridens et dunes hydrauliques du detroit du Pas-de-Calais SAC
32. Falaises du Cran aux Oeufs et du Cap Gris-Nez, Dunes du Chatelet, Marais de Tardinghen et Dunes de Wissant SAC
33. Baie de Canche et couloir des trois estuaires SAC
34. Baie de Seine occidentale SAC
35. Baie de Seine orientale SAC

a Underwater Noise

All other European sites designated for harbour porpoise are located over 200 km from the Project Area, and a significant effect is therefore considered unlikely. Based on monthly aerial surveys conducted 2021 - 2023, the most common marine mammal in the Project area is the harbour porpoise (152 over the entire survey period). No Project specific noise modelling has been undertaken but existing JNCC guidance for noise impacts in harbour porpoise[14] indicates that disturbance impacts will occur approximately 15 km from the site for pin piling. Therefore, given the distance from the designated Project Area to the proposed windfarm it is not expected that there will be a LSE for underwater noise impacts. Consequently, all transboundary sites for harbour porpoise are screened out for this impact.

b Vessel Disturbance

All other European sites designated for harbour porpoise are located over 200 km from the Project Area, and a significant effect is considered unlikely. Therefore, all transboundary sites for harbour porpoise are screened out for this impact.

c Offshore Vessels Interaction with Marine Mammals

All other European sites designated for harbour porpoise are located over 200 km from the Project Area, and a significant effect is considered unlikely. Therefore, all transboundary sites for harbour porpoise are screened out for this impact.

d Changes to Prey Resources

All other European sites designated for harbour porpoise are located over 200 km from the Project Area, and a significant effect is considered unlikely. Therefore, all transboundary sites for harbour porpoise are screened out for this impact.

e Accidental Spills to the Marine Environment

All other European sites designated for harbour porpoise are located over 200 km from the Project Area, and a significant effect is considered unlikely. Therefore, all transboundary sites for harbour porpoise are screened out for this impact.

f Temporary Increase in Suspended Sediments

All other European sites designated for harbour porpoise are located over 200 km from the Project Area, and a significant effect is considered unlikely. Therefore, all transboundary sites for harbour porpoise are screened out for this impact.

g Barrier Effects due to Presence of Infrastructure

There is currently no evidence to indicate that a floating offshore wind farm site could cause a barrier to movement for bottlenose dolphins or any other marine mammal species. A literature review conducted for Equinor on floating windfarms and potential barrier effects[21] cited several studies where marine mammals including harbour porpoise and grey seal were observed in the vicinity of operational fixed wind farms[16] [17] and foraging around Oil and Gas platforms[18]. The sites are 200 km (minimum) from the Project area and given the large foraging ranges for this species and the alternative routes available, no LSE is expected.

h In-combination Effects

Given that no effect pathway to LSE exists for the feature of this SAC, the potential for in-combination effects with other plans and projects is not considered.

3. ORNITHOLOGICAL MATRICES

3.1 Buchan Ness to Collieston Coast SPA

Table 3-1: LSE Matrix for marine ornithological features of Buchan Ness and Collieston Coast SPA

Distance from Project				0 km from ECC; 186 km from Array Area											
Feature	Disturbance from vessels			Distributional responses			Collision risk			Changes in prey availability and behaviour			In-combination effects		
	C	OM	D	C	OM	D	C	OM	D	C	OM	D	C	OM	D
Kittiwake (breeding)	Xa	Xa	Xa		✓b			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Herring gull (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Guillemot (breeding)	✓a	✓a	✓a		✓b			Xc		Xd	Xd	Xd	✓e	✓e	✓e
Shag (breeding)	✓a	✓a	✓a		Xb			Xc		Xd	Xd	Xd	✓e	✓e	✓e
Fulmar (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Seabird assemblage (breeding)*	✓a	✓a	✓a		✓b			✓c		Xd	Xd	Xd	✓e	✓e	✓e

*Note that where one of the above potential pathways to LSE exist for a component feature, by definition it also exists for the wider qualifying breeding seabird assemblage.

a Disturbance from Vessels

Kittiwake, herring gull and fulmar are not considered to be highly sensitive to disturbance[24]. Considering that disturbance effects from vessels are likely be localised and temporary, LSE can be excluded.

While likely to be localised and temporary, there may be temporary disturbance and displacement effects during the construction of the Project in both the ECC and Array Areas. The ECC is in foraging range of both guillemot and shag; both features are moderately sensitive disturbance and LSE cannot be excluded...

b Distributional Responses

During the operation and maintenance phase, kittiwake foraging range may extend to the Array Area during the breeding and non-breeding seasons, hence populations may be affected by displacement or barrier effects from the presence of WTGs and regular maintenance activity with the Project. LSE cannot be excluded. During the operation and maintenance phase, guillemot foraging range does not extend to the Array Area. Considering the relative proximity of the SPA, there remains some potential for interaction in the non-breeding season. LSE cannot be excluded.

Herring gull and shag foraging range does not extend to the Array Area during the breeding season. Hence populations will not be affected by displacement or barrier effects from the presence of WTGs and regular maintenance activity with the Project. Fulmar are not considered to be sensitive to disturbance[24]. Considering that disturbance effects from vessel are likely be localised and temporary, LSE can be excluded.

c Collision Risk

There is potential for collision with WTGs for kittiwake during both the breeding and non-breeding seasons, given that this feature may forage within the Array Area and is known to fly within the ‘at risk’ height range within the rotor swept area. LSE therefore cannot be excluded for this feature at any time of the year. While fulmar and guillemot may also forage within the Array Area during the breeding and non-breeding seasons, these features generally fly below the rotor swept area and therefore are unlikely to be impacted. Shags foraging range does not overlap the Array Area, and the species is not vulnerable to collisions. LSE can be excluded for these features at all times of the year.

d Changes to Prey Availability and Behaviour

The presence of the Project does not have potential to impact the foraging of kittiwake, herring gull, guillemot, shag, or fulmar with limited effects predicted on prey species and the project being sited away from core foraging areas. LSE can therefore be excluded.

e In-combination Effects

Given that at least one effect pathway exists for kittiwake, guillemot, and shag features of the SPA, the potential for in-combination effects with other plans and projects remains. For herring gull and fulmar no pathway to LSE exists so the potential for in-combination effects for other plans and projects can be excluded.

3.2 Loch of Strathbeg SPA

Table 3-2: LSE Matrix for marine and migratory waterbird ornithological features of Loch of Strathbeg SPA

Distance from Project							16 km from ECC; 195 km from Array Area								
Feature	Disturbance from vessels			Distributional responses			Collision risk			Changes in prey availability and behaviour			In-combination effects		
	C	OM	D	C	OM	D	C	OM	D	C	OM	D	C	OM	D
Sandwich tern (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Svalbard barnacle goose (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Pink-footed goose (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Greylag goose (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	Xe	Xe
Whooper Swan (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Goldeneye (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Teal (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe

a Disturbance from Vessels

Sandwich tern are not notably vulnerable to disturbance from ship traffic, although the ECC is within foraging range, sufficient alternative marine habitat is available for foraging in the unlikely event that this species is disturbed, LSE can therefore be excluded.

The migratory waterbirds from this SPA (barnacle goose, pink-footed goose, greylag goose, whooper swan, goldeneye, and teal) will not utilise habitat in the marine environment for foraging, and therefore will be unaffected by this impact. LSE can be excluded.

b Distributional Responses

During the O&M phase, Sandwich tern foraging range will not extend to the Array Area. LSE is therefore excluded.

The migratory waterbirds from this SPA (barnacle goose, pink-footed goose, greylag goose, whooper swan, goldeneye, and teal) will not utilise habitat in the marine environment for foraging and therefore will be unaffected by disturbance or displacement. LSE can be excluded.

c Collision Risk

The presence of the Project does not have potential to impact the foraging Sandwich tern with limited effects predicted on prey species and the Project being sited away from core foraging areas. LSE can therefore be excluded.

The MSS strategic assessment report concluded that at a strategic level, the populations of non-seabird species which pass through Scottish waters do not appear to be at risk of significant levels of additional mortality due to collisions wit h Scottish offshore windfarms.

It is however evident the number of offshore wind projects and therefore the number of WTGs has increased notably since the publication of the MSS report. An update to the collision risk for migrating birds in Scottish waters was completed by the British Trust for Ornithology in 2023[22]. A CRM specifically for migratory birds is not currently available and Woodward *et al*.[31]outline the scope of a stochastic tool that will be part of a subsequent work package.

The Array Area is considerably offshore, located approximately 185 km offshore east of Aberdeen, and it is considered likely that interactions with migratory birds will be limited. However, considering that Woodward *et al.* [31] outlines that there is, to some degree, potential connectivity for all species from this SPA, except for greylag goose, LSE cannot at this stage be excluded for barnacle goose, pink-footed goose, whooper swan, goldeneye and teal.

d Changes in Prey availability and Behaviour

The presence of the Project does not have potential to impact the foraging of Sandwich tern with limited effects predicted on prey species and the Project being sited away from core foraging areas. LSE can therefore be excluded.

The migratory waterbirds from this SPA (barnacle goose, pink-footed goose, greylag goose, whooper swan, goldeneye and teal) will not utilise habitat in the marine environment for foraging and therefore LSE can be excluded.

e In-combination Effects

Given that at least one effect pathway to LSE exists for barnacle goose, pink-footed goose, whooper swan, goldeneye and teal features (associated with the risk of collision with WTGs), the potential for in-combination effects with other plans and projects remains. For Sandwich tern and greylag goose no pathway to LSE exists so the potential for in-combination effects for other plans and projects can be excluded.

3.3 Ythan Estuary, Sands of Forvie and Meikle Loch SPA

Table 3-3: LSE Matrix for marine ornithological features of Ythan Estuary, Sands of Forvie and Meikle Loch SPA

Distance from Project							5 km from ECC; 190 km from Array Area								
Feature	Disturbance from vessels			Distributional responses			Collision risk			Changes in prey availability and behaviour			In-combination effects		
	C	OM	D	C	OM	D	C	OM	D	C	OM	D	C	OM	D
Common tern(breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Sandwich tern (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Little tern (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Pink-footed goose (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Eider (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Redshank (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Lapwing (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Waterbird assemblage (non-breeding)*	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe

*Note that where one of the above potential pathways to LSE exist for a component feature, by definition it also exists for the wider qualifying non-breeding waterbird assemblage.

a Disturbance from Vessels

Tern species are not notably vulnerable to disturbance from ship traffic. Although the ECC is within foraging range, sufficient alternative marine habitat is available for foraging in the unlikely event that these features are disturbed, LSE can be therefore excluded.

The migratory waterbirds from this SPA (pink-footed goose, eider, redshank and lapwing) will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.

b Distributional Responses

During the operations and maintenance phase, common tern, Sandwich tern or little tern foraging ranges will not extend to the Array Area and there is considered to be no prospect of interaction in non-breeding periods. LSE can be excluded on this basis.

The migratory waterbirds from this SPA (pink-footed goose, eider, redshank and lapwing) will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.

c Collision Risk

The Array Area is outside of foraging range for tern species and there is considered to be no prospect of interaction in non-breeding periods. LSE can therefore be excluded.

The MSS strategic assessment report concluded that at a strategic level, the populations of non-seabird species which pass through Scottish waters do not appear to be at risk of significant levels of additional mortality due to collisions with Scottish offshore windfarms. It is however evident the number of offshore wind projects and therefore the number of WTGs has increased notably since the publication of the MSS report. An update to the collision risk for migrating birds in Scottish waters was completed by the British Trust for Ornithology in 2023[22]. A CRM specifically for migratory birds is not currently available and Woodward *et al*. [31]outline the scope of a stochastic tool that will be part of a subsequent work package. The Array Area is considerably offshore, located approximately 185 km offshore east of Aberdeen, and it is considered likely that interactions with migratory birds will be limited. However, considering that Woodward *et al.* [31] outlines that there is, to some degree, potential connectivity for all species from this SPA (pink-footed goose, eider, redshank and lapwing), LSE cannot at this stage be excluded.

d Changes in Prey Availability and Behaviour

The presence of the Project does not have potential to impact the foraging of tern species with limited effects predicted on prey species and the Project being sited away from core foraging areas.

The migratory waterbirds from this SPA (pink-footed goose, eider, redshank and lapwing) will not utilise habitat in the marine environment for foraging and therefore LSE can be excluded.

e In-combination effects

Given that an effect pathway to LSE exists in association with the risk of collision with WTGs for migratory waterbirds (pink-footed goose, eider, redshank and lapwing), the potential for in-combination effects with other plans and projects remains. For common tern, Sandwich tern and little tern no pathway to LSE exists so the potential for in-combination effects for other plans and projects can be excluded.

3.4 Fowlsheugh SPA

Table 3-4: LSE Matrix for marine ornithological features of Fowlsheugh SPA

Distance from Project							61 km from ECC; 210 km from Array Area								
Feature	**Vessel disturbance**			**Distributional responses**			**Collision risk**			**Changes in prey availability and behaviour**			**In-combination effects**		
	C	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**
Kittiwake (breeding)	Xa	Xa	Xa		✓b			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Herring gull (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Razorbill (breeding)	✓a	✓a	✓a		✓b			Xc		Xd	Xd	Xd	✓e	✓e	✓e
Guillemot (breeding)	✓a	✓a	✓a		✓b			Xc		Xd	Xd	Xd	✓e	✓e	✓e
Fulmar (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Seabird assemblage (breeding)*	✓a	✓a	✓a		✓b			✓c		Xd	Xd	Xd	✓e	✓e	✓e

*** Note that where one of the above potential pathways to LSE exist for a component feature, by definition it also exists for the wider qualifying breeding seabird assemblage.**

a Vessel Disturbance

Kittiwake, herring gull and fulmar are not considered to be highly sensitive to disturbance[24]. Considering that disturbance effects from vessels are likely be localised and temporary, LSE can be excluded.

Razorbill and guillemot foraging range does not extend to the Array Area but does so to the ECC. While likely to be localised and temporary, there may be temporary disturbance and displacement effects during the construction of the Project. This may extend to guillemot present in the ECC and, in the non-breeding season only, the Array Area. Razorbill and guillemot are moderately sensitive to disturbance and LSE cannot be excluded.

b Distributional Responses

During the operation and maintenance phase, kittiwake foraging range may extend to the Array Area during the breeding and non-breeding seasons, hence populations may be affected by displacement or barrier effects from the presence of WTGs and regular maintenance activity with the Project. LSE cannot be excluded for these features during this phase of the Project.

Herring gull foraging range does not extend to the Array Area during the breeding season. Hence populations will not be affected by displacement or barrier effects from the presence of WTGs and regular maintenance activity with the Project. In addition, large gulls are not known to be sensitive to the presence of WTGS[23]. LSE can be excluded for these features at any time of the year.

Razorbill and guillemot foraging range does not extend to the Array Area but does so to the ECC. Razorbill and guillemot from this SPA may interact with the Array Area in the non-breeding season. Hence populations may be affected by displacement or barrier effects from the presence of WTGs and regular maintenance activity with the Project. LSE cannot be excluded.

While fulmar may forage within the Array Area, this species has a particularly large foraging range and therefore has extensive alternative marine habitats available. Fulmar is not vulnerable to distributional responses. LSE can therefore be excluded.

c Collision Risk

There is a potential risk of collision with WTGs for kittiwake in the breeding and non-breeding seasons given that these features may forage within the Array Area and are known to fly within the 'at risk' height range within the rotor swept area. LSE cannot be excluded.

The Array Area is outside of foraging range of herring gull. Herring gull may be present in the non-breeding season; however, the population at that season will incorporate birds from a wide variety of sources. The DAS for the Project also recorded a very low abundance of this species (raw count of five individuals). Therefore, LSE can be confidently ruled out.

Guillemot and razorbill are not vulnerable to collision events as they fly below the rotor swept area. In any case, the foraging range of razorbill and guillemot is such that there is no connectivity with the Array Area. LSE can be excluded.

Fulmar is not vulnerable to collision effects as a high proportion of birds fly below the rotor swept area. LSE can therefore be excluded.

d Changes to Prey Availability

The presence of the Project does not have potential to impact the foraging of all qualifying features with limited effects predicted on prey species and the project being sited away from core foraging areas.

e In-combination Effects

Given effect pathways to LSE exists for some features of the SPA (kittiwake, razorbill and guillemot), the potential for in-combination effects with other plans and projects remains. The exception in this regard are herring gull and fulmar, for which effect pathways have not been identified and, therefore, there is no potential for contribution to in-combination effects.

3.5 Troup, Pennan and Lion's Head SPA

Table 3-5: LSE Matrix for marine ornithological features of Troup, Pennan and Lion's Head SPA

Distance from Project							**34 km from ECC; 216 km from Array Area**								
Feature	**Vessel disturbance**			**Distributional responses**			**Collision risk**			**Changes in prey availability and behaviour**			**In-combination effects**		
	C	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**
Kittiwake (breeding)	Xa	Xa	Xa		✓b			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Herring gull (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Razorbill (breeding)	✓a	✓a	✓a		✓b			Xc		Xd	Xd	Xd	✓e	✓e	✓e
Guillemot (breeding)	✓a	✓a	✓a		✓b			Xc		Xd	Xd	Xd	✓e	✓e	✓e
Fulmar (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Seabird assemblage (breeding)*	✓a	✓a	✓a		✓b			✓c		Xd	Xd	Xd	✓e	✓e	✓e

*Note that where one of the above potential pathways to LSE exist for a component feature, by definition it also exists for the wider qualifying breeding seabird assemblage.

a Vessel disturbance

Kittiwake are not considered to be sensitive to disturbance[24]. Considering that disturbance effects from vessels are likely be localised and temporary, LSE can be excluded.

The foraging range of herring gull shows that there will be no connectivity with the Array Area. While herring gull may be present in the ECC, the alternative habitat available and the species' low sensitivity to disturbance means that LSE can be excluded in both the breeding and non-breeding seasons.

Guillemot and razorbill foraging range does not extend to the Array Area but does so to the ECC. While likely to be localised and temporary, there may be temporary disturbance and displacement effects during the construction of the Project. This may extend to guillemot present in the ECC and, in the non-breeding season only, the Array Area. Guillemot and razorbill are moderately sensitive disturbance and LSE cannot be excluded.

Fulmar are not considered to be sensitive to disturbance[24]. Considering that disturbance effects from vessel are likely be localised and temporary, LSE can be excluded.

b Distributional Responses

During the operation and maintenance phase, kittiwake foraging range may extend to the Array Area during the breeding and non-breeding seasons, hence populations may be affected by displacement or barrier effects from the presence of WTGs and regular maintenance activity with the Project. LSE cannot be excluded for these features at any time of the year during this phase of the Project.

Herring gull foraging range does not extend to the Array Area so that LSE can be ruled out. Hence populations will not be affected by displacement or barrier effects from the presence of WTGs and regular maintenance activity with the Project. In addition, large gulls are not known to be sensitive to the presence of WTGS[23]. LSE can be excluded for these features at any time of the year during this phase of the Project.

Guillemot and razorbill foraging range does not extend to the Array Area but does so to the ECC In addition, guillemot and razorbill from this SPA may interact with the Array Area in the non-breeding season. hence populations may be affected by displacement or barrier effects from the presence of WTGs and regular maintenance activity with the Project. LSE cannot be excluded for these features during this phase of the Project.

While fulmar may forage within the Array Area, this species has a particularly large foraging range and therefore has extensive alternative marine habitats available. Fulmar is not highly vulnerable to distributional responses. LSE can therefore be excluded.

c Collision Risk

There is potential for collision with WTGs for kittiwake in the breeding and non-breeding seasons given that these features may forage within the Array Area and are known to fly within the ‘at risk’ height range within the rotor swept area. LSE cannot be excluded.

Herring gull foraging range does not extend to the Array Area. DAS recorded very low numbers of this species (five individuals in the Array Areas) and these birds will be from a wide variety of sources. LSE can therefore be excluded.

Guillemot, razorbill and fulmar are not vulnerable to collision events as they fly below the rotor swept area. LSE can be excluded.

d Changes to Prey Availability

The presence of the Project does not have potential to impact the foraging of any qualifying features with limited effects predicted on prey species and the Project being sited away from core foraging areas.

e In-combination Effects

Given that effect pathways to LSE exists for kittiwake, razorbill and guillemot, the potential for in-combination effects with other plans and projects remains. The exceptions in this regard are herring gull and fulmar, for which effect pathways have not been identified and, therefore, there is no potential for contribution to in-combination effects.

3.6 St. Abb's Head to Fast Castle SPA

Table 3-6: LSE Matrix for marine ornithological features of St. Abb's Head to Fast Castle SPA

Distance from Project							170 km from ECC; 245 km from Array Area								
Feature	Vessel disturbance			Distributional responses			Collision risk			Changes in prey availability and behaviour			In-combination effects		
	C	OM	D	C	OM	D	C	OM	D	C	OM	D	C	OM	D
Kittiwake (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Herring gull (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Guillemot (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Razorbill (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Shag (breeding	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Seabird assemblage (breeding)*	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe

* Note that where one of the above potential pathways to LSE exist for kittiwake, by definition it also exists for the wider qualifying breeding seabird assemblage.

a Vessel Disturbance

Kittiwake are not considered to be highly sensitive to disturbance[24]. Considering that disturbance effects from vessels are likely be localised and temporary and that tracking data shows no interaction with the Projects region, LSE can therefore be excluded.

The ECC and Array Area are not in foraging range of either herring gull, guillemot, razorbill or shag. In addition, there is considered to be no prospect of these qualifying features interacting with the Project in the non-breeding season, LSE can be excluded.

b Distributional Responses

Tracking data of kittiwake from this SPA shows no interaction with the Projects region, LSE can therefore be excluded.

The Array Area is not in foraging range of either herring gull, guillemot, razorbill or shag. In addition, there is considered to be no prospect of these qualifying features interacting with the Project in the non-breeding season, LSE can be excluded.

c Collision Risk

Tracking data of kittiwake from this SPA shows no interaction with the Projects region, LSE can therefore be excluded.

The Array Area is not in foraging range of either herring gull, guillemot, razorbill or shag. In addition, there is considered to be no prospect of these qualifying features interacting with the Project in the non-breeding season, LSE can be excluded.

d Changes to Prey Availability and Behaviour

Tracking data of kittiwake from this SPA shows no interaction with the Projects region, LSE can therefore be excluded.

e In-combination Effects

No effect pathway to LSE exists for any qualifying feature, the potential for in-combination effects with other plans and projects can be excluded.

3.7 Farne Islands SPA

Table 3-7: LSE Matrix for marine ornithological features of Farne Islands SPA

Distance from Project							**201 km from ECC; 237 km from Array Area**								
Feature	**Vessel disturbance**			**Distributional responses**			**Collision risk**			**Changes in prey availability and behaviour**			**In-combination effects**		
	C	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**
Herring gull (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Guillemot (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Puffin (breeding)	✓a	✓a	✓a		✓b			Xc		Xd	Xd	Xd	✓e	✓e	✓e
Shag (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Cormorant (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Arctic tern (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Common tern (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Roseate tern (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Sandwich tern (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Seabird assemblage (breeding)*	✓a	✓a	✓a		✓b			Xc		Xd	Xd	Xd	✓e	✓e	✓e

*** Note that where one of the above potential pathways to LSE exists for a component feature, by definition it also exists for the wider qualifying breeding seabird assemblage.**

a Vessel Disturbance

Puffin foraging range extends to the Array Area and ECC. While likely to be localised and temporary, there may be temporary disturbance effects from vessel activities. LSE cannot be excluded.

The ECC and Array Area are not in foraging range of either herring gull, guillemot, razorbill, cormorant, shag, Arctic tern, common tern, roseate tern or Sandwich tern. In addition, there is considered to be no prospect of these qualifying features interacting with the Project in the non-breeding season, LSE can be excluded.

b Distributional Responses

Puffin foraging range extends to the Array Area and ECC. Puffin are moderately sensitive to distributional responses and populations may be affected by distributional responses during the operation and maintenance phase. LSE cannot be excluded.

The Array Area is not in foraging range of either herring gull, guillemot, razorbill, cormorant, shag, Arctic tern, common tern, roseate tern or Sandwich tern. In addition, there is considered to be no prospect of these qualifying features interacting with the Project in the non-breeding season, LSE can be excluded.

c Collision Risk

While puffin may forage within the Array Area, this feature generally flies below the rotor swept area and therefore is unlikely to be affected. LSE can be excluded for the feature at all times of the year.

The Array Area is not in foraging range of either herring gull, guillemot, razorbill, cormorant, shag, Arctic tern, common tern, roseate tern or Sandwich tern. In addition, there is considered to be no prospect of these qualifying features interacting with the Project in the non-breeding season, LSE can be excluded.

d Changes to Prey Availability

The presence of the Project does not have potential to impact the foraging of this species with limited effects predicted on prey species and the Project being sited away from core foraging areas. LSE can be excluded.

e In-combination Effects

Given effect pathway to LSE exists puffin (from vessel disturbance and distributional responses), the potential for in-combination effects with other plans and projects remains. Effect pathways have not been identified for any other qualifying feature and, therefore, there is no potential for contribution to in-combination effects.

3.8 Forth Islands SPA

Table 3-8: LSE Matrix for marine ornithological features of Forth Islands SPA

Distance from Project							145 km from ECC; 251 km from Array Area								
Feature	**Vessel disturbance**			**Distributional responses**			**Collision risk**			**Changes in prey availability and behaviour**			**In-combination effects**		
	C	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**
Arctic tern (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Roseate tern (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Common tern (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Sandwich tern (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Gannet (breeding)	Xa	Xa	Xa		✓b			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Kittiwake (breeding)	Xa	Xa	Xa		✓b			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Lesser black-backed gull (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Razorbill (breeding)	✓a	✓a	✓a		✓b			Xc		Xd	Xd	Xd	✓e	✓e	✓e
Puffin (breeding)	✓a	✓a	✓a		✓b			Xc		Xd	Xd	Xd	✓e	✓e	✓e
Shag (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Cormorant	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Guillemot	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Herring gull	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Seabird assemblage (breeding)*	✓a	✓a	✓a		✓b			✓c		Xd	Xd	Xd	✓e	✓e	✓e

*** Note that where one of the above potential pathways to LSE exist for a component feature, by definition it also exists for the wider qualifying breeding seabird assemblage.**

a Vessel Disturbance

The foraging range of all tern species, herring gull, guillemot, cormorant and shag does not reach the Array Area or ECC. It is additionally noted that there is little prospect of these features interacting with the Project in the non-breeding season. LSE can be excluded.

Foraging range of gannet extends to the Array Area and ECC. Gannet are however are not considered to be highly sensitive to disturbance. Considering that disturbance effects from vessel are likely be localised and temporary, LSE can be excluded. Likewise, kittiwake and lesser black-backed gull are also not considered to be sensitive to such disturbance and LSE can again be excluded.

Razorbill foraging range does not extend to the Array Area but does so to the ECC. Puffin foraging range extends to both the ECC and Array Area. While likely to be localised and temporary, there may be temporary disturbance and displacement effects during the construction of the Project. Razorbill and puffin are moderately sensitive disturbance and LSE cannot be excluded.

b Distributional Responses

The foraging range of all tern species, herring gull, guillemot, cormorant and shag does not reach the Array Area. LSE can be excluded. It is additionally noted that there is little prospect of these features interacting with the Project in the non-breeding season. LSE can be excluded.

During the operational and maintenance phase, kittiwake and gannet foraging range may extend to the Array Area during the breeding and non-breeding seasons, hence populations may be affected by displacement or barrier effects from the presence of WTGs and regular maintenance activity with the Project. LSE cannot be excluded for these features at any time of the year during this phase of the Project.

Lesser black-backed gull foraging range does not extend to the Array Area. No individuals of this species were recorded in DAS and LSE can therefore be excluded.

Razorbill foraging range does not extend to the Array Area. Puffin foraging range extends to the Array Area. Razorbill and puffin are moderately sensitive to distributional responses should they interact with the Project, populations may be affected by distributional responses during the operation and maintenance phase. As puffin foraging range reaches the Array Area LSE cannot be excluded. For razorbill while the prospect of interaction with the Array Area in the non-breeding season is limited LSE cannot be excluded.

c Collision Risk

There is potential for collision with WTGs for gannet and kittiwake, given that these features may forage within the Array Area and may fly within the ‘at risk’ height range within the rotor swept area during the breeding and non-breeding season. LSE cannot be excluded for these features at any time of the year.

LSE can be excluded for all tern species, herring gull, lesser black-backed gull, guillemot, cormorant and shag on the basis of the foraging range. Razorbill and puffin typically flow below collision risk height; LSE can therefore be excluded for these features.

d Changes to Prey Availability

The presence of the Project does not have potential to impact the foraging of all qualifying features with limited effects predicted on prey species and the Project being sited away from core foraging areas. LSE can be excluded.

e In-combination Effects

Given that at least one effect pathway to LSE exists for gannet, kittiwake, razorbill and puffin, the potential for in-combination effects with other plans and projects remains. The exceptions in this regard are tern species, guillemot, herring gull, lesser black-backed gull, cormorant and shag, for which effect pathways have not been identified and, therefore, there is no potential for contribution to in-combination effects.

3.9 East Caithness Cliffs SPA

Table 3-9: LSE Matrix for marine ornithological features of East Caithness Cliffs SPA

Distance from Project							125 km from ECC; 292 km from Array Area								
Feature	Vessel disturbance			Distributional responses			Collision risk			Changes in prey availability and behaviour			In-combination effects		
	C	OM	D	C	OM	D	C	OM	D	C	OM	D	C	OM	D
Kittiwake (breeding)	Xa	Xa	Xa		✓b			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Herring gull (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Great black-backed gull (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Razorbill (breeding)	✓a	✓a	✓a		✓b			Xc		Xd	Xd	Xd	✓e	✓e	✓e
Guillemot (breeding)	✓a	✓a	✓a		✓b			Xc		Xd	Xd	Xd	✓e	✓e	✓e
Fulmar (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Cormorant (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Shag (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Seabird assemblage (breeding)*	✓a	✓a	✓a		✓b			✓c		Xd	Xd	Xd	✓e	✓e	✓e

*** Note that where one of the above potential pathways to LSE exist for a component feature, by definition it also exists for the wider qualifying breeding seabird assemblage.**

a Vessel Disturbance

Kittiwake, herring gull, great black-backed gull and fulmar are not considered to be highly sensitive to disturbance[24]. Considering that disturbance effects from vessels are likely be localised and temporary, LSE can be excluded.

Guillemot and razorbill foraging range does not extend to the Array Area but do so to the ECC. While likely to be localised and temporary, there may be temporary disturbance effects from vessel activities. LSE cannot be excluded.

Shag and cormorant foraging range does not reach either the ECC or Array Area. LSE can be excluded.

b Distributional Responses

During the operation and maintenance phase, kittiwake foraging range may extend to the Array Area during the breeding and non-breeding seasons, hence populations may be affected by displacement or barrier effects from the presence of WTGs and regular maintenance activity with the Project. LSE cannot be excluded for these features at any time of the year during this phase of the Project.

Razorbill and guillemot foraging ranges do not extend to the Array Area but do to the ECC. These features' populations may be affected by disturbance/displacement during construction. LSE can therefore cannot be excluded for these features at any time of year.

Great black-backed and herring gull are not sensitive to distributional responses and in any case their foraging range does not reach the Array Area. LSE can be excluded. Fulmar is likewise not sensitive to distributional responses and LSE can be excluded.

Shag and cormorant foraging range does not reach the Array Area. LSE can be excluded.

c Collision Risk

There is potential for collision with WTGs for kittiwake, given that this feature may forage within the Array Area and may fly within the 'at risk' height range within the rotor swept area during both the breeding and non-breeding seasons. LSE therefore cannot be excluded for this feature at any time of the year.

While fulmar may also forage within the Array Area during the breeding and non-breeding seasons, fulmar generally fly below the rotor swept area and therefore are unlikely to be impacted. LSE can be excluded for these features at all times of the year. Razorbill and guillemot are likewise not sensitive to collision risk and LSE can be excluded.

The Array Area is outside of foraging range for both great black-backed gull and herring gull. While there is a possibility of these qualifying features interact with the Array Area in the non-breeding season, the presence for both species was extremely limited as recorded in the DAS. LSE can be excluded.

Shag and cormorant foraging range does not reach the Array Area. LSE can be excluded.

d Changes to Prey Availability and Behaviour

The presence of the Project does not have potential to impact the foraging of all qualifying features with limited effects predicted on prey species and the Project being sited away from core foraging areas. LSE can be excluded.

e In-combination Effects

Given that at least one effect pathway to LSE exists for kittiwake, guillemot and razorbill, the potential for in-combination effects with other plans and projects remains. The exceptions in this regard are for great black-backed gull, herring gull, cormorant, shag and fulmar, for which effect pathways have not been identified and therefore there is no potential for contribution to in-combination effects.

3.10 Copinsay SPA

Table 3-10: LSE Matrix for marine ornithological features of Copinsay SPA

Distance from Project	159 km from ECC; 289 km from Array Area														
Feature	Vessel disturbance			Distributional responses			Collision risk			Changes in prey availability and behaviour			In-combination effects		
	C	OM	D	C	OM	D	C	OM	D	C	OM	D	C	OM	D
Kittiwake (breeding)	Xa	Xa	Xa		✓b			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Great black-backed gull (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Fulmar (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Guillemot (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Seabird assemblage (breeding)*	Xa	Xa	Xa		✓b			✓c		Xd	Xd	Xd	Xe	✓e	Xe

*** Note that where one of the above potential pathways to LSE exist for a component feature, by definition it also exists for the wider qualifying breeding seabird assemblage.**

a Vessel Disturbance

Kittiwake, great black-backed gull and fulmar are not considered to be sensitive to disturbance[24]. Considering that disturbance effects from vessels are likely be localised and temporary, LSE can be excluded.

Guillemot foraging range does not reach either the ECC or Array Area. Considering the temporary nature of potential impacts and the availability of alternative habitat in this season LSE can be excluded.

b Distributional Responses

During the operation and maintenance phase, kittiwake foraging range may extend to the Array Area during the breeding and non-breeding seasons, hence populations may be affected by displacement or barrier effects from the presence of WTGs and regular maintenance activity with the Project. LSE cannot be excluded for these features at any time of the year during this phase of the Project.

While fulmar may also forage within the Array Area, this feature has a particularly large foraging range, and therefore has extensive alternative marine habitats available for foraging/roosting in case of disturbance/displacement. LSE can be excluded for this feature at all times of the year in this phase of the Project.

Great black-backed gull is not sensitive to distributional responses and LSE can be excluded. Guillemot foraging range does not approach the Array Area and there is little prospect of interaction with this feature in the non-breeding season. LSE can be excluded.

c Collision Risk

There is potential risk of collision with WTGs for kittiwake, given that this feature may forage within the Array Area and may fly within the 'at risk' height range within the rotor swept area during both the breeding and non-breeding seasons. LSE therefore cannot be excluded for this feature at any time of the year. While fulmar may also forage within the Array Area during the breeding and non-breeding season, this feature generally flies below the rotor swept area and therefore is unlikely to be impacted. LSE can be excluded for this feature at all times of the year.

Guillemot foraging range during the breeding season does not extend to the Array Area, and flight altitude is generally below the rotor swept area. LSE can be excluded for this feature.

The foraging range of great black-backed gull likewise does not reach the Array Area. This species may be present in the non-breeding season; however, the population at that season will incorporate birds from a wide variety of sources. The DAS for the Project also recorded a low abundance of this species. Therefore, LSE can be confidently ruled out.

d Changes to Prey Availability

The presence of the Project does not have potential to impact the foraging of all qualifying features with limited effects predicted on prey species and the project being sited away from core foraging areas. LSE can be excluded.

e In-combination effects

Given that effect pathways to LSE exists for kittiwake, the potential for in-combination effects with other plans and projects remains. The exceptions in this regard are great black-backed gull, guillemot and fulmar, for which effect pathways have not been identified and therefore there is no potential for contribution to in-combination effects.

3.11 North Caithness Cliffs

Table 3-11: LSE Matrix for marine ornithological features of North Caithness Cliffs SPA

Distance from Project							**142 km from ECC; 299 km from Array Area**								
Feature	**Vessel disturbance**			**Distributional responses**			**Collision risk**			**Changes in prey availability and behaviour**			**In-combination effects**		
	C	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**
Kittiwake (breeding)	Xa	Xa	Xa		✓b			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Guillemot (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Razorbill (breeding)	Xa	Xa	Xa		✓b			Xc		Xd	Xd	Xd	Xe	✓e	Xe
Puffin (breeding)	✓a	✓a	✓a		✓b			Xc		Xd	Xd	Xd	✓e	✓e	✓e
Fulmar (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Seabird assemblage (breeding)*	✓a	✓a	✓a		✓b			✓c		Xd	Xd	Xd	✓e	✓e	✓e

*** Note that where one of the above potential pathways to LSE exist for a component feature, by definition it also exists for the wider qualifying breeding seabird assemblage.**

a Vessel Disturbance

Kittiwake and fulmar are not considered to be highly sensitive to disturbance[24]. Considering that disturbance effects from vessels are likely be localised and temporary, LSE can be excluded.

Puffin foraging range does not extend to the Array Area but do so to the ECC. While likely to be localised and temporary, there may be temporary disturbance effects from vessel activities. LSE cannot be excluded.

Guillemot and razorbill foraging range does not reach either the ECC or Array Area. LSE can be excluded.

b Distributional Responses

During the operation and maintenance phase, kittiwake foraging range may extend to the Array Area during the breeding and non-breeding seasons, hence populations may be affected by displacement or barrier effects from the presence of WTGs and regular maintenance activity with the Project. LSE cannot be excluded for these features at any time of the year during this phase of the Project.

Razorbill and puffin foraging ranges do not extend to the Array Area but do to the ECC. These features' populations may be affected by disturbance/displacement during construction. LSE can therefore not be excluded for these features at any time of year.

Fulmar is not sensitive to distributional responses and LSE can be excluded. Guillemot foraging range does not reach the Array Area. LSE can be excluded.

c Collision Risk

There is potential for collision with WTGs for kittiwake, given that this feature may forage within the Array Area and may fly within the 'at risk' height range within the rotor swept area during both the breeding and non-breeding seasons. LSE therefore cannot be excluded for this feature at any time of the year.

While fulmar may also forage within the Array Area during the breeding and non-breeding seasons, fulmar generally fly below the rotor swept area and therefore are unlikely to be impacted. Razorbill and puffin also typically fly below collision height. LSE can be excluded for these features at all times of the year. Guillemot foraging range does not reach the Array Area. LSE can be excluded.

d Changes to Prey Availability

The presence of the Project does not have potential to impact the foraging of all qualifying features with limited effects predicted on prey species and the Project being sited away from core foraging areas. LSE can be excluded.

e In-combination Effects

Given that effect pathway to LSE exists for kittiwake, puffin and razorbill, the potential for in-combination effects with other plans and projects remains. The exceptions in this regard are guillemot and fulmar, for which effect pathways have not been identified and, therefore, there is no potential for contribution to in-combination effects.

3.12 Fair Isle SPA

Table 3-12: LSE Matrix for marine ornithological features of Fair Isle SPA

Distance from Project							212 km from ECC; 303 km from Array Area								
Feature	**Vessel disturbance**			**Distributional responses**			**Collision risk**			**Changes in prey availability and behaviour**			**In-combination effects**		
	C	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**
Kittiwake (breeding)	Xa	Xa	Xa		✓b			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Arctic tern (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Puffin (breeding)	✓a	✓a	✓a		✓b			Xc		Xd	Xd	Xd	✓e	✓e	✓e
Arctic skua (breeding)	Xa	Xa	Xa		Xb			Xb		Xd	Xd	Xd	Xe	Xe	Xe
Great skua (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Gannet (breeding)	Xa	Xa	Xa		✓b			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Guillemot (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Razorbill (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Fulmar (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Shag (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Seabird assemblage (breeding)*	✓a	✓a	✓a		✓b			✓c		Xd	Xd	Xd	✓e	✓e	✓e

*** Note that where one of the above potential pathways to LSE exist for a component feature, by definition it also exists for the wider qualifying breeding seabird assemblage.**

a Vessel Disturbance

Kittiwake, gannet, fulmar and great skua are not considered to be highly sensitive to disturbance[24.] Considering that disturbance effects from vessels are likely be localised and temporary, LSE can be excluded.

Puffin foraging range does not extend to the Array Area but does so to the ECC. In addition, while likely to be localised and temporary, there may be temporary disturbance and displacement effects during the construction of the Project in the ECC and, in the non-breeding season only, the Array Area. Puffin are moderately sensitive disturbance and LSE cannot be excluded.

The ECC and Array Area are outside of foraging range for all other species. While certain species may occur in the non-breeding season, considering the temporary nature of the impact, LSE can be excluded.

b Distributional Responses

During the operation and maintenance phase, kittiwake foraging range does not extend to the Array Area during the breeding season. Components of the SPA population may be present in the non-breeding season however; hence populations may be affected by displacement or barrier effects from the presence of WTGs and regular maintenance activity with the Project. LSE cannot be excluded for these features during this phase of the Project.

Puffin foraging range does not extend to the Array Area but does so to the ECC. In addition, while likely to be localised and temporary, there may be temporary disturbance and displacement effects during the construction of the Project in the ECC and, in the non-breeding season only, the Array Area. Puffin are moderately sensitive to disturbance and LSE cannot be excluded.

Foraging range of gannet extends to the Array Area during the breeding season; hence populations may be affected by distributional responses. LSE cannot therefore be excluded.

Fulmar and great skua are not considered to be sensitive to disturbance[24]. Considering that disturbance effects from vessel are likely be localised and temporary, LSE can be excluded.

The foraging range of all other qualifying features does not reach the Array Area. LSE can be excluded.

c Collision Risk

There is potential for collision with WTGs for kittiwake and gannet, given that these features may forage within the Array Area and may fly within the ‘at risk’ height range within the rotor swept area during the breeding and non-breeding seasons. LSE therefore cannot be excluded for these features at any time of the year.

While fulmar may also forage within the Array Area during the breeding and non-breeding seasons, these features generally fly below the rotor swept area and therefore are unlikely to be affected. LSE can be excluded for these features at all times of the year.

While great skua from this SPA are within foraging range of the Array Area, only two individuals were recorded in the DAS (and one within the Array Area). LSE can therefore be excluded.

All other qualifying features foraging range does not reach the Array Area and LSE can be excluded.

d Changes to Prey Availability

The presence of the Project does not have potential to impact the foraging of all qualifying features with limited effects predicted on prey species and the Project being sited away from core foraging areas. LSE can be excluded.

e In-combination Effects

Given that effect pathways to LSE exists for gannet, kittiwake and puffin, the potential for in-combination effects with other plans and projects remains. For all other qualifying features effect pathways leading to LSE have not been identified and therefore there is no potential for contribution to in-combination effects.

3.13 Hoy SPA

Table 3-13: LSE Matrix for marine ornithological features of Hoy SPA

Distance from Project							167 km from ECC; 321 km from Array Area								
Feature	Vessel disturbance			Distributional responses			Collision risk			Changes in prey availability and behaviour			In-combination effects		
	C	OM	D	C	OM	D	C	OM	D	C	OM	D	C	OM	D
Kittiwake (breeding)	Xa	Xa	Xa		✓b			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Great black-backed gull (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Guillemot (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Razorbill (breeding)	Xa	Xa	Xa		✓b			Xc		Xd	Xd	Xd	Xe	✓e	Xe
Puffin (breeding)	✓a	✓a	✓a		✓b			Xc		Xd	Xd	Xd	✓e	✓e	✓e
Fulmar (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Red-throated diver (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Arctic skua (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Great skua (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Seabird assemblage (breeding)*	✓a	✓a	✓a		✓b			✓c		Xd	Xd	Xd	✓e	✓e	✓e

*** Note that where one of the above potential pathways to LSE exist for a component feature, by definition it also exists for the wider qualifying breeding seabird assemblage.**

a Vessel Disturbance

Kittiwake foraging range does not extend to either the Array Area or the ECC in the breeding season. While kittiwake from this SPA may pass through the Project Area in the non-breeding season impacts will be localised and temporary. Kittiwake is also not considered to be highly sensitive to disturbance[24]. LSE can therefore be excluded.

The foraging range of great black-backed gull shows that there will be no connectivity with the Array Area. While great black-backed gull may be present in the ECC, the alternative habitat available and the low sensitivity to disturbance means that LSE can be excluded.

Razorbill foraging range does not extend to the Array Area or the ECC in the breeding season. While razorbill from this SPA may interact with the Array Area in the non-breeding season impacts are likely to be localised and temporary, and with a considerable area of alternative habitat available, LSE can be excluded.

Puffin foraging range does not extend to the Array Area but does so to the ECC. While likely to be localised and temporary, there may be temporary disturbance and displacement effects during the construction of the Project. Puffin are moderately sensitive disturbance and LSE cannot be excluded.

Fulmar and great skua are not considered to be sensitive to disturbance[24]. Considering that disturbance effects from vessel are likely be localised and temporary, LSE can be excluded.

Arctic skua and red-throated diver are not in foraging range of the ECC or Array Area. Both species were unrecorded on DAS so that LSE can be excluded at any time of year.

b Distributional Responses

Kittiwake foraging range does not extend to either the Array Area or the ECC in the breeding season. Components of the SPA population may be present in the non-breeding season however; hence populations may be affected by displacement or barrier effects from the presence of WTGs and regular maintenance activity with the Project. LSE cannot be excluded.

Great black-backed gull, Arctic skua and red-throated diver foraging range does not extend to the Array Area. All of these species were either unrecorded on DAS or present in low densities so that LSE can be excluded at any time of year.

Razorbill, and puffin foraging range does not extend to the Array Area in the breeding season but components of the SPA population may be present in the non-breeding season. These species are moderately sensitive to distributional responses and LSE cannot therefore be excluded.

While fulmar may forage within the Array Area, this species has a particularly large foraging range and therefore has extensive alternative marine habitats available. Fulmar is not highly vulnerable to distributional responses. LSE can therefore be excluded.

c Collision Risk

Kittiwake foraging range does not extend to the Array Area from this SPA in the breeding season. Kittiwake may however pass through the Array Area in the non-breeding season however; LSE cannot therefore be excluded.

Great black-backed gull, Arctic skua and red-throated diver foraging range does not extend to the Array Area. All of these species were either unrecorded on DAS or present in low densities so that LSE can be excluded at any time of year. While great skua from this SPA are within foraging range of the Array Area, only two individuals were recorded in the DAS (and one within the Array Areas). LSE can therefore be excluded.

Razorbill, guillemot, puffin and fulmar are not vulnerable to collision events as they fly below the rotor swept area. In any case, the foraging range of Razorbill, guillemot and puffin is such that there is no connectivity with the Array Area. LSE can be excluded.

d Changes to Prey Availability

The presence of the Project does not have potential to impact the foraging of all qualifying features with limited effects predicted on prey species and the Project being sited away from core foraging areas. LSE can be excluded.

e In-combination Effects

Given that effect pathways to LSE exists for kittiwake, razorbill and puffin, the potential for in-combination effects with other plans and projects remains. The exception in this regard is great black-backed gull, guillemot, red-throated diver, Arctic skua, great skua and fulmar, for which effect pathways have not been identified and therefore there is no potential for contribution to in-combination effects.

3.14 Calf of Eday SPA

Table 3-14: LSE Matrix for marine ornithological features of Calf of Eday SPA

Distance from Project							195 km from ECC; 324 km from Array Area								
Feature	Vessel disturbance			Distributional responses			Collision risk			Changes in prey availability and behaviour			In-combination effects		
	C	OM	D	C	OM	D	C	OM	D	C	OM	D	C	OM	D
Kittiwake (breeding)	Xa	Xa	Xa		✓b			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Great black-backed gull (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Cormorant (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Guillemot (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Fulmar (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Seabird assemblage (breeding)	Xa	Xa	Xa		✓b			✓c		Xd	Xd	Xd	Xe	✓e	Xe

*** Note that where one of the above potential pathways to LSE exist for a component feature, by definition it also exists for the wider qualifying breeding seabird assemblage.**

a Vessel Disturbance

Kittiwake and fulmar are not considered to be highly sensitive to disturbance[24.] Considering that disturbance effects from vessels are likely be localised and temporary, LSE can be excluded.

The ECC and Array Area are not in foraging range of guillemot, cormorant and great black-backed gull from this SPA. Considering the temporary nature of impacts and the availability of alternative habitat, LSE can therefore be excluded at all times of the year.

b Distributional Responses

During the operation and maintenance phase, kittiwake foraging range does not extend to the Array Area during the breeding season. Components of the SPA population may be present in the non-breeding season however; hence populations may be affected by displacement or barrier effects from the presence of WTGs and regular maintenance activity with the Project. LSE cannot be excluded for these features during this phase of the Project.

Guillemot foraging range does not extend to the Array Area in the breeding season. It is considered unlikely that components of the SPA population may be present in the non-breeding season and therefore LSE is excluded at all times of year.

The Array Area are not in foraging range of cormorant and great black-backed gull from this SPA. These species were either unrecorded or present in low densities during DAS so that LSE can be excluded at all times of year.

c Collision Risk

Kittiwake foraging range does not extend to the Array Area from this SPA in the breeding season. Kittiwake may however pass through the Array Area in the non-breeding season however; LSE cannot therefore be excluded.

Great black-backed gull, cormorant and guillemot foraging range does not extend to the Array Area. All of these species were either unrecorded on DAS or present in low densities so that LSE can be excluded at any time of year.

Fulmar are not vulnerable to collision events as they fly below the rotor swept area. LSE can be excluded.

d Changes to Prey Availability

The presence of the Project does not have potential to impact the foraging of all qualifying features with limited effects predicted on prey species and the Project being sited away from core foraging areas. LSE can be excluded.

e In-combination Effects

Given that at least one effect pathway to LSE exists for kittiwake, the potential for in-combination effects with other plans and projects remains. For fulmar, great black-backed gull, guillemot and cormorant, effect pathways leading to LSE have not been identified and therefore there is no potential for contribution to in-combination effects.

3.15 Sumburgh Head SPA

Table 3-15: LSE Matrix for marine ornithological features of Sumburgh Head SPA

Distance from Project							250 km from ECC; 326 km from Array Area								
Feature	**Vessel disturbance**			**Distributional responses**			**Collision risk**			**Changes in prey availability and behaviour**			**In-combination effects**		
	C	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**
Arctic tern (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Kittiwake (breeding)	Xa	Xa	Xa		✓b			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Guillemot (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Fulmar (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Seabird assemblage (breeding)	Xa	Xa	Xa		✓b			✓c		Xd	Xd	Xd	Xe	✓e	Xe

*** Note that where one of the above potential pathways to LSE exist for a component feature, by definition it also exists for the wider qualifying breeding seabird assemblage.**

a Vessel Disturbance

Kittiwake are not considered to be highly sensitive to disturbance[24]. Considering that disturbance effects from vessels are likely be localised and temporary, LSE can be excluded.

Fulmar are not considered to be sensitive to disturbance[24]. Considering that disturbance effects from vessel are likely be localised and temporary, LSE can be excluded.

The ECC and Array Area are not in foraging range of guillemot, or Arctic tern from this SPA. Considering the temporary nature of impacts and the availability of alternative habitat, LSE can therefore be excluded at all times of the year.

b Distributional Responses

During the operation and maintenance phase, kittiwake foraging range does not extend to the Array Area during the breeding season. Components of the SPA population may be present in the non-breeding season however; hence populations may be affected by displacement or barrier effects from the presence of WTGs and maintenance activity associated with the Project. LSE cannot be excluded for these features during the operations and maintenance phase of the Project.

While fulmar may forage within the Array Area, this species has a particularly large foraging range and therefore has extensive alternative marine habitats available. Fulmar is not highly vulnerable to distributional responses. LSE can therefore be excluded.

Guillemot and Arctic tern foraging range does not extend to the Array Area in the breeding season. It is considered unlikely that components of the SPA population may be present in the non-breeding season and therefore LSE is excluded at all times of year.

c Collision Risk

Kittiwake foraging range does not extend to the Array Area from this SPA in the breeding season. Kittiwake from this SPA may pass through the Array Area in the non-breeding season however; LSE cannot therefore be excluded.

Fulmar is not vulnerable to collision effects as a high proportion of birds fly below the rotor swept area. LSE can therefore be excluded.

Guillemot and Arctic tern foraging range does not extend to the Array Area in the breeding season. It is considered unlikely that components of the SPA population may be present in the non-breeding season and therefore LSE is excluded at all times of year.

d Changes to Prey Availability and Behaviour

The presence of the Project does not have potential to impact the foraging of all qualifying features with limited effects predicted on prey species and the Project being sited away from core foraging areas. LSE can be excluded.

e In-combination Effects

Given that an effect pathway to LSE exists for kittiwake, the potential for in-combination effects with other plans and projects remains. For fulmar, guillemot and Arctic tern, effect pathways leading to LSE have not been identified and therefore there is no potential for contribution to in-combination effects.

3.16 Flamborough & Filey Coast SPA

Table 3-16: LSE Matrix for marine ornithological features of Flamborough & Filey Coast SPA

Distance from Project							345 km from ECC; 325 km from Array Area								
Feature	Vessel disturbance			Distributional responses			Collision risk			Changes in prey availability and behaviour			In-combination effects		
	C	OM	D	C	OM	D	C	OM	D	C	OM	D	C	OM	D
Gannet (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Kittiwake (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Guillemot (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Razorbill (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Seabird assemblage (breeding)*	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe

*** Note that where one of the above potential pathways to LSE exist for a component feature, by definition it also exists for the wider qualifying breeding seabird assemblage.**

a Vessel Disturbance

The published foraging range of gannet extends to the Array Area and ECC. Tracking studies of gannet in the UK have shown clear space partitioning of at sea foraging seas. Individuals tracked from this SPA do not closely interact with the Project. LSE can therefore be excluded.

The ECC and Array Area are not in foraging range of kittiwake, guillemot or razorbill from this SPA. Considering the temporary nature of impacts and the availability of alternative habitat, LSE can therefore be excluded at all times of the year.

b Distributional Responses

The published foraging range of gannet extends to the Array Area. Tracking studies of gannet in the UK have shown clear space partitioning of at sea foraging seas. Individuals tracked from this SPA do not closely interact with the Project. LSE can therefore be excluded.

Kittiwake, guillemot or razorbill foraging range does not extend to the Array Area in the breeding season. It is considered unlikely that components of the SPA population may be present in the non-breeding season and therefore LSE is excluded at all times of year.

c Collision Risk

The published foraging range of gannet extends to the Array Area. Tracking studies of gannet in the UK have shown clear space partitioning of at sea foraging seas. Individuals tracked from this SPA do not closely interact with the Project. LSE can therefore be excluded.

Kittiwake, guillemot or razorbill foraging range does not extend to the Array Area in the breeding season. It is considered unlikely that components of the SPA population may be present in the non-breeding season and therefore LSE is excluded at all times of year.

d Changes to Prey Availability and Behaviour

The presence of the Project does not have potential to impact the foraging of all qualifying features with limited effects predicted on prey species and the Project being sited away from core foraging areas. LSE can be excluded.

e In-combination Effects

No effect pathway to LSE exists for features of the SPA, therefore, the potential for in-combination effects with other plans and projects can be excluded.

3.17 Rousay SPA

Table 3-17: LSE Matrix for marine ornithological features of Rousay SPA

Distance from Project								197 km from ECC; 332 km from Array Area							
Feature	**Vessel disturbance**			**Distributional responses**			**Collision risk**			**Changes in prey availability and behaviour**			**In-combination effects**		
	C	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**
Kittiwake (breeding)	Xa	Xa	Xa		✓b			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Arctic tern (breeding)	Xa	Xa	Xa		Xa			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Arctic Skua (breeding)	Xa	Xa	Xa		Xa			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Guillemot (breeding)	Xa	Xa	Xa		Xa			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Fulmar (breeding)	Xa	Xa	Xa		Xa			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Seabird assemblage (breeding)*	Xa	Xa	Xa		✓b			✓c		Xd	Xd	Xd	Xe	✓e	Xe

*** Note that where one of the above potential pathways to LSE exist for a component feature, by definition it also exists for the wider qualifying breeding seabird assemblage.**

a Vessel Disturbance

Kittiwake are not considered to be highly sensitive to disturbance[24.] Considering that disturbance effects from vessels are likely be localised and temporary, LSE can be excluded.

Fulmar are not considered to be sensitive to disturbance[24P.] Considering that disturbance effects from vessel are likely be localised and temporary, LSE can be excluded.

The ECC and Array Area are not in foraging range for either Arctic tern, Arctic skua or guillemot. Arctic skua and Arctic tern were not recording in the DAS so that LSE can be confidently excluded at all times of year. It is considered unlikely that guillemot from this SPA will occur at the Project in the non-breeding season. LSE can therefore also be excluded.

b Distributional Response

During the operation and maintenance phase, kittiwake foraging range does not extend to the Array Area during the breeding season. Components of the SPA population may be present in the non-breeding season however; hence populations may be affected by disturbance/displacement or barrier effects from the presence of WTGs and regular maintenance activity with the Project. LSE cannot be excluded for these features during this phase of the Project.

While fulmar may forage within the Array Area, this species has a particularly large foraging range and therefore has extensive alternative marine habitats available. Fulmar is not highly vulnerable to distributional responses. LSE can therefore be excluded.

The Array Area are not in foraging range for either Arctic tern, Arctic skua or guillemot. Arctic skua and Arctic tern were not recording in the DAS so that LSE can be confidently excluded at all times of year. It is considered unlikely that guillemot from this SPA will occur at the Array Area in the non-breeding season. LSE can therefore also be excluded.

c Collision Risk

Kittiwake foraging range does not extend to the Array Area from this SPA in the breeding season. Kittiwake from this SPA may however pass through the Array Area in the non-breeding season; LSE cannot therefore be excluded.

Fulmar is not vulnerable to collision effects as a high proportion of birds fly below the rotor swept area. LSE can therefore be excluded.

The Array Area are not in foraging range for either Arctic tern, Arctic skua or guillemot. Arctic skua and Arctic tern were not recording in the DAS so that LSE can be confidently excluded at all times of year. Guillemot in any case is not vulnerable to collision as a high proportion of birds fly below the rotor swept area. LSE can therefore also be excluded.

d Changes to Prey Availability and Behaviour

The presence of the Project does not have potential to impact the foraging of all qualifying features with limited effects predicted on prey species and the Project being sited away from core foraging areas. LSE can be excluded.

e In-combination Effects

Given that effect pathways to LSE exists kittiwake, the potential for in-combination effects with other plans and projects remains. For all other qualifying features effect pathways leading to LSE have not been identified and therefore there is no potential for contribution to in-combination effects.

3.18 West Westray SPA

Table 3-18: LSE Matrix for marine ornithological features of West Westray SPA

Distance from Project								207 km from ECC; 341 km from Array Area							
Feature	Vessel disturbance			Distributional responses			Collision risk			Changes in prey availability and behaviour			In-combination effects		
	C	OM	D	C	OM	D	C	OM	D	C	OM	D	C	OM	D
Kittiwake (breeding)	Xa	Xa	Xa		✓b			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Arctic tern (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Arctic skua (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Razorbill (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Guillemot (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Fulmar (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Seabird assemblage (breeding)*	Xa	Xa	Xa		✓b			✓c		Xd	Xd	Xd	Xe	✓e	Xe

*** Note that where one of the above potential pathways to LSE exist for a component feature, by definition it also exists for the wider qualifying breeding seabird assemblage.**

a Vessel Disturbance

Kittiwake are not considered to be sensitive to disturbance[24]. Considering that disturbance effects from vessels are likely be localised and temporary, LSE can be excluded.

Fulmar are not considered to be sensitive to disturbance[24]. Considering that disturbance effects from vessel are likely be localised and temporary, LSE can be excluded.

The ECC and Array Area are not in foraging range for either Arctic tern, Arctic skua, razorbill or guillemot. Arctic skua and Arctic tern were not recording in the DAS so that LSE can be confidently excluded at all times of year. It is considered unlikely that razorbill or guillemot from this SPA will occur at the Project in the non-breeding season. LSE can therefore also be excluded.

b Distributional Response

During the operation and maintenance phase, kittiwake foraging range does not extend to the Array Area during the breeding season. Components of the SPA population may be present in the non-breeding season however; hence populations may be affected by disturbance/displacement or barrier effects from the presence of WTGs and regular maintenance activity with the Project. LSE cannot be excluded for these features during this phase of the Project.

While fulmar may forage within the Array Area, this species has a particularly large foraging range and therefore has extensive alternative marine habitats available. Fulmar is not highly vulnerable to distributional responses. LSE can therefore be excluded.

The Array Area are not in foraging range for either Arctic tern, Arctic skua, razorbill or guillemot. Arctic skua and Arctic tern were not recording in the DAS so that LSE can be confidently excluded at all times of year. It is considered unlikely that guillemot from this SPA will occur at the Array Area in the non-breeding season. LSE can therefore also be excluded.

c Collision Risk

Kittiwake foraging range does not extend to the Array Area from this SPA in the breeding season. Kittiwake from this SPA may however pass through the Array Area in the non-breeding season; LSE cannot therefore be excluded.

Fulmar is not vulnerable to collision effects as a high proportion of birds fly below the rotor swept area. LSE can therefore be excluded.

The Array Area are not in foraging range for either Arctic tern, Arctic Skua, razorbill or guillemot. Arctic Skua and Arctic tern were not recording in the DAS so that LSE can be confidently excluded at all times of year. Guillemot and razorbill are in any case is no vulnerable to collision as a high proportion of birds fly below the rotor swept area. LSE can therefore also be excluded.

d Changes to Prey Availability and Behaviour

The presence of the Project does not have potential to impact the foraging of all qualifying features with limited effects predicted on prey species and the Project being sited away from core foraging areas. LSE can be excluded.

e In-combination Effects

Given that effect pathways to LSE exists kittiwake, the potential for in-combination effects with other plans and projects remains. For all other qualifying features effect pathways leading to LSE have not been identified and therefore there is no potential for contribution to in-combination effects.

3.19 Marwick Head SPA

Table 3-19: LSE Matrix for marine ornithological features of Marwick Head SPA

Distance from Project				201 km from ECC; 346 km from Array Area											
Feature	**Vessel disturbance**			**Distributional responses**			**Collision risk**			**Changes in prey availability and behaviour**			**In-combination effects**		
	C	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**
Kittiwake (breeding)	Xa	Xa	Xa		✓b			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Guillemot (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Seabird assemblage (breeding)*	Xa	Xa	Xa		✓b			✓c		Xd	Xd	Xd	Xe	✓e	Xe

*** Note that where one of the above potential pathways to LSE exist for a component feature, by definition it also exists for the wider qualifying breeding seabird assemblage.**

a Vessel Disturbance

Kittiwake are not considered to be highly sensitive to disturbance[24]. Considering that disturbance effects from vessels are likely be localised and temporary, LSE can be excluded.

Guillemot foraging range does not extend to the Array Area or the ECC in the breeding season. It is not expected that guillemot from this SPA may interact with the Project in the non-breeding season and in any case impacts from vessel activities are likely to be localised and temporary, and with a considerable area of alternative habitat available, LSE can be excluded.

b Distributional Response

During the operation and maintenance phase, kittiwake foraging range does not extend to the Array Area during the breeding season. Components of the SPA population may be present in the non-breeding season however; hence populations may be affected by disturbance/displacement or barrier effects from the presence of WTGs and regular maintenance activity with the Project. LSE cannot be excluded for these features during this phase of the Project.

c Guillemot foraging range does not extend to the Array Area in the breeding season. It is considered unlikely that components of the SPA population will be present in the non-breeding season. LSE cannot therefore be excluded. Collision Risk

Kittiwake foraging range does not extend to the Array Area from this SPA in the breeding season. Kittiwake from this SPA may however pass through the Array Area in the non-breeding season. LSE cannot therefore be excluded.

Guillemot are not vulnerable to collision events as they fly below the rotor swept area[25] [26] [24]. In any case, the foraging range of guillemot is such that there is no connectivity with the Array Area in the breeding season. LSE can therefore be excluded.

d Changes to prey availability and behaviour

The presence of the Project does not have potential to impact the foraging of all qualifying features with limited effects predicted on prey species and the Project being sited away from core foraging areas. LSE can be excluded.

e In-combination effects

Given that an effect pathway to LSE exists for kittiwake, the potential for in-combination effects with other plans and projects remains. For guillemot effect pathways leading to LSE have not been identified and therefore there is no potential for contribution to in-combination effects.

3.20 Foula SPA

Table 3-20: LSE Matrix for marine ornithological features of Foula SPA

Distance from Project							281 km from ECC; 373 km from Array Area								
Feature	Vessel disturbance			Distributional responses			Collision risk			Changes in prey availability and behaviour			In-combination effects		
	C	OM	D	C	OM	D	C	OM	D	C	OM	D	C	OM	D
Leach's storm-petrel (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Red-throated diver (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Shag (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Arctic tern (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Kittiwake (breeding)	Xa	Xa	Xa		✓b			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Great skua (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Arctic skua (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Fulmar (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Razorbill (breeding)	Xa	Xa	Xa		✓b			Xc		Xd	Xd	Xd	Xe	✓e	Xe
Guillemot (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Puffin (breeding)	Xa	Xa	Xa		✓b			Xc		Xd	Xd	Xd	Xe	✓e	Xe
Shag (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Seabird assemblage*	Xa	Xa	Xa		✓b			✓c		Xd	Xd	Xd	Xe	✓e	Xe

*** Note that where one of the above potential pathways to LSE exist for a component feature, by definition it also exists for the wider qualifying breeding seabird assemblage.**

a Vessel Disturbance

Kittiwake are not considered to be highly sensitive to disturbance[24]. Considering that disturbance effects from vessels are likely be localised and temporary, LSE can be excluded.

The breeding season foraging range of red-throated diver does not approach the Array Area or ECC from this SPA. There is also considered to be no prospect of interaction with the Project in the non-breeding season. LSE can be excluded.

Great skua are not considered to be highly sensitive to disturbance. Considering that disturbance effects from vessel are likely be localised and temporary, LSE can be excluded.

Fulmar and Leach's storm petrel are not considered to be sensitive to disturbance[24]. Considering that disturbance effects from vessel are likely be localised and temporary, LSE can be excluded

Razorbill and puffin foraging range does not extend to the Array Area or the ECC in the breeding season. While razorbill from this SPA may interact with the Project in the non-breeding season this is expected to be very limited in extent. Impacts from vessel activities are likely to be localised and temporary, and with a considerable area of alternative habitat available, LSE can be excluded.

Guillemot, Arctic tern and shag foraging range does not extend to the Array Area or the ECC in the breeding season. Guillemot foraging range does not extend to the Array Area or the ECC in the breeding season. It is not expected that these species interact with the Project in the non-breeding season and in any case impacts from vessel activities are likely to be localised and temporary, and with a considerable area of alternative habitat available, LSE can be excluded.

b Distributional Responses

During the operation and maintenance phase, kittiwake foraging range does not extend to the Array Area during the breeding season. Components of the SPA population may be present in the non-breeding season however; hence populations may be affected by disturbance/displacement or barrier effects from the presence of WTGs and regular maintenance activity with the Project. LSE cannot be excluded for these features during this phase of the Project.

The breeding season foraging range of red-throated diver does not approach the Array Area or ECC from this SPA. There is also considered to be no prospect of interaction with the Project in the non-breeding season. LSE can be excluded.

While fulmar and great skua may also forage within the Array Area, these features have particularly large foraging ranges, and therefore have extensive alternative marine habitats available for foraging/roosting in case of disturbance/displacement. LSE can be excluded for these features at all times of the year.

Razorbill and puffin foraging range does not extend to the Array Area in the breeding season, but limited components of the SPA population may be present in the non-breeding season. Razorbill and puffin may be sensitive to displacement effects during this period and LSE cannot therefore be excluded.

The Array Area is not in foraging range for any other qualifying feature. Arctic Skua, Leach's storm petrel, shag and Arctic tern were not recorded in the DAS so that LSE can be confidently excluded at all times of year. It is considered unlikely that guillemot from this SPA will occur at the Array Area in the non-breeding season. LSE can therefore also be excluded.

c Collision Risk

Kittiwake foraging range does not extend to the Array Area from this SPA in the breeding season. Kittiwake from this SPA may however pass through the Array Area in the non-breeding season; LSE cannot therefore be excluded.

The breeding season foraging range of red-throated diver does not approach the Array Area or ECC from this SPA. There is also considered to be no prospect of interaction with the Project in the non-breeding season. LSE can be excluded.

While great skua from this SPA are within foraging range of the Array Area, only two individuals were recorded in the DAS (and one within the Array Area). LSE can therefore be excluded.

Fulmar is not vulnerable to collision effects as a high proportion of birds fly below the rotor swept area. LSE can therefore be excluded.

The Array Area is not in foraging range for any other qualifying feature. Arctic skua, Leach's storm petrel, shag and Arctic tern were not recording in the DAS so that LSE can be confidently excluded at all times of year. Guillemot, puffin, or razorbill are not vulnerable to collision. Therefore, LSE can also be excluded.

d Changes to Prey Availability and Behaviour

The presence of the Project does not have potential to impact the foraging of all qualifying features with limited effects predicted on prey species and the Project being sited away from core foraging areas. LSE can be excluded.

e In-combination Effects

Given that an effect pathway to LSE exists for kittiwake, puffin and razorbill the potential for in-combination effects with other plans and projects remains. For all other qualifying features effect pathways leading to LSE have not been identified and therefore there is no potential for contribution to in-combination effects.

3.21 Fetlar SPA

Table 3-21: LSE Matrix for marine ornithological features of Fetlar SPA

Distance from Project							330 km from ECC; 387 km from Array Area								
Feature	**Vessel disturbance**			**Distributional responses**			**Collision risk**			**Changes in prey availability and behaviour**			**In-combination effects**		
	C	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**
Arctic tern (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Fulmar (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Arctic skua (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Great skua (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Seabird assemblage (breeding)*	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe

*** Note that where one of the above potential pathways to LSE exist for a component feature, by definition it also exists for the wider qualifying breeding seabird assemblage.**

a Vessel Disturbance

Fulmar, great skua and Arctic skua are not considered to be highly sensitive to disturbance[31]. Considering that disturbance effects from vessel are likely be localised and temporary, LSE can be excluded.

The ECC or Array Area are not within foraging range of Arctic tern. No connectivity with birds from this SPA and the Project is considered likely in any season. LSE can be excluded.

b Distributional Responses

While great skua is within foraging range of the Array Area, this species has a particularly large foraging range and therefore has extensive alternative marine habitats available for foraging. LSE can be excluded.

The Array Area is not within foraging range of Arctic skua. This species was in any case recorded in very low numbers in DAS (two individuals) and are not sensitive to distributional responses. LSE can be excluded.

The Array Area are not within foraging range of Arctic tern. No connectivity with birds from this SPA and the Project is considered likely in any season. LSE can be excluded.

While fulmar may forage within the Array Area, this species has a particularly large foraging range and therefore has extensive alternative marine habitats available. Fulmar is not highly vulnerable to distributional responses. LSE can therefore be excluded.

c Collision Risk

While great skua from this SPA are within foraging range of the Array Area, only two individuals were recorded in the DAS (and one within the Array Area). LSE can therefore be excluded.

The Array Area is not within foraging range of Arctic skua. This species was in any case recorded in very low numbers in DAS (two individuals) and are not sensitive to distributional responses. LSE can be excluded.

The Array Area are not within foraging range of Arctic tern. No connectivity with birds from this SPA and the Project is considered likely in any season. LSE can be excluded.

Fulmar is not vulnerable to collision effects as a high proportion of birds fly below the rotor swept area. LSE can therefore be excluded.

d Changes to Prey Availability and Behaviour

The presence of the Project does not have potential to impact the foraging of all qualifying features with limited effects predicted on prey species and the Project being sited away from core foraging areas. LSE can be excluded.

e In-combination Effects

No effect pathway to LSE exists for features of the SPA, the potential for in-combination effects with other plans and projects can be excluded.

3.22 Cape Wrath SPA

Table 3-22: LSE Matrix for marine ornithological features of Cape Wrath SPA

Distance from Project							218 km from ECC; 395 km from Array Area								
Feature	**Vessel disturbance**			**Distributional responses**			**Collision risk**			**Changes in prey availability and behaviour**			**In-combination effects**		
	C	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**
Kittiwake (breeding)	Xa	Xa	Xa		✓b			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Guillemot (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Razorbill (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Puffin (breeding)	✓a	✓a	✓a		✓b			Xc		Xd	Xd	Xd	✓e	✓e	✓e
Fulmar (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Seabird assemblage*	✓a	✓a	✓a		✓b			✓c		Xd	Xd	Xd	✓e	✓e	✓e

*** Note that where one of the above potential pathways to LSE exists for a component feature, by definition it also exists for the wider qualifying breeding seabird assemblage.**

a Vessel Disturbance

Kittiwake are not considered to be highly sensitive to disturbance[31]. Considering that disturbance effects from vessels are likely be localised and temporary, LSE can be excluded.

Puffin foraging range does not extend to the Array Area but does so to the ECC In addition, puffin from this SPA may interact with the Array Area in the non-breeding season. While likely to be localised and temporary, there may be temporary disturbance effects from vessel activities. LSE cannot be excluded.

Fulmar are not considered to be sensitive to disturbance[31]. Considering that disturbance effects from vessel are likely be localised and temporary, LSE can be excluded.

The ECC and Array Area are not in foraging range for either razorbill or guillemot. It is considered unlikely that razorbill or guillemot from this SPA will occur at the Project in the non-breeding season. Considering the temporary nature of impacts and the availability of alternative habitat, LSE can therefore be excluded at all times of the year.

b Distributional Responses

During the operation and management phase, kittiwake foraging range does not extend to the Array Area during the breeding season. Components of the SPA population may be present in the non-breeding season however; hence populations may be affected by disturbance/displacement or barrier effects from the presence of WTGs and regular maintenance activity with the Project. LSE cannot be excluded for these features during this phase of the Project.

Puffin foraging range does not extend to the Array Area in the breeding season but components of the SPA population may be present in the non-breeding season. LSE therefore cannot be excluded.

The Array Area are not in foraging range for either razorbill or guillemot. It is considered unlikely that razorbill, puffin or guillemot from this SPA will occur at the Project in the non-breeding season, LSE can therefore be excluded at all times of the year.

c Collision Risk

Kittiwake foraging range does not extend to the Array Area from this SPA in the breeding season. Kittiwake from this SPA may however pass through the Array Area in the non-breeding season; LSE cannot therefore be excluded.

Puffin, razorbill and guillemot are not vulnerable to collision events as they fly below the rotor swept area. In any case, the foraging range of each species as such that there is no connectivity with the Array Area. LSE can be excluded.

Fulmar is not vulnerable to collision effects as a high proportion of birds fly below the rotor swept area. LSE can therefore be excluded.

d Changes to Prey Availability and Behaviour

The presence of the Project does not have potential to impact the foraging of all qualifying features with limited effects predicted on prey species and the Project being sited away from core foraging areas. LSE can be excluded.

e In-combination effects

Given that effect pathways to LSE exists for kittiwake and puffin, the potential for in-combination effects with other plans and projects remains. For fulmar, guillemot and razorbill, effect pathways leading to LSE have not been identified and therefore there is no potential for contribution to in-combination effects.

3.23 North Rona and Sula Sgeir SPA

Table 3-23: LSE Matrix for marine ornithological features of North Rona and Sula Sgeir SPA

Distance from Project							**297 km from ECC; 468 km from Array Area**								
Feature	**Vessel disturbance**			**Distributional responses**			**Collision risk**			**Changes in prey availability and behaviour**			**In-combination effects**		
	C	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**
European Storm-petrel (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Leach's storm-petrel (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Gannet (breeding)	Xa	Xa	Xa		✓b			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Kittiwake (breeding)	Xa	Xa	Xa		✓b			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Great black-backed gull (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Guillemot (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Razorbill (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Puffin (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Fulmar (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Seabird assemblage (breeding)*	Xa	Xa	Xa		✓b			✓c		Xd	Xd	Xd	Xe	✓e	Xe

* Note that where one of the above potential pathways to LSE exists for a component feature, by definition it also exists for the wider qualifying breeding seabird assemblage.

a Vessel Disturbance

While Leach's storm petrel is in foraging range of the ECC and Array Area and European storm petrel is in foraging range of the ECC, these species were unrecorded in DAS and not expected to interact with the Project from the SPA. LSE can be excluded.

Kittiwake are not considered to be highly sensitive to disturbance[24]. Considering that disturbance effects from vessels are likely be localised and temporary, LSE can be excluded.

Foraging range of gannet extends to the Array Area and ECC. Gannet are however are not considered to be highly sensitive to disturbance. Considering that disturbance effects from vessel are likely be localised and temporary, LSE can be excluded.

Fulmar are not considered to be sensitive to disturbance[24]. Considering that disturbance effects from vessel are likely be localised and temporary, LSE can be excluded.

The ECC and Array Area are not in foraging range for either great black-backed gull, razorbill, puffin or guillemot. It is considered unlikely that razorbill or guillemot from this SPA will occur at the Project in the non-breeding season. Considering the temporary nature of impacts and the availability of alternative habitat, LSE can therefore be excluded at all times of the year.

b Distributional Responses

While Leach's storm petrel is in foraging range of the Array Area, this species was unrecorded in DAS and not expected to interact with the Project from the SPA. LSE can be excluded.

During the operation and maintenance phase, kittiwake foraging range does not extend to the Array Area during the breeding season. Components of the SPA population may be present in the non-breeding season however; hence populations may be affected by disturbance/displacement or barrier effects from the presence of WTGs and regular maintenance activity with the Project. LSE cannot be excluded for these features during this phase of the Project.

Foraging range of gannet extends to the Array Area during the breeding season; hence populations may be affected by distributional responses. Therefore, LSE cannot be excluded.

Fulmar is not vulnerable to collision effects as a high proportion of birds fly below the rotor swept area. LSE can therefore be excluded.

The Array Area are not in foraging range for either great black-backed gull, razorbill, puffin or guillemot. It is considered unlikely that razorbill, puffin or guillemot from this SPA will occur at the Project in the non-breeding season, LSE can therefore be excluded at all times of the year.

c Collision Risk

There is a potential risk for collision with WTGs with gannet and kittiwake, given that these features may forage within the Array Area and may fly within the 'at risk' height range within the rotor swept area during the breeding and non-breeding seasons. LSE therefore cannot be excluded for these features at any time of the year.

Fulmar in addition to both Leach's storm petrel and European storm petrel, are not vulnerable to collision effects as a high proportion of birds fly below the rotor swept area. LSE can therefore be excluded.

The Array Area are not in foraging range for either great black-backed gull, razorbill, puffin or guillemot. In any case razorbill, puffin or guillemot are not vulnerable to collision and LSE can therefore be excluded at all times of the year.

d Changes to Prey Availability

The presence of the Project does not have potential to impact the foraging of all qualifying features with limited effects predicted on prey species and the Project being sited away from core foraging areas. LSE can be excluded.

e In-combination Effects

Given that an effect pathway to LSE exists for kittiwake and gannet, the potential for in-combination effects with other plans and projects remains. For all other qualifying features effect pathways leading to LSE have not been identified and therefore there is no potential for contribution to in-combination effects.

3.24 Ronas Hill – North Roe and Tingon SPA

Table 3-24: LSE Matrix for marine ornithological features of Ronas Hill – North Roe and Tingon SPA

Distance from Project							325 km from ECC; 398 km from Array Area								
Feature	Vessel disturbance			Distributional responses			Collision risk			Changes in prey availability and behaviour			In-combination effects		
	C	OM	D	C	OM	D	C	OM	D	C	OM	D	C	OM	D
Great skua (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Red-throated diver	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe

a Vessel Disturbance

Great skua are not considered to be highly sensitive to disturbance[31]. Considering that disturbance effects from vessel are likely be localised and temporary, LSE can be excluded.

The breeding season foraging range of red-throated diver does not approach the Array Area or ECC from this SPA. There is also considered to be no prospect of interaction with the Project in the non-breeding season. LSE can be excluded.

b Distributional Response

While great skua is within foraging range of the Array Area, this species has a particularly large foraging range and therefore has extensive alternative marine habitats available for foraging. LSE can be excluded.

The breeding season foraging range of red-throated diver does not approach the Array Area or ECC from this SPA. There is also considered to be no prospect of interaction with the Project in the non-breeding season. LSE can be excluded.

c Collision Risk

While great skua from this SPA are within foraging range of the Array Area, only two individuals were recorded in the DAS (and one within the Array Area). LSE can therefore be excluded.

The breeding season foraging range of red-throated diver does not approach the Array Area or ECC from this SPA. There is also considered to be no prospect of interaction with the Project in the non-breeding season. LSE can be excluded.

d Changes to Prey Availability

The presence of the Project does not have potential to impact the foraging of all qualifying features with limited effects predicted on prey species and the Project being sited away from core foraging areas. LSE can be excluded.

e In-combination Effects

No effect pathway to LSE exists for feature of the SPA, so the potential for in-combination effects with other plans and projects can be excluded.

3.25 Handa SPA

Table 3-25: LSE Matrix for marine ornithological features of Handa SPA

Distance from Project															
						223 km from ECC; 407 km from Array Area									
Feature	**Vessel disturbance**			**Distributional responses**			**Collision risk**			**Changes in prey availability and behaviour**			**In-combination effects**		
	C	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**
Kittiwake (breeding)	Xa	Xa	Xa		✓b			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Great skua (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Razorbill (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Fulmar (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Guillemot (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Seabird assemblage (breeding)*	Xa	Xa	Xa		✓b			✓c		Xd	Xd	Xd	Xe	✓e	Xe

*** Note that where one of the above potential pathways to LSE exist for a component feature, by definition it also exists for the wider qualifying breeding seabird assemblage.**

a Vessel Disturbance

Kittiwake are not considered to be highly sensitive to disturbance[31]. Considering that disturbance effects from vessels are likely be localised and temporary, LSE can be excluded.

While great skua is within foraging range of the Array Area, this species has a particularly large foraging range and therefore has extensive alternative marine habitats available for foraging. LSE can be excluded.

Fulmar are not considered to be sensitive to disturbance[31]. Considering that disturbance effects from vessel are likely be localised and temporary, LSE can be excluded.

The ECC and Array Area are not in foraging range for either razorbill or guillemot. Considering the distance between the SPA and the Project areas it is considered unlikely that guillemot or razorbill from this SPA will occur at the Project in the non-breeding season. Considering the temporary nature of impacts and the availability of alternative habitat, LSE can therefore be excluded at all times of the year.

b Distributional Responses

Kittiwake foraging range does not extend to the Array Area from this SPA in the breeding season. Kittiwake from this SPA may however pass through the Array Area in the non-breeding season; LSE cannot therefore be excluded.

While great skua is within foraging range of the Array Area, this species has a particularly large foraging range and therefore has extensive alternative marine habitats available for foraging. LSE can be excluded.

While fulmar may forage within the Array Area, this species has a particularly large foraging range and therefore has extensive alternative marine habitats available. Fulmar is not highly vulnerable to distributional responses. LSE can therefore be excluded.

The Array Area is not in foraging range for either razorbill or guillemot. Considering the distance between the SPA and the Project areas it is considered unlikely that guillemot or razorbill from this SPA will occur at the Array Area in the non-breeding season. LSE can therefore be excluded at all times of the year.

c Collision Risk

Kittiwake foraging range does not extend to the Array Area from this SPA in the breeding season. Kittiwake from this SPA may however pass through the Array Area in the non-breeding season; LSE cannot therefore be excluded.

Fulmar, razorbill and guillemot are not vulnerable to collision events as they fly below the rotor swept area. In any case, the foraging range of each species s such that there is no connectivity with the Array Area. LSE can be excluded.

While great skua from this SPA are within foraging range of the Array Area, only two individuals were recorded in the DAS (and one within the Array Area). LSE can therefore be excluded.

d Changes to Prey Availability and Behaviour

The presence of the Project does not have potential to impact the foraging of all qualifying features with limited effects predicted on prey species and the Project being sited away from core foraging areas. LSE can be excluded.

e In-combination Effects

Given that an effect pathway to LSE exists for kittiwake, the potential for in-combination effects with other plans and projects remains. No effect pathways have been identified for any other qualifying features therefore there is no potential for contribution to in-combination effects.

3.26 Hermaness, Saxa Vord and Valla Field SPA

Table 3-26 LSE Matrix for marine ornithological features of Hermaness, Saxa Vord and Valla Field SPA

Distance from Project							350 km from ECC; 409 km from Array Area								
Feature	Vessel disturbance			Distributional responses			Collision risk			Changes in prey availability and behaviour			In-combination effects		
	C	OM	D	C	OM	D	C	OM	D	C	OM	D	C	OM	D
Kittiwake (breeding)	Xa	Xa	Xa		✓b			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Gannet (breeding)	Xa	Xa	Xa		✓b			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Red-throated diver (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Great skua (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Fulmar (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Shag (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	✓e	Xe
Guillemot (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	✓e	Xe
Puffin (breeding)	Xa	Xa	Xa		✓b			Xc		Xd	Xd	Xd	Xe	✓e	Xe
Seabird assemblage (breeding)*	Xa	Xa	Xa		✓b			✓c		Xd	Xd	Xd	Xe	✓e	Xe

*** Note that where one of the above potential pathways to LSE exist for a component feature, by definition it also exists for the wider qualifying breeding seabird assemblage.**

a Vessel Disturbance

Kittiwake, great skua and fulmar are not considered to be highly sensitive to disturbance[24]. Considering that disturbance effects from vessels are likely be localised and temporary, LSE can be excluded.

Foraging range of gannet extends to the Array Area and ECC. Gannet however are not considered to be highly sensitive to disturbance. Considering that disturbance effects from vessel are likely be localised and temporary, LSE can be excluded.

The breeding season foraging range of red-throated diver does not approach the Array Area or ECC from this SPA. There is also considered to be no prospect of interaction with the project in the non-breeding season. LSE can be excluded

Puffin foraging range does not extend to the Array Area or the ECC in the breeding season. While puffin from this SPA may interact with the Project in the non-breeding season this is expected to be very limited in extent. Impacts from vessel activities are likely to be localised and temporary, and with a considerable area of alternative habitat available, LSE can be excluded. Likewise, foraging range of guillemot and shag do not extend to the ECC or the Array Area. These species are not expected to interact with the Project at any time of year and LSE can be excluded.

b Distributional Response

During the operation and maintenance phase, kittiwake foraging range does not extend to the Array Area during the breeding season. Components of the SPA population may be present in the non-breeding season however; hence populations may be affected by disturbance/displacement or barrier effects from the presence of WTGs and regular maintenance activity with the Project. LSE cannot be excluded.

Foraging range of gannet extends to the Array Area during the breeding season, hence populations may be affected by distributional responses. LSE cannot therefore be excluded.

The breeding season foraging range of red-throated diver does not approach the Array Area or ECC from this SPA. There is also considered to be no prospect of interaction with the Project in the non-breeding season. LSE can be excluded.

Puffin foraging range does not extend to the Array Area in the breeding season but very limited components of the SPA population may be present in the non-breeding season. Puffin may be sensitive to displacement effects during this period and LSE cannot therefore be excluded.

While fulmar and great skua may also forage within the Array Area, these features have particularly large foraging ranges and therefore have extensive alternative marine habitats available for foraging/roosting in case of disturbance/displacement. LSE can be excluded for these features at all times of the year.

Foraging range of guillemot and shag do not extend to the Array Area. These species are not expected to interact with the Project at any time of year and LSE can be excluded.

c Collision Risk

There is potential for collision with WTGs for kittiwake and gannet, given that these features may forage within the Array Area and may fly within the ‘at risk’ height range within the rotor swept area during the breeding and/or non-breeding seasons. LSE therefore cannot be excluded for gannet at any time of the year, or for kittiwake during the non-breeding season.

The breeding season foraging range of red-throated diver does not approach the Array Area or ECC from this SPA. There is also considered to be no prospect of interaction with the Project in the non-breeding season. LSE can be excluded.

LSE can be excluded for shag and guillemot on the basis of foraging range and lack of vulnerability to collision. Similarly, puffin is not vulnerable to collision. While fulmar may forage within the Array Area during the breeding and non-breeding seasons, this feature generally flies below the rotor swept area and therefore are unlikely to be affected. LSE can be excluded for these features at all times of the year.

d Changes to Prey Availability and Behaviour

The presence of the Project does not have potential to impact the foraging of all qualifying features with limited effects predicted on prey species and the Project being sited away from core foraging areas. LSE can be excluded.

e In-combination Effects

Given that effect pathway to LSE exists for kittiwake, puffin and gannet, the potential for in-combination effects with other plans and projects remains. No effect pathways have been identified for great skua, guillemot, puffin, fulmar and shag and therefore there is no potential for contribution to in-combination effects.

3.27 Shiant Isles SPA

Table 3-27: LSE Matrix for marine ornithological features of Shiant Isles SPA

Distance from Project							273 km from ECC; 461 km from Array Area								
Feature	**Vessel disturbance**			**Distributional responses**			**Collision risk**			**Changes in prey availability and behaviour**			**In-combination effects**		
	C	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**
Kittiwake (breeding)	Xa	Xa	Xa		✓b			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Razorbill (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Puffin (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Shag (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Fulmar (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Guillemot	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Greenland barnacle goose	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Seabird assemblage (breeding)*	Xa	Xa	Xa		✓b			✓c		Xd	Xd	Xd	Xe	✓e	Xe

*** Note that where one of the above potential pathways to LSE exist for a component feature, by definition it also exists for the wider qualifying breeding seabird assemblage.**

a Vessel Disturbance

Kittiwake and fulmar are not considered to be highly sensitive to disturbance[31]. Considering that disturbance effects from vessels are likely be localised and temporary, LSE can be excluded.

Puffin, razorbill, guillemot and shag foraging range does not extend to the Array Area or the ECC in the breeding season. While there is limited potential of birds from this SPA may interact with the Project in the non-breeding season (and none for shag), this is expected to be very limited in extent. Impacts from vessel activities are likely to be localised and temporary, and with a considerable area of alternative habitat available, LSE can be excluded.

The migratory waterbird that qualifies for this SPA (Greenland barnacle goose), will not utilise habitat in the marine environment for foraging, and therefore will be unaffected by this impact. In addition, its migratory route to Greenland will not interact with the ECC or Array Area. LSE can be excluded.

b Distributional Response

During the operation and maintenance phase, kittiwake foraging range does not extend to the Array Area during the breeding season. Components of the SPA population may be present in the non-breeding season however; hence populations may be affected by disturbance/displacement or barrier effects from the presence of WTGs and regular maintenance activity with the Project. LSE cannot be excluded.

Puffin foraging range does not extend to the Array Area in the breeding season. Considering the distance to the Array Area it is considered unlikely that there will be interaction in the non-breeding season. LSE can be excluded.

While fulmar may also forage within the Array Area, this feature has a particularly large foraging ranges and therefore have extensive alternative marine habitats available for foraging/roosting in case of disturbance/displacement. LSE can be excluded for these features at all times of the year.

Foraging range of razorbill, guillemot and shag do not extend to the Array Area. These species are not expected to interact with the Project at any time of year and LSE can be excluded.

The migratory waterbird that qualifies for this SPA (Greenland barnacle goose), will not utilise habitat in the marine environment for foraging, and therefore will be unaffected by this impact. In addition, its migratory route to Greenland will not interact with the Array Area. LSE can be excluded.

c Collision Risk

Kittiwake foraging range does not extend to the Array Area from this SPA in the breeding season. Kittiwake from this SPA may however pass through the Array Area in the non-breeding season; LSE cannot therefore be excluded.

Fulmar may forage within the Array Area during the breeding and non-breeding season; however, this feature generally flies below the rotor swept area and LSE can be excluded.

Foraging range of razorbill, puffin and shag do not extend to the Array Area. These features are not in any case vulnerable to collision and LSE can be excluded.

The migratory waterbird that qualifies for this SPA (Greenland barnacle goose), will not utilise habitat in the marine environment for foraging, and therefore will be unaffected by this impact. In addition, its migratory route to Greenland will not interact with the Array Area. LSE can be excluded.

d Changes to Prey Availability and Behaviour

The presence of the Project does not have potential to impact the foraging of all qualifying features with limited effects predicted on prey species and the Project being sited away from core foraging areas. LSE can be excluded.

e In-combination Effects

Given that at least one effect pathway to LSE exists for kittiwake, the potential for in-combination effects with other plans and projects remains. For all other qualifying features, effect pathways leading to LSE have not been identified and therefore there is no potential for contribution to in-combination effects.

3.28 Sule Skerry and Sule Stack SPA

Table 3-28: LSE Matrix for marine ornithological features of Sule Skerry and Sule Stack SPA

Distance from Project															
							234 km from ECC; 394 km from Array Area								
Feature	**Vessel disturbance**			**Distributional responses**			**Collision risk**			**Changes in prey availability and behaviour**			**In-combination effects**		
	C	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**
European storm-petrel (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Leach's storm-petrel (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Gannet (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Guillemot (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Puffin (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xa	Xa	Xa
Seabird assemblage (breeding)*	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xa	Xa	Xa

*** Note that where one of the above potential pathways to LSE exist for a component feature, by definition it also exists for the wider qualifying breeding seabird assemblage.**

a Vessel Disturbance

European storm-petrel and Leach's storm petrel were unrecorded in DAS and considered unlikely to interact with the ECC or Array Area. LSE can be excluded.

Tracking data of gannet from this SPA has shown no interaction with the Projects region. LSE can be excluded.

Puffin foraging range does not extend to the Array Area but does so to the ECC. Considering the distance to the Array Area it is considered unlikely that there will be interaction in the non-breeding season. In addition, the impacts are likely to be localised and temporary, there may be disturbance effects from vessel activities. LSE cannot be excluded.

European storm-petrel and Leach’s storm petrel were unrecorded in DAS and considered unlikely to interact with the ECC or Array Area. LSE can be excluded.

b Distributional Resources

European storm-petrel and Leach’s storm petrel were unrecorded in DAS and considered unlikely to interact with the ECC or Array Area. LSE can be excluded.

Tracking data of gannet from this SPA has shown no interaction with the Projects region. LSE can be excluded.

Puffin foraging range does not extend to the Array Area in the breeding season. Considering the distance to the Array Area it is considered unlikely that there will be interaction in the non-breeding season. LSE can be excluded.

Guillemot foraging range does not extend to the Array Area. These species are not expected to interact with the Project at any time of year and LSE can be excluded.

c Collision Risk

European storm-petrel and Leach’s storm petrel were unrecorded in DAS and considered unlikely to interact with the ECC or Array Area. LSE can be excluded.

Puffin and guillemot foraging range does not extend to the Array Area. These species are not expected to interact with the Project at any time of year. In any case puffin and guillemot are not vulnerable to collision. LSE can be excluded.

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Tracking data of gannet from this SPA has shown no interaction with the Projects region[27]. LSE can be excluded.

Puffins generally fly below the rotor swept area. This feature is therefore unlikely to be affected. LSE can be excluded for these three features at all times of the year.

d Changes to Prey Availability and Behaviour

The presence of the Project does not have potential to impact the foraging of all qualifying features with limited effects predicted on prey species and the Project being sited away from core foraging areas. LSE can be excluded.

e In-combination Effects

No pathway to LSE exists so that the potential for in-combination effects with other plans and projects can be excluded.

3.29 Flannan Isles SPA

Table 3-29 LSE Matrix for marine ornithological features of Flannan Isles SPA

Distance from Project							352 km from ECC; 540 km from Array Area								
Feature	**Vessel disturbance**			**Distributional responses**			**Collision risk**			**Changes in prey availability and behaviour**			**In-combination effects**		
	C	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**
Fulmar (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Leach's storm-petrel (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Kittiwake (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Razorbill (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Guillemot (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Puffin (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Seabird assemblage (breeding)*	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe

*** Note that where one of the above potential pathways to LSE exist for a component feature, by definition it also exists for the wider qualifying breeding seabird assemblage.**

a Vessel Disturbance

The ECC and Array Area lies outside of foraging range for kittiwake, razorbill, guillemot and puffin. It is considered highly unlikely that these features will interact with the Project outside of the breeding season. LSE can therefore be excluded.

Leach's storm petrel were unrecorded in DAS and considered unlikely to interact with the ECC or Array Area. LSE can be excluded.

Fulmar are not considered to be sensitive to disturbance[31]. Considering that disturbance effects from vessel are likely be localised and temporary, LSE can be excluded.

b Distributional Response

The Array Area lies outside of foraging range for kittiwake, razorbill, guillemot and puffin. It is considered highly unlikely that these features will interact with the Project outside of the breeding season. LSE can therefore be excluded.

Leach's storm petrel were unrecorded in DAS and considered unlikely to interact with the Array Area. LSE can be excluded.

c Collision Risk

The Array Area lies outside of foraging range for kittiwake, razorbill, guillemot and puffin. It is considered highly unlikely that these features will interact with the Project outside of the breeding season. LSE can therefore be excluded.

Leach's storm petrel were unrecorded in DAS and considered unlikely to interact with the Array Area. LSE can be excluded.

Fulmar is not vulnerable to collision effects[25 26 31] as a high proportion of birds fly below the rotor swept area. LSE can therefore be excluded.

d Changes to Prey Availability and Behaviour

The presence of the Project does not have potential to impact the foraging of all qualifying features with limited effects predicted on prey species and the Project being sited away from core foraging areas. LSE can be excluded.

e In-combination Effects

No pathway to LSE exists so that the potential for in-combination effects with other plans and projects can be excluded.

3.30 Noss SPA

Table 3-30: LSE Matrix for marine ornithological features of Noss SPA

Distance from Project							282 km from ECC; 347 km from Array Area								
Feature	**Vessel disturbance**			**Distributional responses**			**Collision risk**			**Changes in prey availability and behaviour**			**In-combination effects**		
	C	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**
Kittiwake (breeding)	Xa	Xa	Xa		✓b			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Gannet (breeding)	Xa	Xa	Xa		✓b			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Great skua (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Guillemot (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Puffin (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Fulmar (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Seabird assemblage (breeding)*	Xa	Xa	Xa		✓b			✓c		Xd	Xd	Xd	Xe	✓e	Xe

*** Note that where one of the above potential pathways to LSE exist for a component feature, by definition it also exists for the wider qualifying breeding seabird assemblage.**

a Vessel disturbance

Kittiwake and fulmar are not considered to be highly sensitive to disturbance[31]. Considering that disturbance effects from vessels are likely be localised and temporary, LSE can be excluded.

Foraging range of gannet extends to the Array Area and ECC. Gannet are however are not considered to be highly sensitive to disturbance[31]. Considering that disturbance effects from vessel are likely be localised and temporary, LSE can be excluded.

Great skua are not considered to be highly sensitive to disturbance[31]. Considering that disturbance effects from vessel are likely be localised and temporary, LSE can be excluded.

The ECC and Array Area are not in foraging range of guillemot and puffin. It is considered highly unlikely that these features will interact with the Project outside of the breeding season. LSE can therefore be excluded.

b Distributional Response

During the operation and maintenance phase, kittiwake foraging range does not extend to the Array Area during the breeding season. Components of the SPA population may be present in the non-breeding season however; hence populations may be affected by disturbance/displacement or barrier effects from the presence of WTGs and regular maintenance activity with the Project. LSE cannot be excluded for these features during this phase of the Project.

Foraging range of gannet extends to the Array Area during the breeding season; hence populations may be affected by distributional responses. LSE cannot therefore be excluded.

While great skua is within foraging range of the Array Area, this species has a particularly large foraging range and therefore has extensive alternative marine habitats available for foraging. LSE can be excluded.

While fulmar may forage within the Array Area, this species has a particularly large foraging range and therefore has extensive alternative marine habitats available. Fulmar is not highly vulnerable to distributional responses. LSE can therefore be excluded.

The Array Area is not in foraging range of guillemot and puffin. It is considered highly unlikely that these features will interact with the Project outside of the breeding season. LSE can therefore be excluded.

c Collision Risk

Kittiwake foraging range does not extend to the Array Area from this SPA in the breeding season. Kittiwake from this SPA may however pass through the Array Area in the non-breeding season. LSE cannot therefore be excluded.

There is potential for collision with WTGs for gannet, given its foraging range extends to the Array Area and may fly within the 'at risk' height range within the rotor swept area during the breeding and non-breeding season. LSE cannot be excluded.

While great skua from this SPA are within foraging range of the Array Area, only two individuals were recorded in the DAS (and one within the Array Area). LSE can therefore be excluded.

The Array Area is not in foraging range of guillemot and puffin. It is considered highly unlikely that these features will interact with the Project outside of the breeding season. Both species are not in any case vulnerable to collision. LSE can therefore be excluded.

d Changes to Prey Availability and Behaviour

The presence of the Project does not have potential to impact the foraging of all qualifying features with limited effects predicted on prey species and the Project being sited away from core foraging areas. LSE can be excluded.

e In-combination Effects

Given that effect pathways to LSE exists for kittiwake and gannet, the potential for in-combination effects with other plans and projects remains. No effect pathways have been identified for all other qualifying features and therefore there is no potential for contribution to in-combination effects.

3.31 St. Kilda SPA

Table 3-31: LSE Matrix for marine ornithological features of St. Kilda SPA

Distance from Project							399 km from ECC; 588 km from Array Area								
Feature	Vessel disturbance			Distributional responses			Collision risk			Changes in prey availability and behaviour			In-combination effects		
	C	OM	D	C	OM	D	C	OM	D	C	OM	D	C	OM	D
Leach's storm-petrel (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
European storm-petrel	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Manx shearwater (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Kittiwake (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Great skua (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Fulmar (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Gannet (breeding)	Xa	Xa	Xa		✓b			✓c		Xd	Xd	Xd	Xe	✓e	✓e
Razorbill (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Guillemot (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Puffin (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Seabird assemblage (breeding)*	Xa	Xa	Xa		✓b			✓c		Xd	Xd	Xd	Xe	✓e	Xe

*** Note that where one of the above potential pathways to LSE exist for a component feature, by definition it also exists for the wider qualifying breeding seabird assemblage.**

a Vessel Disturbance

Leach's storm petrel, European storm petrel and Manx shearwater were unrecorded in DAS and considered unlikely to interact with the ECC or Array Area. LSE can be excluded.

Foraging range of gannet extends to the Array Area and ECC. Gannet are however are not considered to be highly sensitive to disturbance[31]. Considering that disturbance effects from vessel are likely be localised and temporary, LSE can be excluded.

Great skua and fulmar are not considered to be highly sensitive to disturbance[31]. Considering that disturbance effects from vessel are likely be localised and temporary, LSE can be excluded.

The ECC and Array Area are not in foraging range of kittiwake, razorbill, guillemot and puffin. It is considered highly unlikely that these features will interact with the Project outside of the breeding season. LSE can therefore be excluded.

b Distributional Response

Leach's storm petrel, European storm petrel and Manx shearwater were unrecorded in DAS and considered unlikely to interact with the ECC or Array Area. LSE can be excluded.

Foraging range of gannet extends to the Array Area during the breeding season, hence populations may be affected by distributional responses. LSE cannot therefore be excluded.

While fulmar may forage within the Array Area, this species has a particularly large foraging range and therefore has extensive alternative marine habitats available. Fulmar is not highly vulnerable to distributional responses. LSE can therefore be excluded.

While great skua is within foraging range of the Array Area, this species has a particularly large foraging range and therefore has extensive alternative marine habitats available for foraging. LSE can be excluded.

The Array Area is not in foraging range of kittiwake, razorbill, guillemot and puffin. It is considered highly unlikely that these features will interact with the Project outside of the breeding season. LSE can therefore be excluded.

c Collision Risk

Leach's storm petrel, European storm petrel and Manx shearwater were unrecorded in DAS and considered unlikely to interact with the ECC or Array Area. LSE can be excluded.

There is potential for collision with WTGs for gannet, given its foraging range extends to the Array Area and may fly within the 'at risk' height range within the rotor swept area during the breeding and non-breeding season. LSE cannot be excluded.

The Array Area is not in foraging range of kittiwake, razorbill, guillemot and puffin. It is considered highly unlikely that these features will interact with the Project outside of the breeding season. LSE can therefore be excluded.

While great skua from this SPA are within foraging range of the Array Area, only two individuals were recorded in the DAS (and one within the Array Area). LSE can therefore be excluded.

Fulmar is not vulnerable to collision effects[25 26 31] as a high proportion of birds fly below the rotor swept area. LSE can therefore be excluded.

d Changes to Prey Availability and Behaviour

The presence of the Project does not have potential to impact the foraging of all qualifying features with limited effects predicted on prey species and the Project being sited away from core foraging areas. LSE can be excluded.

e In-combination Effects

Given that effect pathways to LSE exists for gannet, the potential for in-combination effects with other plans and projects remains. No effect pathways have been identified for all other qualifying features and therefore there is no potential for contribution to in-combination effects.

3.32 Mingulay and Berneray SPA

Table 3-32: LSE Matrix for marine ornithological features of Mingulay and Berneray SPA

Distance from Project							356 km from ECC; 540 km from Array Area								
Feature	**Vessel disturbance**			**Distributional responses**			**Collision risk**			**Changes in prey availability and behaviour**			**In-combination effects**		
	C	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**
Fulmar (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Kittiwake (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Razorbill (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Guillemot (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Puffin (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Shag (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Seabird assemblage (breeding)*	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe

*** Note that where one of the above potential pathways to LSE exist for a component feature, by definition it also exists for the wider qualifying breeding seabird assemblage.**

a Vessel Disturbance

Fulmar are not considered to be sensitive to disturbance[31]. Considering that disturbance effects from vessel are likely be localised and temporary, In addition it is considered highly unlikely that fulmar from this SPA will interact with the Project due to the 'at sea' distance between them [31] [28] [29] [30]. LSE can therefore be excluded.

The ECC and Array Area are not in foraging range of kittiwake, razorbill, guillemot, puffin and shag. It is considered highly unlikely that these features will interact with the Project outside of the breeding season. LSE can therefore be excluded.

b Distributional Response

It is considered highly unlikely that fulmar from this SPA will interact with the Project due to the ‘at sea’ distance between them [31 28 29 30]. LSE can therefore be excluded.

The Array Area is not in foraging range of kittiwake, razorbill, guillemot, puffin and shag. It is considered highly unlikely that these features will interact with the Project outside of the breeding season. LSE can therefore be excluded.

c Collision Risk

Fulmar is not vulnerable to collision effects[25 26 31] as a high proportion of birds fly below the rotor swept area. LSE can therefore be excluded.

The Array Area is not in foraging range of kittiwake, razorbill, guillemot, puffin and shag. It is considered highly unlikely that these features will interact with the Project outside of the breeding season. LSE can therefore be excluded.

d Changes to Prey Availability and Behaviour

It is considered highly unlikely that fulmar from this SPA will interact with the Project due to the ‘at sea’ distance between them[31 28 29 30]. LSE can therefore be excluded.

The presence of the Project does not have potential to impact the foraging of all other qualifying features with limited effects predicted on prey species and the Project being sited away from core foraging areas. LSE can be excluded.

e In-combination Effects

No pathway to LSE exists so that the potential for in-combination effects with other plans and projects can be excluded.

3.33 Ailsa Craig SPA

Table 3-33: LSE Matrix for marine ornithological features of Ailsa Craig SPA

Distance from Project								315 km from ECC; 442 km from Array Area							
Feature	Vessel disturbance			Distributional responses			Collision risk			Changes in prey availability and behaviour			In-combination effects		
	C	OM	D	C	OM	D	C	OM	D	C	OM	D	C	OM	D
Herring gull (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Lesser black-backed gull (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Gannet (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Kittiwake (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Guillemot (breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Seabird assemblage (breeding)*	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe

*** Note that where one of the above potential pathways to LSE exist for a component feature, by definition it also exists for the wider qualifying breeding seabird assemblage.**

a Vessel Disturbance

The ECC and Array Area are not in foraging range of herring gull, lesser black-backed gull, kittiwake and guillemot. It is considered highly unlikely that these features will interact with the Project outside of the breeding season. LSE can therefore be excluded.

Tracking data of gannet from this SPA has shown no interaction with the Projects region. LSE can be excluded.

b Distributional Response

The Array Area is not in foraging range of herring gull, lesser black-backed gull, kittiwake and guillemot. It is considered highly unlikely that these features will interact with the Project outside of the breeding season. LSE can therefore be excluded.

Tracking data of gannet from this SPA has shown no interaction with the Projects region. LSE can be excluded.

c Collision Risk

The Array Area is not in foraging range of herring gull, lesser black-backed gull, kittiwake and guillemot. It is considered highly unlikely that these features will interact with the Project outside of the breeding season. LSE can therefore be excluded.

Tracking data of gannet from this SPA has shown no interaction with the Projects region. LSE can be excluded.

d Changes to Prey Availability and Behaviour

The presence of the Project does not have potential to impact the foraging of all qualifying features with limited effects predicted on prey species and the Project being sited away from core foraging areas. LSE can be excluded.

e In-combination Effects

No pathway to LSE exists so that the potential for in-combination effects with other plans and projects can be excluded.

3.34 Moray Firth SPA

Table 3-34: LSE Matrix for migratory waterbird features of Moray Firth SPA

Distance from Project															
							94 km from ECC; 282 km from Array Area								
Feature	**Vessel disturbance**			**Distributional responses**			**Collision risk**			**Changes in prey availability and behaviour**			**In-combination effects**		
	C	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**
Great northern diver (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Red-throated diver (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Slavonian grebe (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Scaup (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Eider (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Long-tailed duck (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Common scoter (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Velvet scoter (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Goldeneye (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Red-breasted merganser (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Shag (non-breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe

a Vessel Disturbance

The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.

b Distributional Response

The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.

c Collision Risk

The MSS strategic assessment report concluded that at a strategic level, the populations of non-seabird species which pass through Scottish waters do not appear to be at risk of significant levels of additional mortality due to collisions with Scottish offshore windfarms.

It is however evident the number of offshore wind projects and therefore the number of WTGs has increased notably since the publication of the MSS report. An update to the collision risk for migrating birds in Scottish waters was completed by the British Trust for Ornithology in 2023[22]. A CRM specifically for migratory birds is not currently available and Woodward *et al*.[31] outline the scope of a stochastic tool that will be part of a subsequent work package.

The Array Area is considerably offshore, located approximately 185 km offshore east of Aberdeen, and it is considered likely that interactions with migratory birds will be limited. However, considering that Woodward *et al*.[31]outlines that there is, to some degree, potential connectivity with migratory all qualifying features with the exception of shag. LSE cannot be excluded.

d Changes in Prey Availability and Behaviour

The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.

e In-combination Effects

Given that effect pathways to LSE exists for collision risk on all qualifying features. except for shag, the potential for in-combination effects with other plans and projects remains. No effect pathways have been identified for shag and therefore there is no potential for contribution to in-combination effects.

3.35 Loch of Skene SPA/Ramsar site

Table 3-35: LSE Matrix for migratory waterbird features of Loch of Skene SPA/Ramsar site

Distance from Project							46 km from ECC; 220 km from Array Area								
Feature	Vessel disturbance			Distributional responses			Collision risk			Changes in prey availability and behaviour			In-combination effects		
	C	OM	D	C	OM	D	C	OM	D	C	OM	D	C	OM	D
Greylag goose (non-breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Goldeneye (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Goosander (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe

a Vessel Disturbance

The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.

b Distributional Responses

The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.

c Collision Risk

The MSS strategic assessment report concluded that at a strategic level, the populations of non-seabird species which pass through Scottish waters do not appear to be at risk of significant levels of additional mortality due to collisions with Scottish offshore windfarms.

It is however evident the number of offshore wind projects and therefore the number of WTGs has increased notably since the publication of the MSS report. An update to the collision risk for migrating birds in Scottish waters was completed by the British Trust for Ornithology in 2023[22]. A CRM specifically for migratory birds is not currently available and Woodward *et al*.[31] outline the scope of a stochastic tool that will be part of a subsequent work package.

The Array Area is considerably offshore, located approximately 185 km offshore east of Aberdeen, and it is considered likely that interactions with migratory birds will be limited. However, considering that Woodward *et al*.[31] outlines that there is, to some degree, potential connectivity with goldeneye and goosander. Therefore, LSE cannot be excluded. There is considered to be no connectivity with greylag goose migratory routes and LSE is excluded.

d Changes in Prey Availability and Behaviour

The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.

e In-combination Effects

Given that effect pathways to LSE exists for collision risk on goldeneye and goosander the potential for in-combination effects with other plans and projects remains. An exception is greylag goose where no effect pathways have been identified and therefore there is no potential for contribution to in-combination effects.

3.36 Moray and Nairn Coast SPA/Ramsar site

Table 3-36: LSE Matrix for migratory waterbird features of Moray and Nairn Coast SPA/Ramsar site

Distance from Project							80 km from ECC; 269 km from Array Area								
Feature	Vessel disturbance			Distributional responses			Collision			Changes in prey availability and behaviour			In-combination effects		
	C	OM	D	C	OM	D	C	OM	D	C	OM	D	C	OM	D
Bar-tailed godwit (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Pink-footed goose (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Greylag goose (non-breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Redshank (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Red-breasted merganser (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Dunlin (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Oystercatcher (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Wigeon (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Waterbird assemblage (non-breeding)*	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe

*Note that where one of the above potential pathways to LSE exist for a component feature, by definition it also exists for the wider qualifying non-breeding waterbird assemblage.

a Vessel Disturbance

The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.

b Distributional Responses

The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.

c Collision Risk

The MSS strategic assessment report concluded that at a strategic level, the populations of non-seabird species which pass through Scottish waters do not appear to be at risk of significant levels of additional mortality due to collisions with Scottish offshore windfarms.

It is however evident the number of offshore wind projects and therefore the number of WTGs has increased notably since the publication of the MSS report. An update to the collision risk for migrating birds in Scottish waters was completed by the British Trust for Ornithology in 2023[22]. A CRM specifically for migratory birds is not currently available and Woodward *et al*. 31 outline the scope of a stochastic tool that will be part of a subsequent work package.

The Array Area is considerably offshore, located approximately 185 km offshore east of Aberdeen, and it is considered likely that interactions with migratory birds will be limited. However, considering that Woodward *et al*. 31outlines that there is, to some degree, potential connectivity with all qualifying features except for greylag goose. LSE cannot be excluded.

d Changes in Prey Availability and Behaviour

The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.

e In-combination Effects

Given that effect pathways to LSE exists for collision risk on all qualifying features, except for greylag goose, the potential for in-combination effects with other plans and projects remains. No effect pathways have been identified for greylag goose and therefore there is no potential for contribution to in-combination effects.

3.37 Loch Spynie SPA/Ramsar site

Table 3-37: LSE Matrix for migratory waterbird features of Loch Spynie SPA/Ramsar site

Distance from Project							92 km from ECC; 280 km from Array Area								
Feature	Vessel disturbance			Distributional responses			Collision risk			Changes in prey availability and behaviour			In-combination effects		
	C	OM	D	C	OM	D	C	OM	D	C	OM	D	C	OM	D
Greylag goose (non-breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe

a Vessel Disturbance

Greylag goose will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.

b Distributional Responses

Greylag goose from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.

c Collision Risk

The MSS strategic assessment report concluded that at a strategic level, the populations of non-seabird species which pass through Scottish waters do not appear to be at risk of significant levels of additional mortality due to collisions with Scottish offshore windfarms.

It is however evident the number of offshore wind projects and therefore the number of WTGs has increased notably since the publication of the MSS report. An update to the collision risk for migrating birds in Scottish waters was completed by the British Trust for Ornithology in 2023[22]. A CRM specifically for migratory birds is not currently available and Woodward *et al*.[31]outline the scope of a stochastic tool that will be part of a subsequent work package.

The Array Area is considerably offshore, located approximately 185 km offshore east of Aberdeen, and it is considered likely that interactions with migratory birds will be limited. Woodward *et al*. [31]outlines that there is no potential connectivity between the Project Array Area and greylag goose migratory routes. LSE can therefore be excluded.

d Changes in Prey Availability and Behaviour

The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.

e In-combination Effects

No pathway to LSE exists so that the potential for in-combination effects with other plans and projects can be excluded.

3.38 Montrose Basin SPA/Ramsar site

Table 3-38: LSE Matrix for migratory waterbird features of Montrose Basin SPA/Ramsar site

Distance from Project															
							91 km from ECC; 232 km from Array Area								
Feature	**Vessel disturbance**			**Distributional responses**			**Collision risk**			**Changes in prey availability and behaviour**			**In-combination effects**		
	C	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**
Pink-footed goose (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Greylag goose (non-breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Redshank (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Oystercatcher (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Eider (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Wigeon (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Knot (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Dunlin (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Shelduck (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Waterbird assemblage (non-breeding)*	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe

*Note that where one of the above potential pathways to LSE exist for a component feature, by definition it also exists for the wider qualifying non-breeding waterbird assemblage.

a Vessel Disturbance

The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.

b Distributional Responses

The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.

c Collision Risk

The MSS strategic assessment report concluded that at a strategic level, the populations of non-seabird species which pass through Scottish waters do not appear to be at risk of significant levels of additional mortality due to collisions with Scottish offshore windfarms.

It is however evident the number of offshore wind projects and therefore the number of WTGs has increased notably since the publication of the MSS report. An update to the collision risk for migrating birds in Scottish waters was completed by the British Trust for Ornithology in 2023[22]. A CRM specifically for migratory birds is not currently available and Woodward *et al*. [31]outline the scope of a stochastic tool that will be part of a subsequent work package.

The Array Area is considerably offshore, located approximately 185 km offshore east of Aberdeen, and it is considered likely that interactions with migratory birds will be limited. However, considering that Woodward *et al*. [31]outlines that there is, to some degree, potential connectivity with all qualifying features except for greylag goose. LSE cannot be excluded.

d Changes in Prey Availability and Behaviour

The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.

e In-combination effects

Given that effect pathways to LSE exists for collision risk on all qualifying features, except for greylag goose, the potential for in-combination effects with other plans and projects remains. No effect pathways have been identified for greylag goose, therefore there is no potential for contribution to in-combination effects.

3.39 Loch of Kinnordy SPA/Ramsar site

Table 3-39: LSE Matrix for migratory waterbird features of Loch of Kinnordy SPA/Ramsar site

Distance from Project							**114 km from ECC; 266 km from Array Area**								
Feature	**Vessel disturbance**			**Distributional responses**			**Collision risk**			**Changes in prey availability and behaviour**			**In-combination effects**		
	C	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**
Pink-footed goose (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Greylag goose (non-breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe

a Vessel Disturbance

The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.

b Distributional Responses

The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.

c Collision Risk

The MSS strategic assessment report concluded that at a strategic level, the populations of non-seabird species which pass through Scottish waters do not appear to be at risk of significant levels of additional mortality due to collisions with Scottish offshore windfarms.

It is however evident the number of offshore wind projects and therefore the number of WTGs has increased notably since the publication of the MSS report. An update to the collision risk for migrating birds in Scottish waters was completed by the British Trust for Ornithology in 2023[22]. A CRM specifically for migratory birds is not currently available and Woodward *et al*. [31]outline the scope of a stochastic tool that will be part of a subsequent work package.

The Array Area is considerably offshore, located approximately 185 km offshore east of Aberdeen, and it is considered likely that interactions with migratory birds will be limited. However, considering that Woodward *et al*. [31]outlines that there is, to some degree, potential connectivity with migratory pink-footed goose. LSE cannot be excluded. There is considered to be no connectivity with greylag goose migratory routes and LSE is excluded. .

d Changes to Prey Availability and Behaviour

The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.

e In-combination Effects

Given that effect pathways to LSE exists for collision risk for pink-footed goose, the potential for in-combination effects with other plans and projects remains. No effect pathways have been identified for greylag goose and therefore there is no potential for contribution to in-combination effects.

3.40 Dornoch Firth and Loch Fleet SPA/Ramsar site

Table 3-40: LSE Matrix for migratory waterbird features of Dornoch Firth and Loch Fleet SPA/Ramsar site

Distance from Project									**127 km from ECC; 314 km from Array Area**						
Feature	**Vessel disturbance**			**Distributional responses**			**Collision risk**			**Changes in prey availability and behaviour**			**In-combination effects**		
	C	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**
Bar-tailed godwit (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Greylag goose (non-breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Wigeon (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Curlew (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Teal (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Scaup (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Redshank (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Dunlin (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Oystercatcher (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Waterbird assemblage (non-breeding)*	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe

***Note that where one of the above potential pathways to LSE exist for a component feature, by definition it also exists for the wider qualifying non-breeding waterbird assemblage.**

a Vessel Disturbance

The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.

b Distributional Responses

The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.

c Collision Risk

The MSS strategic assessment report concluded that at a strategic level, the populations of non-seabird species which pass through Scottish waters do not appear to be at risk of significant levels of additional mortality due to collisions with Scottish offshore windfarms.

It is however evident the number of offshore wind projects and therefore the number of WTGs has increased notably since the publication of the MSS report. An update to the collision risk for migrating birds in Scottish waters was completed by the British Trust for Ornithology in 2023[22]. A CRM specifically for migratory birds is not currently available and Woodward *et al*. [31]outline the scope of a stochastic tool that will be part of a subsequent work package.

The Array Area is considerably offshore, located approximately 185 km offshore east of Aberdeen, and it is considered likely that interactions with migratory birds will be limited. However, considering that Woodward *et al*. [31]outlines that there is, to some degree, potential connectivity with all qualifying features except for greylag goose. LSE cannot be excluded.

d Changes to Prey Availability and Behaviour

The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.

e In-combination Effects

Given that effect pathways to LSE exists for collision risk on all qualifying features, except for greylag goose, the potential for in-combination effects with other plans and projects remains. No effect pathways have been identified for greylag goose and therefore there is no potential for contribution to in-combination effects.

3.41 Firth of Tay and Eden Estuary SPA/Ramsar site

Table 3-41: LSE Matrix for migratory waterbird features of Firth of Tay and Eden Estuary SPA/Ramsar site

Distance from Project							121 km from ECC; 252 km from Array Area								
Feature	Vessel disturbance			Distributional responses			Collision risk			Changes in prey availability and behaviour			In-combination effects		
	C	OM	D	C	OM	D	C	OM	D	C	OM	D	C	OM	D
Bar-tailed godwit (non-breeding)	Xa	Xa	Xa	Xb	Xb	Xb		✓c		Xd	Xd	Xd	Xe	✓e	Xe
Redshank (non-breeding)	Xa	Xa	Xa	Xb	Xb	Xb		✓c		Xd	Xd	Xd	Xe	✓e	Xe
Greylag goose (non-breeding)	Xa	Xa	Xa	Xb	Xb	Xb		Xc		Xd	Xd	Xd	Xe	Xe	Xe
Pink-footed goose (non-breeding)	Xa	Xa	Xa	Xb	Xb	Xb		✓c		Xd	Xd	Xd	Xe	✓e	Xe
Velvet scoter (non-breeding)	Xa	Xa	Xa	Xb	Xb	Xb		✓c		Xd	Xd	Xd	Xe	✓e	Xe
Shelduck (non-breeding)	Xa	Xa	Xa	Xb	Xb	Xb		✓c		Xd	Xd	Xd	Xe	✓e	Xe
Eider (non-breeding)	Xa	Xa	Xa	Xb	Xb	Xb		✓c		Xd	Xd	Xd	Xe	✓e	Xe
Common scoter (non-breeding)	Xa	Xa	Xa	Xb	Xb	Xb		✓c		Xd	Xd	Xd	Xe	✓e	Xe
Black-tailed godwit (non-breeding)	Xa	Xa	Xa	Xb	Xb	Xb		✓c		Xd	Xd	Xd	Xe	✓e	Xe
Goldeneye (non-breeding)	Xa	Xa	Xa	Xb	Xb	Xb		✓c		Xd	Xd	Xd	Xe	✓e	Xe
Red-breasted merganser (non-breeding)	Xa	Xa	Xa	Xb	Xb	Xb		✓c		Xd	Xd	Xd	Xe	✓e	Xe
Goosander (non-breeding)	Xa	Xa	Xa	Xb	Xb	Xb		✓c		Xd	Xd	Xd	Xe	✓e	Xe

Distance from Project							**121 km from ECC; 252 km from Array Area**								
Feature	**Vessel disturbance**			**Distributional responses**			**Collision risk**			**Changes in prey availability and behaviour**			**In-combination effects**		
	C	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**
Oystercatcher (non-breeding)	Xa	Xa	Xa	Xb	Xb	Xb		✓c		Xd	Xd	Xd	Xe	✓e	Xe
Grey plover (non-breeding)	Xa	Xa	Xa	Xb	Xb	Xb		✓c		Xd	Xd	Xd	Xe	✓e	Xe
Sanderling (non-breeding)	Xa	Xa	Xa	Xb	Xb	Xb		✓c		Xd	Xd	Xd	Xe	✓e	Xe
Dunlin (non-breeding)	Xa	Xa	Xa	Xb	Xb	Xb		✓c		Xd	Xd	Xd	Xe	✓e	Xe
Long-tailed duck (non-breeding)	Xa	Xa	Xa	Xb	Xb	Xb		✓c		Xd	Xd	Xd	Xe	✓e	Xe
Waterbird assemblage (non-breeding)*	Xa	Xa	Xa	Xb	Xb	Xb		✓c		Xd	Xd	Xd	Xe	✓e	Xe

*Note that where one of the above potential pathways to LSE exist for a component feature, by definition it also exists for the wider qualifying non-breeding waterbird assemblage.

a Vessel Disturbance

The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.

b Distributional Responses

The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.

c Collision Risk

The MSS strategic assessment report concluded that at a strategic level, the populations of non-seabird species which pass through Scottish waters do not appear to be at risk of significant levels of additional mortality due to collisions with Scottish offshore windfarms.

It is however evident the number of offshore wind projects and therefore the number of WTGs has increased notably since the publication of the MSS report. An update to the collision risk for migrating birds in Scottish waters was completed by the British Trust for Ornithology in 2023[22]. A CRM specifically for migratory birds is not currently available and Woodward *et al*. [31]outline the scope of a stochastic tool that will be part of a subsequent work package.

The Array Area is considerably offshore, located approximately 185 km offshore east of Aberdeen, and it is considered likely that interactions with migratory birds will be limited. However, considering that Woodward *et al*. [31]outlines that there is, to some degree, potential connectivity with all qualifying features, except for greylag goose. LSE cannot be excluded.

d Changes to Prey Availability and Behaviour

The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.

e In-combination Effects

Given that effect pathways to LSE exists for collision risk on all qualifying features, except for greylag goose, the potential for in-combination effects with other plans and projects remains. No effect pathways have been identified for greylag goose and therefore there is no potential for contribution to in-combination effects.

3.42 Inner Moray Firth SPA/Ramsar site

Table 3-42: LSE Matrix for migratory waterbird features of Inner Moray Firth SPA/Ramsar site

Distance from Project							129 km from ECC; 318 km from Array Area								
Feature	**Vessel disturbance**			**Distributional responses**			**Collision risk**			**Changes in prey availability and behaviour**			**In-combination effects**		
	C	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**
Bar-tailed godwit (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Greylag goose (non-breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Red-breasted merganser (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Redshank (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Waterbird assemblage (non-breeding)*	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe

*Note that where one of the above potential pathways to LSE exist for a component feature, by definition it also exists for the wider qualifying non-breeding waterbird assemblage.

a Vessel Disturbance

The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.

b Distributional Responses

The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.

c Collision Risk

The MSS strategic assessment report concluded that at a strategic level, the populations of non-seabird species which pass through Scottish waters do not appear to be at risk of significant levels of additional mortality due to collisions with Scottish offshore windfarms.

It is however evident the number of offshore wind projects and therefore the number of WTGs has increased notably since the publication of the MSS report. An update to the collision risk for migrating birds in Scottish waters was completed by the British Trust for Ornithology in 2023[22]. A CRM specifically for migratory birds is not currently available and Woodward *et al*. [31]outline the scope of a stochastic tool that will be part of a subsequent work package.

The Array Area is considerably offshore, located approximately 185 km offshore east of Aberdeen, and it is considered likely that interactions with migratory birds will be limited. However, considering that Woodward *et al*. [31]outlines that there is, to some degree, potential connectivity with all qualifying features, except for greylag goose. LSE cannot be excluded.

d Changes to Prey Availability and Behaviour

The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.

e In-combination Effects

Given that effect pathways to LSE exists for collision risk on all qualifying features, except for greylag goose, the potential for in-combination effects with other plans and projects remains. No effect pathways have been identified for greylag goose and therefore there is no potential for contribution to in-combination effects.

3.43 Loch Eye SPA/Ramsar site

Table 3-43: LSE Matrix for migratory waterbird features of Loch Eye SPA/Ramsar site

Distance from Project															
						134 km from ECCI; 322 km from Array Area									
Feature	**Vessel disturbance**			**Distributional responses**			**Collision risk**			**Changes in prey availability and behaviour**			**In-combination effects**		
	C	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**
Whooper swan (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Greylag goose (non-breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe

a Vessel Disturbance

The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.

b Distributional Responses

The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.

c Collision Risk

The MSS strategic assessment report concluded that at a strategic level, the populations of non-seabird species which pass through Scottish waters do not appear to be at risk of significant levels of additional mortality due to collisions with Scottish offshore windfarms.

It is however evident the number of offshore wind projects and therefore the number of WTGs has increased notably since the publication of the MSS report. An update to the collision risk for migrating birds in Scottish waters was completed by the British Trust for Ornithology in 2023[22]. A CRM specifically for migratory birds is not currently available and Woodward *et al*. [31]outline the scope of a stochastic tool that will be part of a subsequent work package.

The Array Area is considerably offshore, located approximately 185 km offshore east of Aberdeen, and it is considered likely that interactions with migratory birds will be limited. However, considering that Woodward *et al*. [31]outlines that there is, to some degree, potential connectivity with migratory whooper swan, LSE cannot be excluded. There is considered to be no connectivity with greylag goose migratory routes and LSE is excluded.

d Changes to Prey Availability and Behaviour

The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.

e In-combination Effects

Given that effect pathways to LSE exists for collision risk for whooper swan, the potential for in-combination effects with other plans and projects remains. No effect pathways have been identified for greylag goose, therefore there is no potential for contribution to in-combination effects.

3.44 Caithness Lochs SPA/Ramsar site

Table 3-44: LSE Matrix for migratory waterbird features of Caithness Lochs SPA/Ramsar site

Distance from Project							141 km from ECC; 303 km from Array Area								
Feature	Vessel disturbance			Distributional responses			Collision risk			Changes in prey availability and behaviour			In-combination effects		
	C	OM	D	C	OM	D	C	OM	D	C	OM	D	C	OM	D
Whooper swan (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Greenland white-fronted goose (non-breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Greylag goose (non-breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe

a Vessel Disturbance

The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.

b Distributional Responses

The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.

c Collision Risk

The MSS strategic assessment report concluded that at a strategic level, the populations of non-seabird species which pass through Scottish waters do not appear to be at risk of significant levels of additional mortality due to collisions with Scottish offshore windfarms.

It is however evident the number of offshore wind projects and therefore the number of WTGs has increased notably since the publication of the MSS report. An update to the collision risk for migrating birds in Scottish waters was completed by the British Trust for Ornithology in 2023[22]. A CRM specifically for migratory birds is not currently available and Woodward *et al*. [31] outline the scope of a stochastic tool that will be part of a subsequent work package.

The Array Area is considerably offshore, located approximately 185 km offshore east of Aberdeen, and it is considered likely that interactions with migratory birds will be limited. However, considering that Woodward *et al*. [31]outlines that there is, to some degree, potential connectivity with migratory whooper swan, LSE cannot be excluded. There is considered to be no connectivity with Greenland white-fronted goose or greylag goose migratory routes and LSE is excluded.

d Changes to Prey Availability and Behaviour

The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.

e In-combination Effects

Given that effect pathways to LSE exists for collision risk for whooper swan, the potential for in-combination effects with other plans and projects remains. No effect pathways have been identified for greylag goose and Greenland white-fronted goose, therefore there is no potential for contribution to in-combination effects.

3.45 Cromarty Firth SPA/Ramsar site

Table 3-45: LSE Matrix for migratory waterbird features of Cromarty Firth SPA/Ramsar site

Distance from Project							136 km from ECC; 324 km from Array Area								
Feature	Vessel disturbance			Distributional responses			Collision risk			Changes in prey availability and behaviour			In-combination effects		
	C	OM	D	C	OM	D	C	OM	D	C	OM	D	C	OM	D
Whooper swan (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Bar-tailed godwit (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Greylag goose (non-breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Redshank (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Curlew (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Red-breasted merganser (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Scaup (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Pintail (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Wigeon (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Dunlin (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Oystercatcher (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Waterbird assemblage (non-breeding)*	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe

*Note that where one of the above potential pathways to LSE exist for a component feature, by definition it also exists for the wider qualifying non-breeding waterbird assemblage.

a Vessel Disturbance

The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.

b Distributional Responses

The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.

c Collision Risk

The MSS strategic assessment report concluded that at a strategic level, the populations of non-seabird species which pass through Scottish waters do not appear to be at risk of significant levels of additional mortality due to collisions with Scottish offshore windfarms.

It is however evident the number of offshore wind projects and therefore the number of WTGs has increased notably since the publication of the MSS report. An update to the collision risk for migrating birds in Scottish waters was completed by the British Trust for Ornithology in 2023[22]. A CRM specifically for migratory birds is not currently available and Woodward *et al*. [31]outline the scope of a stochastic tool that will be part of a subsequent work package.

The Array Area is considerably offshore, located approximately 185 km offshore east of Aberdeen, and it is considered likely that interactions with migratory birds will be limited. However, considering that Woodward *et al*. [31]outlines that there is, to some degree, potential connectivity with all qualifying features, except for greylag goose. LSE cannot be excluded.

d Changes to Prey Availability and Behaviour

The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.

e In-combination Effects

Given that effect pathways to LSE exists for collision risk on all qualifying features, except for greylag goose, the potential for in-combination effects with other plans and projects remains. No effect pathways have been identified for greylag goose and therefore there is no potential for contribution to in-combination effects.

3.46 Firth of Forth SPA/Ramsar site

Table 3-46: LSE Matrix for migratory waterbird features of Firth of Forth SPA/Ramsar site

Distance from Project							139 km from ECC; 252 km from Array Area								
Feature	Vessel disturbance			Distributional responses			Collision risk			Changes in prey availability and behaviour			In-combination effects		
	C	OM	D	C	OM	D	C	OM	D	C	OM	D	C	OM	D
Red-throated diver (non-breeding)	Xa	Xa	Xa		Xb	Xb		✓c		Xd	Xd	Xd	Xe	✓e	Xe
Slavonian grebe (non-breeding)	Xa	Xa	Xa		Xb	Xb		✓c		Xd	Xd	Xd	Xe	✓e	Xe
Golden plover (non-breeding)	Xa	Xa	Xa		Xb	Xb		✓c		Xd	Xd	Xd	Xe	✓e	Xe
Bar-tailed godwit (non-breeding)	Xa	Xa	Xa		Xb	Xb		✓c		Xd	Xd	Xd	Xe	✓e	Xe
Pink-footed goose (non-breeding)	Xa	Xa	Xa		Xb	Xb		✓c		Xd	Xd	Xd	Xe	✓e	Xe
Shelduck (non-breeding)	Xa	Xa	Xa		Xb	Xb		✓c		Xd	Xd	Xd	Xe	✓e	Xe
Knot (non-breeding)	Xa	Xa	Xa		Xb	Xb		✓c		Xd	Xd	Xd	Xe	✓e	Xe
Redshank (non-breeding)	Xa	Xa	Xa		Xb	Xb		✓c		Xd	Xd	Xd	Xe	✓e	Xe
Turnstone (non-breeding)	Xa	Xa	Xa		Xb	Xb		✓c		Xd	Xd	Xd	Xe	✓e	Xe
Scaup (non-breeding)	Xa	Xa	Xa		Xb	Xb		✓c		Xd	Xd	Xd	Xe	✓e	Xe
Great crested grebe (non-breeding)	Xa	Xa	Xa		Xb	Xb		✓c		Xd	Xd	Xd	Xe	✓e	Xe
Cormorant (non-breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Curlew (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Eider (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe

Distance from Project							139 km from ECC; 252 km from Array Area								
Feature	**Vessel disturbance**			**Distributional responses**			**Collision risk**			**Changes in prey availability and behaviour**			**In-combination effects**		
	C	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**
Long-tailed duck (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Common scoter (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Velvet scoter (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Goldeneye (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Red-breasted merganser (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Oystercatcher (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Ringed plover (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Grey plover (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Dunlin (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Mallard (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Lapwing (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Wigeon (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Waterbird assemblage (non-breeding)*	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe

*Note that where one of the above potential pathways to LSE exist for a component feature, by definition it also exists for the wider qualifying non-breeding waterbird assemblage.

a Vessel Disturbance

The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.

b Distributional Responses

The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.

c Collision rRsk

The MSS strategic assessment report concluded that at a strategic level, the populations of non-seabird species which pass through Scottish waters do not appear to be at risk of significant levels of additional mortality due to collisions with Scottish offshore windfarms.

It is however evident the number of offshore wind projects and therefore the number of WTGs has increased notably since the publication of the MSS report. An update to the collision risk for migrating birds in Scottish waters was completed by the British Trust for Ornithology in 2023[22]. A CRM specifically for migratory birds is not currently available and Woodward *et al*. [3131]outline the scope of a stochastic tool that will be part of a subsequent work package.

The Array Area is considerably offshore, located approximately 185 km offshore east of Aberdeen, and it is considered likely that interactions with migratory birds will be limited. However, considering that Woodward *et al*. [31]outlines that there is, to some degree, potential connectivity with all qualifying features, except for cormorant. LSE cannot be excluded.

d Changes to Prey Availability and Behaviour

The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.

e In-combination Effects

Given that effect pathways to LSE exists for collision risk on all qualifying features, except for cormorant, the potential for in-combination effects with other plans and projects remains. No effect pathways have been identified for cormorant and therefore there is no potential for contribution to in-combination effects.

3.47 Cameron Reservoir SPA/Ramsar site

Table 3-47: LSE Matrix for migratory waterbird features of Cameron Reservoir SPA/Ramsar site

Distance from Project							143 km from ECC; 266 km from Array Area								
Feature	**Vessel disturbance**			**Distributional responses**			**Collision risk**			**Changes in prey availability and behaviour**			**In-combination effects**		
	C	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**
Pink-footed goose (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe

a Vessel Disturbance

Pink-footed goose from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.

b Distributional Responses

Pink-footed goose from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.

c Collision Risk

The MSS strategic assessment report concluded that at a strategic level, the populations of non-seabird species which pass through Scottish waters do not appear to be at risk of significant levels of additional mortality due to collisions with Scottish offshore windfarms.

It is however evident the number of offshore wind projects and therefore the number of WTGs has increased notably since the publication of the MSS report. An update to the collision risk for migrating birds in Scottish waters was completed by the British Trust for Ornithology in 2023[22]. A CRM specifically for migratory birds is not currently available and Woodward *et al*. [3131]outline the scope of a stochastic tool that will be part of a subsequent work package.

The Array Area is considerably offshore, located approximately 185 km offshore east of Aberdeen, and it is considered likely that interactions with migratory birds will be limited. However, considering that Woodward *et al*. [31]outlines that there is, to some degree, potential connectivity with pink-footed goose, LSE cannot be excluded.

d Changes to Prey Availability and Behaviour

The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.

e In-combination Effects

Given that effect pathways to LSE exists for pink-footed goose, the potential for in-combination effects with other plans and projects remains.

3.48 Loch Ashie SPA

Table 3-48: LSE Matrix for migratory waterbird features of Loch Ashie SPA

Distance from Project							**149 km from ECC; 336 km from Array Area**								
Feature	**Vessel disturbance**			**Distributional responses**			**Collision risk**			**Changes in prey availability and behaviour**			**In-combination effects**		
	C	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**
Slavonian grebe	Xa	Xa			Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe

a Vessel Disturbance

Slavonian grebe from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.

b Distributional Responses

Slavonian grebe from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.

c Collision Risk

The MSS strategic assessment report concluded that at a strategic level, the populations of non-seabird species which pass through Scottish waters do not appear to be at risk of significant levels of additional mortality due to collisions with Scottish offshore windfarms.

It is however evident the number of offshore wind projects and therefore the number of WTGs has increased notably since the publication of the MSS report. An update to the collision risk for migrating birds in Scottish waters was completed by the British Trust for Ornithology in 2023[22]. A CRM specifically for migratory birds is not currently available and Woodward *et al*. [3131]outline the scope of a stochastic tool that will be part of a subsequent work package.

The Array Area is considerably offshore, located approximately 185 km offshore east of Aberdeen, and it is considered likely that interactions with migratory birds will be limited. However, considering that Woodward *et al*. [31]outlines that there is, to some degree, potential connectivity with Slavonian grebe, LSE cannot be excluded.

d Changes to Prey Availability and Behaviour

The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.

e In-combination Effects

Given that effect pathways to LSE exists for collision risk for Slavonian grebe, the potential for in-combination effects with other plans and projects remains.

3.49 South Tayside Goose Roosts SPA/Ramsar site

Table 3-49: LSE Matrix for migratory waterbird features of South Tayside Goose Roosts SPA/Ramsar site

Distance from Project							162 km from ECC; 306 km from Array Area								
Feature	Vessel disturbance			Distributional responses			Collision risk			Changes in prey availability and behaviour			In-combination effects		
	C	OM	D	C	OM	D	C	OM	D	C	OM	D	C	OM	D
Wigeon (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Pink-footed goose (non-breeding)	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Greylag goose (non-breeding)	Xa	Xa	Xa		Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe
Waterbird assemblage (non-breeding)*	Xa	Xa	Xa		Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe

*Note that where one of the above potential pathways to LSE exist for a component feature, by definition it also exists for the wider qualifying non-breeding waterbird assemblage.

a Vessel Disturbance

The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.

b Distributional Responses

The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.

c Collision Risk

The MSS strategic assessment report concluded that at a strategic level, the populations of non-seabird species which pass through Scottish waters do not appear to be at risk of significant levels of additional mortality due to collisions with Scottish offshore windfarms.

It is however evident the number of offshore wind projects and therefore the number of WTGs has increased notably since the publication of the MSS report. An update to the collision risk for migrating birds in Scottish waters was completed by the British Trust for Ornithology in 2023[22]. A CRM specifically for migratory birds is not currently available and Woodward *et al*. [3131]outline the scope of a stochastic tool that will be part of a subsequent work package.

The Array Area is considerably offshore, located approximately 185 km offshore east of Aberdeen, and it is considered likely that interactions with migratory birds will be limited. However, considering that Woodward *et al*. [31]outlines that there is, to some degree, potential connectivity with migratory pink footed goose and wigeon, LSE cannot be excluded. There is considered to be no connectivity with greylag goose migratory routes and LSE is excluded. .

d Changes to Prey Availability and Behaviour

The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.

e In-combination Effects

Given that effect pathways to LSE exists for collision risk on wigeon and pink-footed goose, the potential for in-combination effects with other plans and projects remains. No effect pathways have been identified for greylag goose and therefore there is no potential for contribution to in-combination effects.

3.50 Loch Leven SPA/Ramsar site

Table 3-50: LSE Matrix for migratory waterbird features of Loch Leven SPA/Ramsar site

Distance from Project							167 km from ECC; 299 km from Array Area								
Feature	**Vessel disturbance**			**Distributional responses**			**Collision risk**			**Changes in prey availability and behaviour**			**In-combination effects**		
	C	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**
Whooper swan (non-breeding)	Xa	Xa			Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Pink-footed goose (non-breeding)	Xa	Xa			Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Shoveler (non-breeding)	Xa	Xa			Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Cormorant (non-breeding)	Xa	Xa			Xb			Xc		Xd	Xd	Xd	Xe	✓e	Xe
Gadwall (non-breeding)	Xa	Xa			Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Teal (non-breeding)	Xa	Xa			Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Pochard (non-breeding)	Xa	Xa			Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Tufted duck (non-breeding)	Xa	Xa			Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Goldeneye (non-breeding)	Xa	Xa			Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Waterbird assemblage (non-breeding)*	Xa	Xa			Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe

*Note that where one of the above potential pathways to LSE exist for a component feature, by definition it also exists for the wider qualifying non-breeding waterbird assemblage.

a Vessel Disturbance

The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.

b Distributional Responses

The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.

c Collision Risk

The MSS strategic assessment report concluded that at a strategic level, the populations of non-seabird species which pass through Scottish waters do not appear to be at risk of significant levels of additional mortality due to collisions with Scottish offshore windfarms.

It is however evident the number of offshore wind projects and therefore the number of WTGs has increased notably since the publication of the MSS report. An update to the collision risk for migrating birds in Scottish waters was completed by the British Trust for Ornithology in 2023[22]. A CRM specifically for migratory birds is not currently available and Woodward *et al*. [3131]outline the scope of a stochastic tool that will be part of a subsequent work package.

The Array Area is considerably offshore, located approximately 185 km offshore east of Aberdeen, and it is considered likely that interactions with migratory birds will be limited. However, considering that Woodward *et al*. [31]outlines that there is, to some degree, potential connectivity with all qualifying features except for cormorant. LSE cannot be excluded.

d Changes to Prey Availability and Behaviour

The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.

e In-combination Effects

Given that effect pathways to LSE exists for collision risk on all qualifying features, except for cormorant, the potential for in-combination effects with other plans and projects remains. No effect pathways have been identified for cormorant and therefore there is no potential for contribution to in-combination effects.

3.51 East Sanday Coast SPA/Ramsar site

Table 3-51: LSE Matrix for migratory waterbird features of East Sanday Coast SPA/Ramsar site

Distance from Project							192 km from ECC; 316 km from Array Area								
Feature	**Vessel disturbance**			**Distributional responses**			**Collision risk**			**Changes in prey availability and behaviour**			**In-combination effects**		
	C	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**
Bar-tailed godwit (non-breeding)	Xa	Xa			Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Purple sandpiper (non-breeding)	Xa	Xa			Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Turnstone (non-breeding)	Xa	Xa			Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe

a Vessel Disturbance

The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.

b Distributional Responses

The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.

c Collision Risk

The MSS strategic assessment report concluded that at a strategic level, the populations of non-seabird species which pass through Scottish waters do not appear to be at risk of significant levels of additional mortality due to collisions with Scottish offshore windfarms.

It is however evident the number of offshore wind projects and therefore the number of WTGs has increased notably since the publication of the MSS report. An update to the collision risk for migrating birds in Scottish waters was completed by the British Trust for Ornithology in 2023[22]. A CRM specifically for migratory birds is not currently available and Woodward *et al*. [31]outline the scope of a stochastic tool that will be part of a subsequent work package.

The Array Area is considerably offshore, located approximately 185 km offshore east of Aberdeen, and it is considered likely that interactions with migratory birds will be limited. However, considering that Woodward *et al*. [31]outlines that there is, to some degree, potential connectivity with all qualifying features, LSE cannot be excluded.

d Changes to prey availability and Behaviour

The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.

e In-combination Effects

Given that effect pathways to LSE exists for collision risk on all qualifying features, the potential for in-combination effects with other plans and projects remain.

3.52 Greenlaw Moor SPA/Ramsar site

Table 3-52: LSE Matrix for marine ornithological features of Greenlaw Moor SPA/Ramsar site

Distance from Project							195 km from ECC; 272 km from Array Area								
Feature	Vessel disturbance			Distributional responses			Collision risk			Changes in prey availability and behaviour			In-combination effects		
	C	OM	D	C	OM	D	C	OM	D	C	OM	D	C	OM	D
Pink-footed goose (non-breeding)	Xa	Xa			Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe

a Vessel Disturbance

Pink-footed goose from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.

b Distributional Responses

Pink-footed goose from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.

c Collision Risk

The MSS strategic assessment report concluded that at a strategic level, the populations of non-seabird species which pass through Scottish waters do not appear to be at risk of significant levels of additional mortality due to collisions with Scottish offshore windfarms.

It is however evident the number of offshore wind projects and therefore the number of WTGs has increased notably since the publication of the MSS report. An update to the collision risk for migrating birds in Scottish waters was completed by the British Trust for Ornithology in 2023[22]. A CRM specifically for migratory birds is not currently available and Woodward *et al*. [3131]outline the scope of a stochastic tool that will be part of a subsequent work package.

The Array Area is considerably offshore, located approximately 185 km offshore east of Aberdeen, and it is considered likely that interactions with migratory birds will be limited. However, considering that Woodward *et al*. [31] outlines that there is, to some degree, potential connectivity with migratory pink-footed goose, LSE cannot be excluded.

d Changes to Prey Availability and Behaviour

The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.

e In-combination Effects

Given that effect pathways to LSE exists for collision risk for pink-footed goose, the potential for in-combination effects with other plans and projects remains.

3.53 Din Moss – Hoselaw Loch SPA/Ramsar site

Table 3-53: LSE Matrix for marine ornithological features of Din Moss – Hoselaw Loch SPA/Ramsar site

Distance from Project	210 km from ECC; 276 km from Array Area														
Feature	**Vessel disturbance**			**Distributional responses**			**Collision risk**			**Changes in prey availability and behaviour**			**In-combination effects**		
	C	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**	**C**	**OM**	**D**
Pink-footed goose (non-breeding)	Xa	Xa			Xb			✓c		Xd	Xd	Xd	Xe	✓e	Xe
Greylag goose (non-breeding)	Xa	Xa			Xb			Xc		Xd	Xd	Xd	Xe	Xe	Xe

a Vessel Disturbance

The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.

b Distributional Responses

The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.

c Collision Risk

The MSS strategic assessment report concluded that at a strategic level, the populations of non-seabird species which pass through Scottish waters do not appear to be at risk of significant levels of additional mortality due to collisions with Scottish offshore windfarms.

It is however evident the number of offshore wind projects and therefore the number of WTGs has increased notably since the publication of the MSS report. An update to the collision risk for migrating birds in Scottish waters was completed by the British Trust for Ornithology in 2023[22]. A CRM specifically for migratory birds is not currently available and Woodward *et al*.[3131] outline the scope of a stochastic tool that will be part of a subsequent work package.

The Array Area is located approximately 185 km offshore east of Aberdeen, and it is considered likely that interactions with migratory birds will be limited. However, considering that Woodward *et al*.[31] outlines that there is, to some degree, potential connectivity with migratory pink-footed goose, LSE cannot be excluded. There is considered to be no connectivity with greylag goose migratory routes and LSE is excluded.

d Changes to Prey Availability and Behaviour

The migratory waterbirds from this SPA will not utilise habitat in the marine environment for foraging and therefore will be unaffected by this impact. LSE can be excluded.

e In-combination effects

Given that effect pathways to LSE exists for collision risk for pink-footed goose, the potential for in-combination effects with other plans and projects remains. No effect pathways have been identified for greylag goose and therefore there is no potential for contribution to in-combination effects.

3.54 References

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