Havbredey Offshore Wind Farm

Offshore Project Habitats Regulations Appraisal Screening

1 April 2025

Havbredey Offshore Wind Farm

Offshore Project Habitats Regulations Appraisal Screening

Document No.: HVB-NPI-ENV-RPT-0002
Rev.: 1
Approval Date: 2025.04.01

Information about this revision:

Revision Number	Reason For Issue	Author	Reviewer	Approver
1	Final for submission	ERM	SM/CL	MW/AQ

Glossary

Term	Definition
Array Area	The area as identified by the blue line boundary in Figure 1.2-1 in which the wind turbine generators (WTGs), associated moorings and anchors, the dynamic and static inter-array cables and offshore platform structures (as required) are located.
Landfall Area of Search	The area of the Offshore Cable Corridor Area of Search as identified by the green line boundary in Figure 1.2-2, that interacts with the coastline.
Offshore Cable Corridor Area of Search	An area of search in which the offshore export cable and reactive compensation stations (RCSs) (if required) are located between Array Area and Landfall Area of Search as identified by the red line boundary in Figure 1.2-1.
Offshore Project	The offshore elements of the Project.
Onshore Project	The onshore elements of the Project.
Plan Option	Areas identified in the first Scotwind Leasing round by Crown Estate Scotland. For the Havbredey floating Offshore Wind Farm this was 'N2'.
the Applicant	Havbredey Limited (Company Number SC717714).
the Project	The full proposal for the Havbredey floating Offshore Wind Farm, encompassing the Offshore Project and all onshore works.

Acronyms

Abbreviation	Definition
AA	Appropriate Assessment
AEOSI	Adverse Effect On Site Integrity
ALAN	Artificial Light at Night
B-field	Magnetic field
DAS	Digital Aerial Surveys
EC	European Committee
E-field	Electric Field
EIAR	Environmental Impact Assessment Report
EMF	Electromagnetic Fields
ESB	Electricity Supply Board
EU	European Union
FLOW	Floating Offshore Wind Farm
HRA	Habitats Regulations Appraisal
INNS	Invasive Non-Native Species
IROPI	Imperative Reasons of Overriding Public Interest
JNCC	Joint Nature Conservation Committee
km	Kilometres
LSE	Likely Significant Effects
MHWS	Mean High Water Springs
MLWS	Mean Low Water Springs
MMMU	Marine Mammal Management Units
MSL	Mean Sea Level
HDD	Horizontal Directional Drilling
HVAC	High-Voltage Alternating Current
HVDC	High-Voltage Direct Current
NPP	Nuclear Power Plant
NRS	Nuclear Restoration Services
OSPs	Offshore Substation Platform(s)
OWF	Offshore Wind Farm
O&M	Operation and Maintenance
P2X	Power to X

Abbreviation	Definition
PAH	Polycyclic Aromatic Hydrocarbon
PDE	Project Design Envelope
RCSs	Reactive Compensation Station(s)
RIAA	Report to Inform Appropriate Assessment
SAC	Special Areas of Conservation
SMU	Seal Management Unit
SOSS	Strategic Ornithological Support Services
SOSS-MAT	Strategic Ornithological Support Services Migration Assessment Tool
SPA	Special Protection Areas
SSC	Suspended Sediment Concentration
UK	United Kingdom
UXO	Unexploded Ordnance
WTG	Wind Turbine Generator

Contents

1. INTRODUCTION

1.1. PROJECT BACKGROUND

In early 2022, as part of the ScotWind bidding round, the Applicant was successfully awarded an Option Agreement to develop an offshore wind farm (OWF) within the N2 Plan Option area located approximately 27 km offshore to the northwest of Cape Wrath, Scotland. The proposed floating offshore wind farm (FLOW) is named 'Havbredey'; the Norse meaning of the name translates to 'Isles on the edge of the sea', inspired by Scottish and Nordic folklore.

The offshore infrastructure up to mean high water springs (MHWS) includes wind turbine generators (WTGs) and associated moorings and anchors, dynamic and static inter-array cables, offshore substation platform(s) (OSPs) and RCSs with associated foundations, and offshore export cables with associated cable protection where necessary.

The Applicant is the company that owns the Offshore Project (i.e., Havbredey Limited). Northland Power Inc. ('Northland') is the indirect owner of 75.5% of the share capital in the Applicant and Electricity Supply Board (ESB) indirectly owns (24.5%) of the remaining capital of the Offshore Project. The Applicant is seeking to develop a FLOW project with a 35-year consent period, utilising up to 110 floating WTGs, with a potential generating capacity of 1,500 MW. The Offshore Project is expected to have a point of connection to the grid in the vicinity of the Landfall Area of Search but is awaiting confirmation via the Offshore Transmission Network Review and National Grid Holistic Network Design Follow Up Exercise. The Array Area is approximately 391 km^2 in size; water depths across the Array Area range from 75-116 m, making the site well suited to floating foundations. Further details of the Offshore Project are provided in Section 2: Project Description.

1.2. PURPOSE OF THIS REPORT

This report presents the screening exercise of the Offshore Project (i.e. offshore elements of the proposed Havbredey FLOW) Habitats Regulations Appraisal (HRA). It provides information to support HRA screening for Likely Significant Effect (LSE) on European Sites[1] and Ramsar sites that could be affected by the Offshore Project. Following the UK's exit from the EU, European sites within UK territorial waters are no longer part of

[1] The term European Site is used to refer to any site over which the provisions of the Regulations exert an influence. These include: fully designated Special Areas of Conservation (SACs); Sites of Community Importance (SCIs); Candidate SACs, i.e. sites submitted as eligible for SCI status but not yet entered as an SCI (until such time as the Appropriate Authority notifies the Statutory Nature Conservation Body that it does not intend to designated that site); and Special Protection Areas (SPAs). UK policy is that the following sites should also be considered in the same way as European Sites: potential SPAs; possible/proposed SACs; listed and proposed Ramsar sites; areas secured as compensating for damage to a European Site.

the European Union's Natura 2000 network. Instead, they form a UK-wide network of protected sites 'UK National Network' sites (further detail provided in Section 3.1.1). References throughout this report to a 'UK National Network' site are to be read as also including non-UK sites within the EU's Natura 2000 network.

The HRA process comprises 3 main stages as shown in the bullet points below (UK Gov, 2021) as based on Articles 6.3 (Stages 1 and 2) and 6.4 (Stage 3) of Council Directive 92/43/EEC, the 'Habitats Directive'[2]). The stages are:

- Stage 1: Screening to identify whether the Offshore Project is likely to be significant on the site's conservation objectives (alone or in combination)
- Stage 2: Appropriate Assessment (AA) to assess the LSE of the proposal in more detail and identify ways to avoid or minimise any effects
- Stage 3: Derogation to consider if proposals that would have an adverse effect on a UK National Network site qualify for an exemption. This contains 2 substages - assessment of alternative solutions to establish if there are any that will result in a lesser effect on the National Network Site and Imperative Reasons of Overriding Public Interest (IROPI). Satisfaction of IROPI is associated with identification of compensatory measures appropriate to maintain the coherence of the European/UK national site network in light of the predicted adverse effects

All 3 stages of the process are referred to collectively as the HRA. The stages are discussed in more detail in the following sections. The potential need for Stage 3 will result from consideration of the AA.

This report constitutes Stage 1 Screening, where LSEs are identified and reported. Within this report, any pressure pathway for which significant effect cannot be excluded on the basis of objective evidence has been classed as LSE and screened into Stage 2 AA.

The Offshore Project HRA covers effects associated with Offshore Project activities, i.e. those seaward of MHWS. A separate Onshore Project HRA process will be completed for the onshore elements (landward of mean low water springs (MLWS), i.e. the Onshore Project). Potential interactions between effects associated with the Offshore Project and those associated with the Onshore Project will be considered within in combination assessment where appropriate.

It should be noted that the present assessment is based on the best available information at the time of reporting. Should additional information become available on baseline environment, Offshore Project parameters, relevant guidance, or consultation comments, this may result in amendments to the approach to or outcomes of HRA screening. In such cases, any changes will be discussed with NatureScot and the Marine Directorate.

[2] HRA also refers to assessment processes for the Birds Directive, Council Directive 2009/147/EC

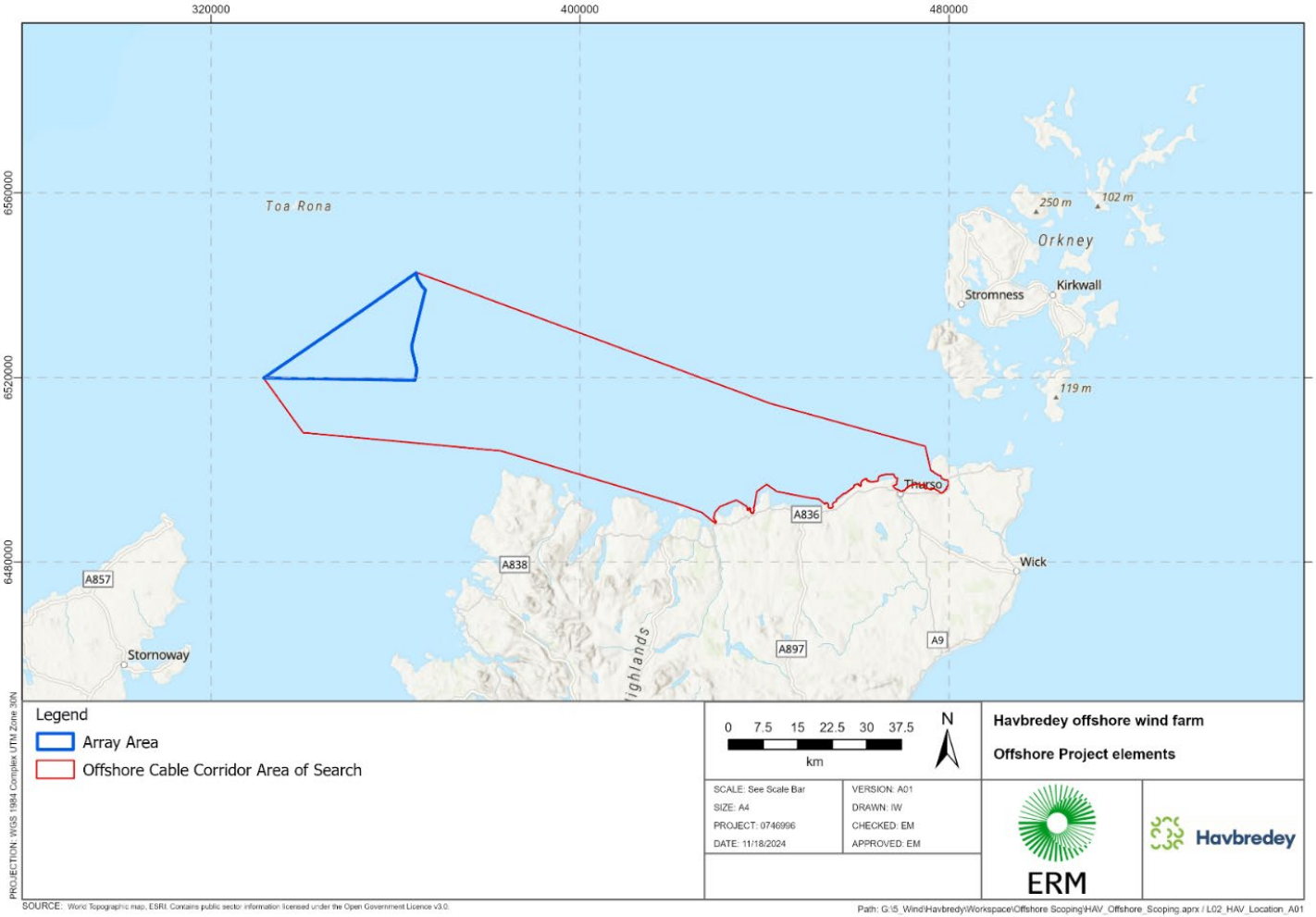

Figure 1.2-1 Project Overview

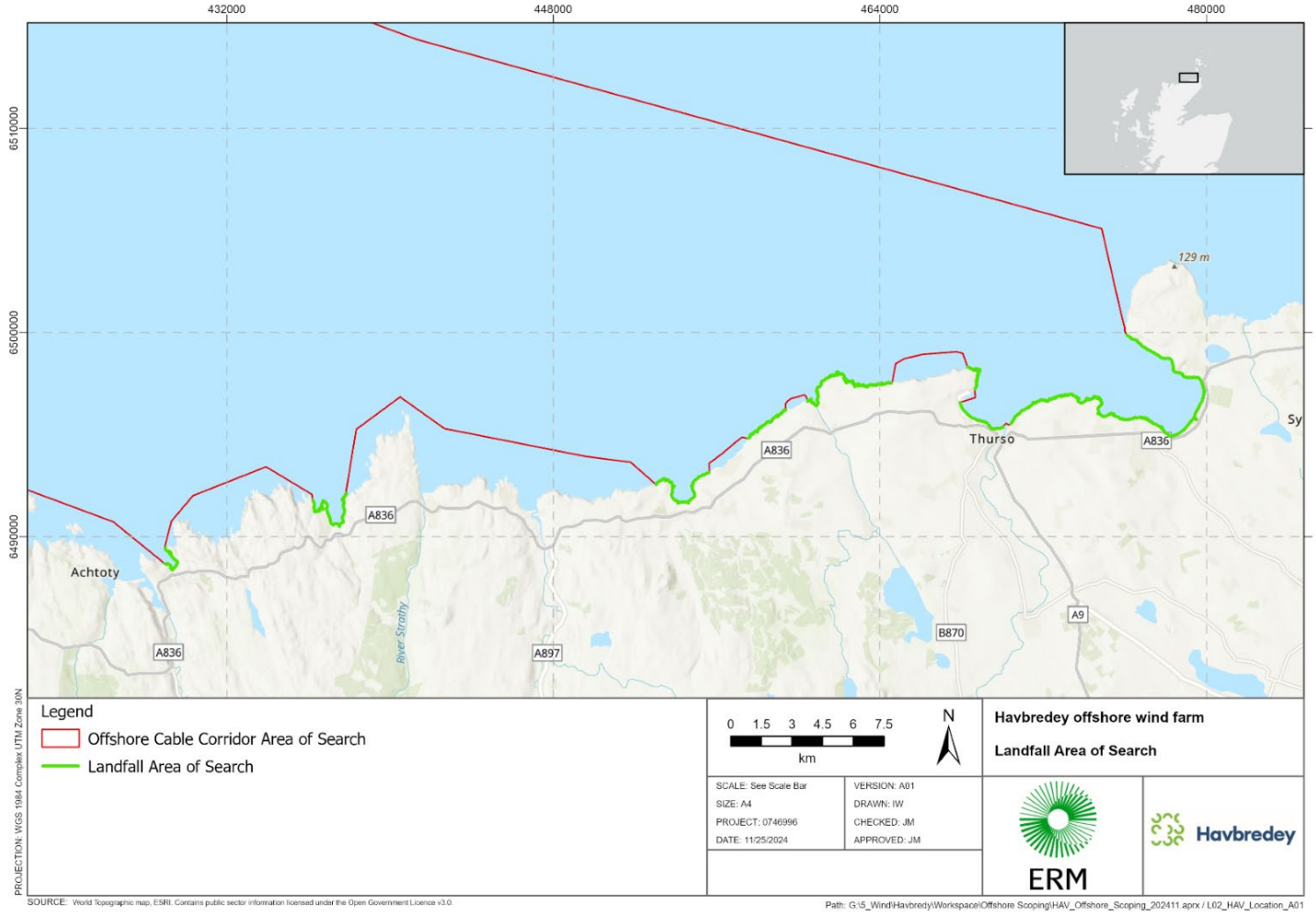

Figure 1.2-2 The Landfall Area of Search (the area of the Offshore Cable Corridor Area of Search that interacts with the coastline)

2. Project Description

2.1. Introduction

This section of the Offshore Project HRA Screening Report provides a summary of the project design envelope (PDE) and describes the activities associated with the construction, operation and maintenance, and decommissioning of the Offshore Project. Further details on each of the elements of the Offshore Project are provided in the Project Description chapter of the Offshore Scoping Report.

2.2. Wind Turbine Generators

Up to 110 WTGs are proposed to be utilised within the Offshore Project, each comprising of three rotor blades, a nacelle housing the generating unit, hub and a tower section. The iterative wind farm layout process will determine the final number of WTGs to be constructed, based on the capacity of individual WTGs used and site-specific survey results.

The Offshore Scoping PDE values for the WTGs are presented in Table 2.2-1.

Table 2.2-1 Offshore Scoping PDE Parameters for WTGs

Parameter	Value
Number of WTGs	Up to 110
WTG blade tip height above MSL	Up to 385 m
WTG rotor diameter	Up to 330 m
WTG air gap (between minimum blade tip height and MSL)	22 m or greater
WTG hub height above MSL	Up to 220 m
Spacing between individual WTGs	900 m or greater

2.3. Floating Substructure, Mooring System and Anchor Types

Up to 110 floating substructures are proposed, alongside the maximum proposed number of individual WTGs. A range of substructure types are proposed for use and will be considered, including semi-submersible (steel/concrete material), tension-leg platform (steel material) and barge (steel/concrete material). The exact substructure type to be used will not be confirmed until the design of the Offshore Project has been finalised.

A range of mooring systems are proposed for use within the Offshore Project, including catenary, semi-taut, taut and tension systems. For each of the mooring systems, 3-9 mooring lines per floating substructure are proposed for use, with a range of mooring line lengths and a range of mooring clump weights per mooring line associated with each mooring system type.

Similarly, a range of anchor types are being considered within the Offshore Project, including drag-embedment, vertically loaded, driven pile, drilled and grouted pile, suction caisson and gravity. The exact anchor type to be used will not be confirmed until the design of the Offshore Project has been finalised, in order to accommodate for ground conditions and the loads imparted by the final selected mooring configuration.

The Offshore Scoping PDE values for the floating substructure, mooring system and anchor types are presented in Table 2.3-1.

Table 2.3-1 Offshore Scoping PDE Parameters for Floating Foundations, Mooring System and Anchor Types

Parameter	Value
Floating Foundations	
Floating foundation type	Semi-submersible, tension-leg platform, barge
Number of floating substructures	Up to 110
Sea surface footprint per foundation type	Semi-submersible: 6,000 - 11,200 m^2, tension-leg platform: 4,500 - 5,250 m^2, barge: 4,255 - 7,225 m^2
Height above MSL (min – max range)	Semi-submersible: 20 - 25 m, tension-leg platform: 20 – 25 m, barge: 10 – 15 m
Mooring System	
Number of mooring lines (per floating substructure) (min – max range)	3 - 9
Installation methods	Catenary, semi-taut, taut, tension
Anchor Types	
Anchor methods	Drag-embedment, vertically loaded, driven pile, drilled and grouted pile, suction caisson, gravity

2.4. Offshore Substation Platform(s)

A maximum of 3 OSPs are proposed to be developed within the Array Area, alongside a maximum of 3 RCSs (if required) along the export cable route. The OSP(s) comprise 2 main components: (1) a substructure foundation; and (2) a topside. The substructure foundation will likely be a large jacket structure, which will

be fixed to the seabed typically through piles, suction caisson, gravity base, or monopile, depending on the size of the OSP, ground conditions and water depth.

The Offshore Scoping PDE values for the OSPs are presented in Table 2.4-1.

Table 2.4-1 Offshore Scoping PDE Parameters for OSPs

Parameter	Value
Number of platforms	Up to 3 OSPs within the Array Area Up to 3 RCSs along the export cable route
Height above LAT	Up to 70 m
Topside dimensions (length x width)	Up to 144 m x 85 m
Seabed footprint	Up to 110 m^2
Foundation type	Fixed (Jacket or Monopile)

2.5. P2X Technology

The use of technology to convert electricity ('power' or 'P') generated from WTGs into other ('2') forms of energy or products ('X') may be included as part of the Offshore Project. The inclusion of structures containing P2X technology is intended to allow for future innovations, such as offshore storage, with anticipated infrastructure comprising an additional jacket and platform. While specifics are currently unavailable, it is assumed the footprint will be similar to an OSP, and any required assessment and consenting will follow relevant guidance and legislation in place at that time.

2.6. Inter-Array Cables, Interconnector Cables, and Offshore Export Cables

The number of inter-array cables utilised within the Array Area will vary depending on the wind farm size, WTG capacities and electrical design options taken forward. However, for the Offshore Project, up to 110 inter-array cables ('strings') plus additional cables for back links (if required) could be used, including both static and dynamic cables. The exact route of the inter-array cables has not yet been defined, as these will be determined during the finalisation of the wind farm layout design process.

Up to 2 interconnector cables are currently proposed for use within the Offshore Project with up to 40 km in total length and will be buried where possible.

Up to 6 offshore export cables are proposed to make landfall within the Landfall Area of Search. High-voltage direct current (HVDC) and high-voltage alternating current (HVAC) technologies are both being considered for the Offshore Project. The nominal voltage along the offshore export cables will be 220-

275 kV for HVAC or ±525 kV for HVDC. The maximum individual cable diameters for all offshore export cables are proposed to be up to 330 mm, with a total length of cable trenches up to 810 km.

The Offshore Scoping PDE values for the inter-array cables, interconnector cables and offshore export cables are presented in Table 2.6-1.

Table 2.6-1 Offshore Scoping PDE Parameters for Inter-Array Cables, Interconnector Cables, and Offshore Export Cables

Parameter	Value
Inter-array cables	
Number of cables	Up to 110 plus additional cable back links if required
Voltage	66 or 132 kV
Total length	Up to 22 km for dynamic, up to 3.9 km for static
Total burial depth	Up to 2 m
Size of cable corridor (length x width)	Up to 3,900 m x 100 m per cable
Total length of cable trenches	Up to 430 km
Interconnector cables	
Number of interconnector cables	Up to 2
Total length of interconnector cables	Up to 40 km
Width of direct seabed footprint from cable installation (per cable)	Up to 15 m
Target burial depth	Up to 2 m
Trench depth	Up to 2 m
Width of cable trench	Up to 2 m
Size of cable stabilisation protection (height x width)	Up to 3 m x 5 m
Offshore export cables	
Transmission system	HVDC or HVAC
Number of cables	Up to 6
Voltage	220-275 kV for HVAC or ±525 kV for HVDC
Cable corridor size (length x width)	Up to 135 km x 2.5 km
Width of direct seabed disturbance during installation (per cable)	Up to 20 m
Target cable burial depth (min – max range)	1-5 m

2.7. Landfall

Exact landfall location(s) have not yet been defined but will be within the defined Landfall Area of Search. Site-specific surveys will inform the finalised landfall location. The Offshore Project is currently proposed to make landfall between Bettyhill and Dunnet Bay, on the north coast of mainland Scotland.

The Offshore Scoping PDE values for landfall are presented in Table 2.7-1.

Table 2.7-1 Offshore Scoping PDE Parameters for Landfall

Parameter	Value
Number of export cables making landfall	Up to 6
Landfall installation method	Open cut or trenchless (e.g. horizontal directional drilling (HDD))

2.8. Offshore Construction Programme

Construction activities associated with the Offshore Project is planned to occur over a period of 5 years, and include the following activities:

- Pre-construction surveys and site investigations
- Site preparation
- OSP and RCS installation (including foundations)
- Offshore export cable installation – landfall and offshore (and interconnector cable(s) if required)
- Anchor and mooring installation
- Floating WTG installation, including floating substructures
- Inter-array cable installation
- WTG installation/commissioning

2.9. Operation and Maintenance Phase

The overall Operation and Maintenance (O&M) strategy will be finalised once the project design is finalised. The following classifications of maintenance may be required during the O&M phase:

- Routine maintenance activities
- Unscheduled maintenance
- Major component replacement/repair

All offshore infrastructure, including WTGs, floating substructures and associated mooring and anchor systems, cables and OSPs (and RCS if required), will be included in monitoring and maintenance programmes. The potential impacts of maintenance activities (including planned, unplanned, and major component) will be assessed, based on both experience and best practice.

2.10. Decommissioning Phase

The Energy Act (2004) contains statutory requirements in relation to the decommissioning of offshore renewable energy installations and requires the Offshore Project to provide a Decommissioning Programme supported by appropriate financial security prior to construction.

The guidance outlined in the Guidance Notes on Decommissioning of Offshore Renewable Energy Installations in Scottish waters or in the Scottish part of the Renewable Energy Zone under the Energy Act 2004, will be followed by the Decommissioning Programme. Associated decommissioning activities will comply with all relevant legislation at that time. The Environmental Impact Assessment Report (EIAR) will provide an overview of the anticipated decommissioning events and an assessment of the LSEs of this phase on receptors.

3. Overview of the Habitats Regulations Appraisal Process

3.1. Habitats Regulations Appraisal Process and the United Kingdom's Exit from the European Union

The Conservation (Natural Habitats, &c.) Regulations 1994 as amended[3], The Conservation of Habitats and Species Regulations 2017 (as amended)[4], and The Conservation of Offshore Marine Habitats and Species Regulations 2017[5] (as amended), (together the 'Habitats Regulations') transpose the European Union (EU) Habitats Directive (Council Directive 92/43/EEC)[6] and certain elements of the Wild Birds Directive (Directive 2009/147/EC)[7] (known together as the Nature Directives), into United Kingdom (UK) and Scottish law.

The Conservation (Natural Habitats, &c.) Regulations 1994 as amended apply on land in Scotland, and in Scottish inshore waters (the area of sea adjacent to Scotland from 0 to 12 nautical miles). The Conservation

[3] https://www.legislation.gov.uk/uksi/1994/2716/contents/made
[4] https://www.legislation.gov.uk/uksi/2017/1012/contents/made
[5] https://www.legislation.gov.uk/uksi/2017/1013/contents/made
[6] Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A31992L0043
[7] Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32009L0147

of Habitats and Species Regulations 2017 apply to specific reserved and devolved activities on land in Scotland, and in Scottish inshore waters, including for consents under sections 36 and 37 of the Electricity Act 1989. The Conservation of Offshore Marine Habitats and Species Regulations 2017 apply to all UK offshore waters (the area of sea beyond 12 nautical miles).

Following the UK's exit from the European Union, and the end of the transition period on 31 December 2020, legislation has been passed to transfer functions from the European Commission to the appropriate authorities in the UK[8] and Scotland[9]. While references in an EU context throughout the legislation have been re-defined to a UK only context, overall, the legislative changes do not result in material changes in how HRAs are undertaken in the UK. Habitat and species protection and standards will be implemented in the same or an equivalent way, maintaining existing protections for habitats and species. The environmental assessment regimes that inform planning decisions, including HRA, continue to apply post-EU exit. Existing guidance including the guidance published by the European Commission should continue to have effect (See Annex 2, EU Exit: The Habitats Regulations in Scotland (December 2020)).

3.1.1. Habitats Regulations Site Designations

European sites, European marine sites and European offshore marine sites (together 'European Sites[1]') in the UK (as defined by the Conservation (Natural Habitats, &c.) Regulations 1994, and the Conservation of Offshore Marine Habitats and Species Regulations 2017) are no longer part of the European Union's Natura 2000 network. Instead, they form a UK-wide network of protected sites. All European Sites retain the same level of protection now that the UK has left the European Union. However, the Conservation of Habitats and Species Regulations 2017 and the Conservation of Offshore Marine Habitats and Species Regulations 2017 now provide for the creation of a 'UK National Network' within the UK territory. This is comprised of the European Sites already designated under the Nature Directives (Natura 2000 Network), and any further sites designated under these Regulations. Appropriate management objectives will be established for the National Network (the 'network objectives').

References throughout this report to a 'UK National Network' site are to be read as also including non-UK sites within the EU's Natura 2000 network.

3.1.2. Stage 1 – Screening and determination of likely significant effect

The screening stage examines the likely effects of a project either alone, or in combination with other projects and plans on a UK National Network site. Sites designated under the Habitats Directive are called Special Areas of Conservation (SACs), and those designated under the Birds Directive are Special Protection Areas (SPAs). Ramsar sites (designated under the Conservation on Wetlands of International Importance

[8] https://www.legislation.gov.uk/uksi/2019/579/contents/made
[9] https://www.legislation.gov.uk/ssi/2019/113/contents/made

(the 'Ramsar Convention') are also included in this HRA Screening Report. The screening stage seeks to answer the question "*can it be concluded that no likely significant effect will occur*?". To determine if it cannot be excluded on the basis of objective evidence that the construction, operation, maintenance, and/or decommissioning of the Proposed Development will have any significant effects on the designated sites, the issues listed below have been considered:

- Could the proposals affect the qualifying feature and are they sensitive/vulnerable to the effect?
- The probability of the effect happening
- The likely consequences for the site's conservation objectives if the effect occurred
- The magnitude, duration, and reversibility of the effect, considering any mitigation built into the proposed development design

The screening stage will therefore conclude one of the outcomes listed below:

- No LSE
- A LSE will occur
- It cannot be concluded that there will be no LSE

Where the assessment concludes the second or third outcome, and as the Offshore Project is not directly connected to the management of any UK National Network site, then the need for an AA is triggered[10]. Natural England's[11] internal guidance (Natural England Internal Guidance, 2018) states, in paragraphs 4.3 to 4.5, that:

4.3 "In undertaking an assessment of 'likely significant effects' under the Habitats Regulations, authoritative case law has established that:

- *an effect is likely if it "cannot be excluded on the basis of objective information."* (Case C-127-02 Waddenzee – refer para 45)
- *an effect is significant if it "is likely to undermine the conservation objectives."* (Case C-127-02 Waddenzee – refer para 48)
- *in undertaking a screening assessment for likely significant effects "…it is not that significant effects are probable, a risk is sufficient" but there must be credible evidence that there is "a real, rather than a*

[10] In the case of the third outcome, European guidance (Assessment of Plans and Projects Significantly affecting Natura 2000 sites (2001)) advises that sufficient uncertainty remains to indicate that an Appropriate Assessment should be carried out.

[11] Natural England guidance used herein due to an absence of an equivalent publication from NatureScot. However, this is considered an appropriate resource for assessments carried out for Scottish projects as the information presented is limited to details of the HRA process as set out by EC regulations and case law.

hypothetical, risk." (Boggis v Natural England and Waveney DC (2009) EWCA Civ 1061 – refer paras 36-37)

4.4 The Advocate General's opinion in Sweetman also offers some simple guidance that the screening step 'operates merely as a trigger' which asks, "should we bother to check?" (Case C-258/11 Sweetman Advocate General Opinion (refer to paragraphs 49-50)).

4.5 As such, when determining whether air pollution from a plan or project has a "likely significant effect" upon a given qualifying feature under the Habitats Regulations, "the extent to which there are risks of air pollution that might undermine the conservation objectives for the site is central".

Recent case law has also confirmed that mitigation measures should not be considered at the screening stage (C-323/17 People over Wind). Such matters are to be considered as part of an AA. However, from an air quality perspective, the assessment does consider the embedded measures that are required to meet emission limits and air quality standards designed for the protection of human health. Recent case law (Case C-721/21 Eco Advocacy CLG v An Bord Pleanála) highlighted that account could be taken of features where they are incorporated into a plan/project as standard features, irrespective of the effect they have on the UK National Network site (e.g. standard measures to remove contaminants, which may reduce harmful effects on a UK National Network site).

The screening assessment also must include a consideration of other projects and whether LSEs on a UK National Network site may result in combination with these other projects. In drawing up the list of other projects and plans, account will be taken also of the need to avoid "legislative overkill" that could occur through the inclusion of "… all plans and projects capable of having any effect whatsoever…" (Case C-258/11 Sweetman v An Board Pleanála (2013))[12] and that there is credible evidence that the risk from these other projects and plans is real (see reference to Boggis above). This will include consideration of the likely effects of the project/plans on the conservation objectives of the UK National Network site(s) affected.

3.1.3. Stage 2 – Appropriate Assessment

Where an AA is required, its aim is to determine if the effects of a project will have an adverse effect on UK National Network sites. It should provide and analyse sufficient information to allow the competent authority to make this determination. AA should focus exclusively on the qualifying features of the UK National Network site and consider any effects on the conservation objectives of those qualifying features. It should also be based on, and supported by, evidence that stands up to scientific scrutiny. EC guidance states that without proper reasoning the assessment does not fulfil its purpose and cannot be considered *"appropriate"* and, therefore, cannot be consented. In terms of what is reasonable, guidance states *"to*

[12] In Case C 258/11

identify the potential risks, so far as they may be reasonably foreseeable in the light of such information as can be reasonably obtained" (European Communities, 2000).

The AA contains two stages as listed below:

- A scientific evaluation of all the LSEs of a project alone, or in combination with other projects, on the relevant qualifying features of a UK National Network site;
- A conclusion, based on outcomes of the scientific evaluation, as to whether there will be an adverse effect on the integrity of a UK National Network site.

The AA will need to determine whether adverse effects due to a project will occur that would have an adverse effect on a UK National Network site's conservation integrity. Site integrity can be defined as *"the coherence of its structure and function across its whole area that enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it was classified"* (EC, 2000).

The assessment also needs to consider any measures which will be implemented to avoid or reduce the level of impact from a project. The competent authority may also consider the use of conditions or restrictions to help avoid adverse effects on site integrity.

If the AA concludes that there will be an adverse effect on the integrity of the UK National Network site, or that there is uncertainty and a precautionary approach is taken, then consent can only be granted if there are no alternative solutions, IROPI are demonstrated, and compensatory measures have been secured.

The AA is typically informed by a Report to Inform Appropriate Assessment (RIAA).

4. Approach to HRA Screening

4.1. Identification of Relevant Sites

Screening has been conducted through a two staged approach. The first stage considers potential for connectivity between pressures associated with Offshore Project activities and qualifying features within the UK National Site Network. This involves application of search criteria that account for precautionary predictions of effect ranges associated with the proposed works, and the ecology and distribution of qualifying features. These criteria are outlined in Table 4.1-1. The second stage of screening provides a more detailed consideration of the sites for which connectivity has been established. Where there is objective evidence that the construction and/or operation of the Offshore Project will not have any significant effects on the designated sites, i.e. there is no potential impact pathway or the predicted effects associated with a specific pathway are considered to be trivial, the corresponding site may be screened out

of further consideration within AA. Where it is not possible to exclude the possibility of significant effects, sites are taken forward for further consideration.

Table 4.1-1 Distances Used in the Screening of UK National Network Sites. Unless Otherwise Stated, All Buffers Are Applied to the Offshore Project Boundary as Shown in Figure 1.2-1.

Receptor	Screening Methodology
Annex I Benthic Habitats	**10 km** screening buffer. This buffer is expected to exceed the maximum distance of sediment plume effects (suspended sediment, deposition and smothering) and hydrodynamic effects (wave and tidal current) on benthic habitats and species.
Annex II Migratory Fish	**25 km** screening buffer. This buffer is considered sufficient to ensure that there is no measurable habitat loss or barrier to species movement arising from the project activities.
Annex II Pinniped Species	**20 km** screening buffer for grey seal *Halichoerus grypus* based on NatureScot advice[13].
	50 km screening buffer for harbour seal *Phoca vitulina* based on foraging ranges for pinnipeds determined in accordance with SCOS (2022).
Annex II Marine Mammals	For this receptor group Marine Mammal Management Units (MMMU) have been used (as defined by IAMMWG, 2023).
Classified Bird Populations and Ramsar Sites	**Species-specific Foraging Ranges (2.7 to 2,365.5 km)** (Woodward *et al.*, 2019; NatureScot, 2023) have been applied to the Array Area boundary as a buffer to identify all SPA and/or Ramsar site breeding colonies with potential connectivity. **15 km** screening buffer has been applied to identify connectivity between non-breeding seabird features (e.g. Caithness Lochs SPA) and entirely marine SPAs and/or Ramsar sites which are classified only for foraging areas for marine birds (e.g. the Irish Sea Front SPA).

[13] NatureScot advised to screen in SACs for assessment if the Offshore Project site/impact radius is within 20 km of SACs designated for grey seal. Although grey seals can and do forage considerable distances, the Conservation Objectives for grey seal SACs are related to the protection of the breeding colony. During this sensitive time, grey seals (especially females) do not travel further than about 20 km.

Receptor	Screening Methodology
	15 km screening buffer has been applied to identify potential connectivity with intertidal features or species with highly coastal distributions, such as geese, ducks, and waders. **50 km** screening buffer has been applied to the Offshore Cable Corridor Area of Search to identify potential connectivity. This buffer has been applied to ensure key sites within the vicinity are appropriately considered whilst also taking into account the smaller magnitude and scale of effect expected within this area. Interaction with migratory bird populations has been identified through the British Trust for Ornithology (BTO)'s Strategic Ornithological Support Services (SOSS) Migration Assessment Tool (SOSS-MAT) (Wright *et al.*, 2012), where a threshold of 1% of possible migration lines is used for screening (refer to Section 8.3.12). Where this threshold is met, SPAs and Ramsar Sites are identified through manual review.

4.2. Approach to In Combination Assessment

Where the screening for the Offshore Project alone has identified a potential for LSE, it is assumed that there is also potential for this effect to combine with that of other plans or projects, to result in an in combination LSE. However, given the precautionary approach that has been taken to determine where LSE cannot be excluded, it is possible that pressure pathways will be taken forward to AA, only for it to be established that there is no potential for connectivity. In such cases, this will be noted within the relevant section of the project alone assessment within the AA, and this pressure pathway will be screened out of the in combination assessment.

5. Screening for Annex I Benthic Habitats

Based on the criteria described in Table 4.1-1 for screening of UK National Network sites with Annex I qualifying features, connectivity was established for the sites detailed in Table 4.2-1. The location of these sites relative to the Offshore Project is shown in Figure 5.2-1.

Table 4.2-1 UK National Network Sites Designated for Annex I Habitats and Satisfying the Criteria for Connectivity with Offshore Project Activities, As Set Out in Table 4.1-1. Location of Sites Relative to the Offshore Project is Illustrated in Figure 5.2-1.

Site Name	Annex I Habitat	Distance to Array Area (km)	Distance to Offshore Cable Corridor Area of Search (km)
Durness SAC	▪ Fixed coastal dunes with herbaceous vegetation ("grey dunes")*† ▪ Hard oligo-mesotrophic waters with benthic vegetation of Chara spp.* ▪ Alpine and subalpine calcareous grasslands* ▪ Limestone pavements*† ▪ Shifting dunes along the shoreline with Ammophila arenaria ("white dunes") ▪ Humid dune slacks ▪ Northern Atlantic wet heaths with *Erica tetralix* ▪ European dry heaths ▪ Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels ▪ Alkaline fens	38.74	2.23
Solan Bank Reef SAC	▪ Reefs*	4.94	0

** Primary reason for selection*

† Priority feature

5.1. Durness SAC

The Durness SAC is located 2.23 km from the Offshore Cable Corridor Area of Search, on the north Sutherland coast, immediately west of Durness. This site is a coastal terrestrial site which does not extend below MHWS. As such, it is determined there is no connectivity between Offshore Project activities and

Annex I habitat features of the Durness SAC, and no LSE is determined for Offshore Project effects, either alone or in combination with other plans or projects.

Consideration of Onshore Project activities and potential for these to impact terrestrial UK National Network Sites will be considered within the Onshore HRA Screening.

5.2. Solan Bank Reef SAC

The Solan Bank Reef SAC lies across both Scottish territorial and offshore waters. As such, this site is jointly managed by NatureScot and the Joint Nature Conservation Committee (JNCC). It is designated for the presence of Annex I Reef features. Reef within this site comprises high to medium topographic complexity geogenic structures (JNCC, 2009).

The range of depth zonations (infralittoral to deep circalittoral) and associated energy conditions support a variety of benthic community types. These include encrusting bryozoans, encrusting coralline algae, caryophyllid cup corals and ophiuroids. Shallower areas with increased water flow contain the soft coral, *Alcyonium digitatum*, the cup coral, *Caryophyllia smithii* and the jewel anemone, *Corynactis viridis*, with red algae and kelp in the shallowest areas (JNCC, 2024).

Consideration has been given to the following pressures, identified as presenting potential pathways to LSE to Annex I habitat features of the Solan Bank Reef SAC from Offshore Project activities:

Pre-construction, construction and decommissioning phases*

- Abrasion/disturbance of the substrate on the surface of the seabed
- Penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion
- Physical change (to another sediment type)
- Changes in suspended solids (water clarity)
- Smothering and siltation rate changes
- Hydrocarbon & polycyclic aromatic hydrocarbon (PAH) contamination
- Introduction or spread of invasive non-native species (INNS)
- Water flow (tidal current) changes, including sediment transport considerations

**Where pressures are applicable to a specific Offshore Project phase, this will be stated in the sections below. Where no reference is made to the Offshore Project stage, it should be understood that the pressure applies to all phases.*

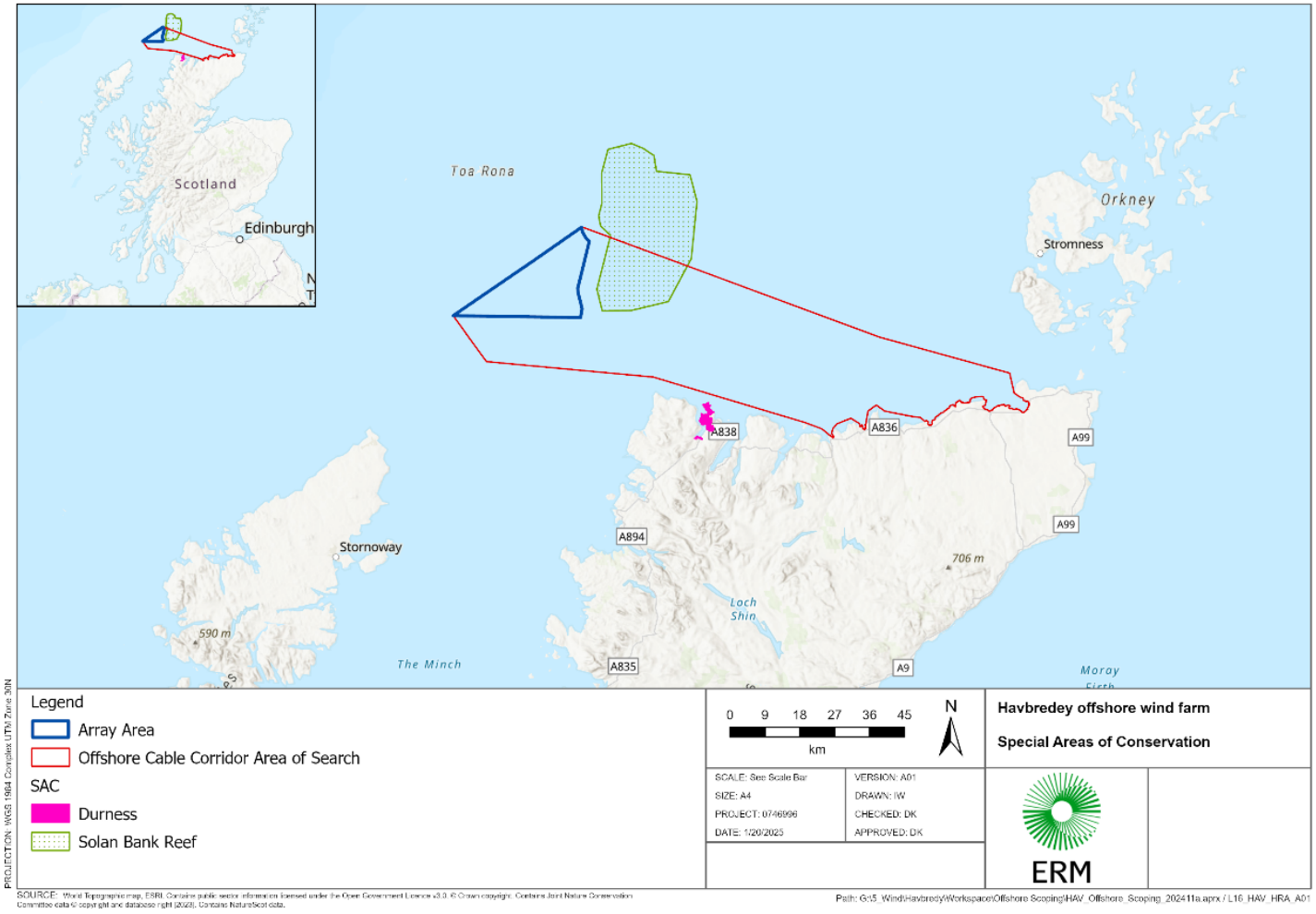

Figure 5.2-1 Location of SAC Sites with Annex I Habitats Listed as Qualifying Features, Where Connectivity was Established with the Offshore Project.

Operation and maintenance phase*

- Abrasion/disturbance of the substrate on the surface of the seabed
- Penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion
- Physical change (to another sediment type)
- Changes in suspended solids (water clarity)
- Smothering and siltation rate changes
- Hydrocarbon & PAH contamination
- Introduction or spread of INNS
- Water flow (tidal current) changes, including sediment transport considerations
- Effects of electromagnetic fields (EMF)

**Where pressures are applicable to a specific Offshore Project phase, this will be stated in the sections below. Where no reference is made to the Offshore Project stage, it should be understood that the pressure applies to all phases.*

5.2.1. Disturbance

This section considers the following pressures:

- Abrasion/disturbance of the substrate on the surface of the seabed
- Penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion

Subtidal seabed disturbance may occur as a result of direct disturbance during burial of inter-array or export cables (installation methods such as but not limited to ploughing, jetting, cutting, and controlled flow excavation). However, it should be acknowledged that the Array Area is 4.94 km from the Solan Bank Reef SAC. As such, only indirect pathways exist for effects on this site from activities within the Array Area; works associated with the offshore array will therefore not be considered for the pressures listed above. Appraisal of indirect effects such as deposition of mobilised sediment is provided in Section 5.2.3.

The Offshore Cable Corridor Area of Search intersects the Solan Bank Reef SAC; therefore, cable installation, O&M and decommissioning activities may directly affect designated features of this site. Direct habitat disturbance may alter suitability for characterising species, which could result in displacement of typical species, or introduction and establishment of previously absent species or communities.

The Offshore Cable Corridor Area of Search extends for approximately 20 km across the Solan Bank Reef SAC. The maximum width of seabed disturbance during installation (per cable) is 20 m, and up to 6 cables are proposed. Accordingly, there is potential for disturbance of up to 2.4 km² of designated seabed habitat.

This estimate is likely to be highly precautionary as it is based on the assumption that there would be no overlap in areas of disturbance.

Annex I reef habitat within the Solan Bank SAC is not considered sensitive to 'penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion'. Reef within this area is geogenic in nature and cables will only be buried where there are soft sediment types. Areas of reef may be affected by deposition of protective material require to ensure asset integrity in this area; however, that is addressed in Section 5.2.2, below. It is therefore concluded that penetration or disturbance below the surface will not result in LSE for effects of the Offshore Project alone or in combination. However, in view of the spatial overlap between Offshore Project construction activities and the Solan Bank Reef SAC, it is not possible to rule out LSE on Annex I reef habitat within this site, either alone or in combination with other plans or projects due to abrasion/disturbance of the substrate on the surface of the seabed.

5.2.2. Change of habitat type

This section considers the following pressure:

- Physical change (to another sediment type)

Change of habitat type may occur due to cable stabilisation protection methods, such as but not limited to rock placement, mattressing, and deposition of grout bags or rock bags. The hard compact nature of these structures means there is a degree of similarity with the designated reef habitat present within the Solan Bank Reef SAC; however, specific habitat conditions will differ from those naturally present within the site, and as such this change may alter suitability for benthic communities.

At this early stage of project development, it is not possible to state the spatial extent of cable protection that is expected to be required. However, more detailed engineering studies will be available as the Offshore Project design matures which will be fed into the RIAA. In view of the spatial overlap between Offshore Cable Corridor Area of Search and the Solan Bank Reef SAC, it is not possible to rule out LSE on Annex I reef habitat from Offshore Project effects, either alone or in combination with other plans or projects.

5.2.3. Sediment Mobilisation and Deposition

This section considers the following pressures:

- Changes in suspended solids (water clarity)
- Smothering and siltation rate changes

The Offshore Project activities during all phases are associated with potential for sediment mobilisation and deposition. Although the only component of the Offshore Project that overlaps with the Solan Bank Reef SAC is the Offshore Cable Corridor Area of Search, qualifying features of this site may be indirectly affected

by sediment plumes. As such, consideration of sediment mobilisation and deposition must account for all Offshore Project activities. Sediment mobilisation may occur due to burial of inter-array or export cables (installation methods included ploughing, jetting, cutting, and controlled flow excavation), anchor placement, construction or decommissioning of the offshore substation, or due to disturbance associated with movement of mooring lines.

In the Array Area, there are limited means for marine process driven resuspension and transport of seabed sediment, due to the weak tidal currents (0.4 m/s; ABPmer, 2008) and deep-water depths (which restrict interaction with wave action). This limits the incidence of resuspension and transportation to extreme weather events, such as storms. This conclusion is supported by the low levels of suspended sediment identified within the region (Scottish continental shelf) throughout all seasons (<2 mg/l) (Cefas, 2016). However, seabed disturbance arising from construction, operation and maintenance, or decommissioning activities (such as but not limited to cable laying and anchor placement, or movement of mooring lines) may cause adverse effects on benthic communities as these are expected to cause an increase in suspended sediment concentration (SSC). This will increase water column turbidity and result in increased siltation and the potential for smothering of sessile fauna and/or clogging of their feeding apparatus. Whilst this may not constitute a direct effect on Annex I reef *structures*, it does introduce potential for impacts on characterising communities.

In view of the spatial overlap between the Solan Bank Reef SAC and the Offshore Cable Corridor Area of Search, and potential interaction between this site and sediment plumes caused by activities carried out within the Array Area, it is not possible to rule out LSE on Annex I reef habitat within this site from Offshore Project effects, either alone or in combination with other plans or projects.

5.2.4. CONTAMINATION

This section considers the following pressures:

- Hydrocarbon & PAH contamination
- Introduction or spread of INNS
- Accidental release of pollutants

There is potential that activities which cause seabed disturbance, such as but not limited to cable installation, could mobilise sediments containing chemical contaminants, thereby introducing these substances into the wider marine environment. However, there is no oil and gas activity known to have occurred within the vicinity of the Array Area and Offshore Cable Corridor Area of Search (NSTA, 2024). There is 1 small open dredge spoil deposit site (FI008: Scrabster Extension) and 3 closed sites (FI002: Dounreay Microsite; FI005: Scrabster; and FI010: Thurso) within the Offshore Cable Corridor Area of Search (Scottish Government, 2024). FI002, FI005, and FI008 are disposal sites associated with the now

decommissioned Nuclear Restoration Services (NRS) Dounreay Nuclear Power Plant (NPP). Due to nature of NPP-related dredge disposal, there is potential for the presence of radioactive contaminants at these disposal sites. Remobilisation of contaminated sediments can result in contamination of the water column and other areas where sediment may deposit. It should be noted that chemical testing is performed prior to dredging and disposal at these sites to ensure sediment does not contain unacceptable levels of chemical contaminants. Given the geographic separation between this site and the Solan Bank SAC (>85 km) it is considered there is negligible risk that any associated contaminants that are present could be mobilised and affect this site. Therefore, the risk of contaminated sediments being present within the Array Area and Offshore Cable Corridor Area of Search are low and as such no LSE is concluded for the release of contaminants through mobilisation of contaminated sediments due to Offshore Project effects, either alone or in combination.

Potential also exists for accidental release of chemicals from works vessels, such as diesel oil, sewage, or antifouling substances applied to works vessels. These substances may contaminate benthic communities present on designated reef features within the Solan Bank Reef SAC. Toxic effects that may potentially result from this include reduction in benthic abundance, biomass, and/or diversity. The Applicant will implement various designed in mitigation measures to reduce the likelihood of such pollution events. These will be described in more detail within the RIAA.

In additional to chemical contamination, there is also potential for the Offshore Project to result in biological contamination, via the introduction or spread of marine INNS. Increased vessel activity during construction and decommissioning phases will be associated with risk of introduction of INNS into the area. The Offshore Project is located away from large ports, and as such, it is likely that any introduction of INNS would constitute an expansion of their range. Industry best standard will be followed to reduce the risk of introducing or spreading invasive species. These will be discussed in more detail within the RIAA.

There is additional potential for accidental release of chemicals from works vessels, such as diesel oil, sewage, or antifouling substances applied to works vessels. These substances may contaminate benthic communities targeted by harbour porpoise during foraging activities. The Applicant will implement various designed in mitigation measures to reduce the likelihood of such pollution events. These will be discussed in more detail within the RIAA.

In view of the risk that the presence of works vessels may lead to the introduction of chemical contaminants, or INNS, it is not possible to rule out LSE from these pressures on Annex I reef habitat from Offshore Project effects, either alone or in combination with other plans or projects. However, due to the low likelihood of contamination within seabed sediments, no LSE is concluded for potential introduction of chemical contaminants into the marine environment through mobilisation of contaminated sediments.

5.2.5. Impacts on Hydrological Conditions

This section considers the following pressure:

- Water flow (tidal current) changes, including sediment transport considerations

Potential effects generated by the presence of Offshore Project infrastructure during O&M activities (e.g. anchors, scour protection, and mooring lines) may cause changes that may create a pathway to impact morphological features. However, this is expected to be limited to localised scouring, and the predominate seabed sediment type along the Offshore Cable Corridor Area of Search is coarse grained sediment, which is less likely to become resuspended and swept away.

It is considered that the geogenic reef features of the Solan Bank SAC are not sensitive to scour effects. Changes in hydrological regime may cause changes in patterns of sediment deposition, but this would not lead to burial of reef features due to the paucity of sediment cover in this area.

Floating and above seabed structures may affect the tidal regime. However, the structures themselves occupy a small fraction of the water column and therefore do not represent a barrier to or cause a drag on the propagation of the tidal wave. Thus, the structures will not change the tidal range, locally, or mean tidal velocities either locally or further afield. There is the possibility that the structures will enhance localised mixing within the water column and thereby change sediment transport and impact sediment transport or suspended sediment concentrations. However, changes are expected to be small in magnitude, and designated Annex I geogenic reef structures within the Solan Bank Reef SAC are not considered sensitive to changes in sediment transport.

In view of the low risk of changes to hydrological conditions affecting seabed morphology, and low sensitivity of Annex I geogenic reefs to any changes that may occur, LSE on Annex I reef habitat within this site is ruled out from Offshore Project effects either alone and in combination with other plans or projects.

5.2.6. Electromagnetic Fields (EMF)

This section considers the following pressure:

- Effects of EMF

The presence of electrical transmission infrastructure within the marine environment will produce both an electric field (E-field) and a magnetic field (B-field) when in operation. These are collectively referred to as an EMF. Subsea cables are insulated to prevent E-fields from interacting with the environment; accordingly, EMF within the marine environment consists solely of the B-field. The strength of EMF is dependent on the electric current strength through the cable and reduces with perpendicular distance away from the cable.

The effects of EMF on benthic communities are poorly understood and most habitats lack assessments in sensitivity assessment tools such as FeAST and MarESA. Laboratory studies have provided evidence of

physiological and behaviour responses to increased EMF levels (Hutchison *et al.*, 2020; Jakubowska *et al.*, 2019). However, these studies have been carried out under EMF levels considerably higher than those that would occur *in situ* (>2,000 µT; Bochert and Zettler, 2006, Jakubowska-Lehrmann et al., 2022). Some studies have reported effects of EMF values closer to those predicted to occur at offshore wind transmission cables (~750 µT); for instance, the ragworm *Hediste diversicolor* showed no avoidance or attraction to EMF at 1,000 µT but burrowing activity was enhanced (Jakubowska *et al.*, 2019). This elevated rate of burrowing did not affect energy consumption or respiration rate, although rates of ammonia excretion were significantly reduced in exposed animals. No differences in the valve activity and filtration rate were reported for blue mussel *Mytilus edulis* exposed to 300 µT (Albert *et al.*, 2022). However, subtle exploratory responses have been shown in American lobster *Homarus americanus* in response to EMF at 65.3 µT (Hutchinson *et al.*, 2020b).

Given the research to date show negligible levels of effect on benthic communities from EMF, and the localised extent of the fields themselves, no LSE is concluded for EMF on Annex I benthic communities from Offshore Project effects, either alone or in combination.

5.2.7. SUMMARY

Table 5.2-1 provides a summary of the conclusions drawn in Sections 5.2.1-5.2.6.

Table 5.2-1 Determination of LSE for Annex I Benthic Habitats Listed as Qualifying Features for the Solan Bank SAC.

Pressure	Project Stage	Screening Outcome
Abrasion/disturbance of the substrate on the surface of the seabed	Construction	LSE
	Operation and Maintenance	
	Decommissioning	
Penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion	Construction	LSE
	Operation and Maintenance	
	Decommissioning	
Physical change (to another sediment type)	Construction	LSE
	Operation and Maintenance	
	Decommissioning	

Pressure	Project Stage	Screening Outcome
Changes in suspended solids (water clarity)	Construction	LSE
	Operation and Maintenance	
	Decommissioning	
Smothering and siltation rate changes	Construction	LSE
	Operation and Maintenance	
	Decommissioning	
Hydrocarbon & PAH contamination	Construction	LSE concluded for accidental pollution events. No LSE concluded for the release of contaminants through mobilisation of contaminated sediments.
	Operation and Maintenance	
	Decommissioning	
Introduction or spread of INNS	Construction	LSE
	Operation and Maintenance	
	Decommissioning	
Water flow (tidal current) changes, including sediment transport considerations	Construction	No LSE
	Operation and Maintenance	
	Decommissioning	
EMF	Construction	No LSE
	Operation and Maintenance	
	Decommissioning	

6. Screening for Annex II Migratory Fish Species

No UK National Network sites designated for migratory fish species were identified through consideration of the distance criteria detailed in Table 4.1-1 (i.e. there are no designated nature conservation sites for migratory fish species within 25 km of the Offshore Project). There is potential for connectivity between Offshore Project activities and more distant UK National Network sites that have Annex II migratory fish species as qualifying species. This is due to the high mobility of diadromous fishes within the marine environment, both when migrating as smolts from rivers to marine feeding grounds, or when adults return to natal rivers to spawn. However, in accordance with previous NatureScot advice, it is considered that there is currently insufficient understanding of where migratory fish (Atlantic salmon, sea trout and sea and river lamprey) go within marine waters and connectivity back to natal rivers to understand connectivity to and within individual rivers to the development area. This uncertainty precludes informed assessment of potential impact on individual designated site integrity. As such, it is determined that these populations will be assessed through Environmental Impact Assessment only and not through HRA.

7. Screening for Annex II Marine Mammal Species

Annex II of the EU Habitats Directive (92/43/ECC) lists animal and plant species of community interest whose conservation requires the designation of Special Areas of Conservation. The following Annex II mammal species are known to be present within Scottish waters and will therefore be considered within the screening assessment:

- Grey seal *Halichoerus grypus*
- Harbour seal *Phoca vitulina*
- Harbour porpoise *Phocoena phocoena*
- Bottlenose dolphin *Tursiops truncatus*
- European otter *Lutra lutra*

Assessment of connectivity within the following sections is carried out in accordance with the criteria set out in Table 4.1-1.

Site-specific digital aerial surveys (DAS) have been successfully executed monthly since March 2023, with data available from March 2023 to February 2024 at the time of writing. The DAS data have been used to inform the species summaries presented below. The second year of DAS data (March 2024 – February 2025) will be available and analysed to inform the RIAA.

7.1. Bottlenose Dolphin

The closest UK National Network site to the Offshore Project that has bottlenose dolphin as a qualifying feature is the Moray Firth SAC (straight line distances of 126.68 km from the Array Area, and 68.02 km from the Offshore Cable Corridor Area of Search). No bottlenose dolphin sightings have been reported in Offshore Project DAS. However, 1 sighting was recorded within the Spiorad na Mara DAS and 1 recorded in the West of Orkney DAS. As such, it is concluded that the Offshore Project does constitute habitat used by designated bottlenose dolphin populations. Given their absence from the area, it is considered there is no evidence to suggest that activities at this site could impact these animals.

This absence from site-specific DAS observations aligns with data from SCANS-IV surveys; the 2022 surveys did not report any bottlenose dolphin sightings off the north Scotland coast (Gilles *et al.,* 2022). SCANS-IV reports a bottlenose dolphin density (animals/km^2) of 0.3421 and an abundance of 4,784 in the Minch, off the west coast of Scotland (block CS-H).

Given this lack of connectivity between the location of the Offshore Project and designated bottlenose dolphin populations, LSE can be excluded for all Offshore Project activities to all UK National Network sites within UK bottlenose dolphin management units, either alone or in combination with other plans and projects

7.2. Harbour Porpoise

As detailed in Table 4.1-1, connectivity between Offshore Project activities and populations of designated Annex II marine mammal populations was determined through consideration of the relevant species specific management unit. For harbour porpoise, the Array Area lies within the West Scotland management unit. The Offshore Cable Corridor Area of Search passes eastward, with the most easterly area being located within the North Sea management unit. As such, the initial search for sites where there may be connectivity includes all sites which list harbour porpoise as a qualifying feature, and that are located in either the West Scotland or the North Sea management unit (see APPENDIX A).

Of the sites identified within the North Sea management unit, the closest to the Offshore Project footprint is the Southern North Sea SAC, located 428.95 km from the Offshore Cable Corridor Area of Search. The only part of the Offshore Project footprint that extends into the North Sea management unit is the Offshore Cable Corridor Area of Search; the spatial extent of pressures associated with cable installation, O&M, and decommissioning activities are all relatively small. Given the large geographic separation between Offshore Project activities and the SACs located within the North Sea management unit (>400 km) and the relatively small zone of influence for pressures associated with cable installation activities, no LSE is concluded for all sites located within this management unit for Offshore Project activities, either alone or in combination with other plans and projects.

Within the West Scotland management unit connectivity was established for the sites detailed in Table 7.2-1. The location of these sites relative to the Offshore Project is shown in Figure 7.2-1.

Table 7.2-1 UK National Network Sites Within the West Scotland Management Unit and With Harbour Porpoise as a Qualifying Feature.

Site Name	Annex II Species	Distance to Array Area (km)	Distance to Offshore Cable Corridor Area of Search (km)
Inner Hebrides and the Minches SAC	Harbour Porpoise	41.95	51.25
Skerries and Causeway SAC	Harbour Porpoise	392.25	391.40

The Skerries and Causeway SAC is located >390 km from the Offshore Project, suggesting that the Offshore Project site is unlikely to constitute an important area or foraging ground for designated harbour porpoise populations of this this SAC. Nevertheless, given its location within the West Scotland management unit there remains theoretical risk of effect on some individuals associated with this site from Offshore Project activities, particularly in terms of effects in combination with other plans and projects. To take account of the considerable geographic separation between the Offshore Project and the Skerries and Causeway SAC, whilst retaining a proportional assessment, it is proposed that an iterative approach is adopted. This will involve the RIAA initially making assessment of the closest site to the Offshore Project footprint (i.e. Inner Hebrides and the Minches SAC). If an Adverse Effect On Site Integrity (AEOSI) is determined, then additional assessment will be carried out for the next closest site (i.e. the Skerries and Causeway SAC). If no AEOSI was determined, this more distant site will not be considered further.

Harbour porpoise are present in Scottish waters throughout the year. Several surveys have provided data on presence in waters local to the Offshore Project, including:

- DAS for West of Orkney Offshore Windfarm over a period from July 2020 to June 2022 (HiDef, 2023)
- DAS for Pentland FLOW (HiDef, 2015; HiDef, 2016; HiDef, 2021)
- DAS for Spiorad na Mara over 12 months (commenced March 2022)
- SCANS-IV aerial and shipboard surveys (Gilles *et al.*, 2023)
- Abundance estimates for the relevant MUs (IAMMWG, 2023)

- Offshore Project specific DAS over twelve months (March 2023 – February 2024), providing site-specific survey counts (APEM, 2024)

Results from these surveys are presented in Table 7.2-2.

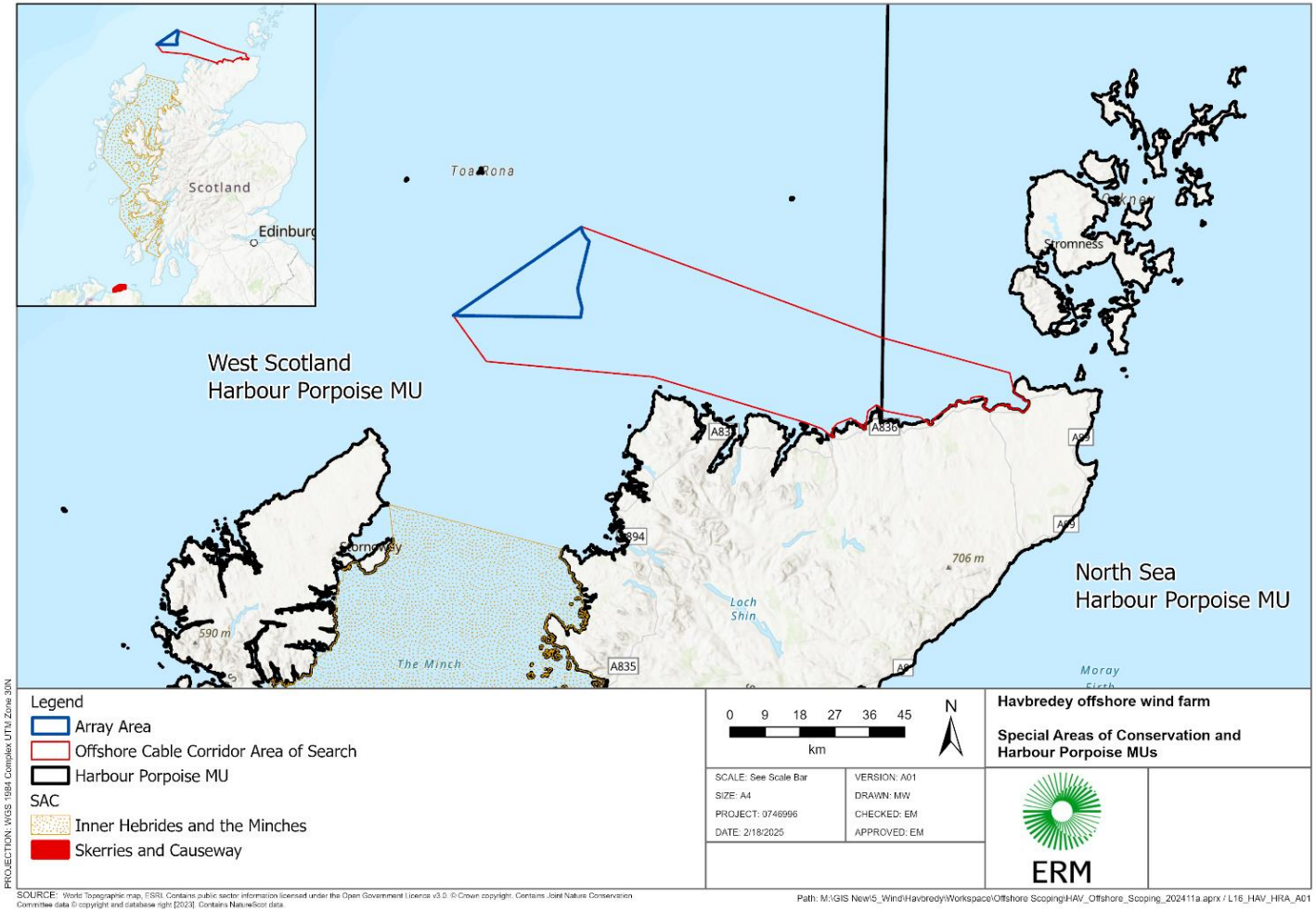

Figure 7.2-1 Location of SAC Sites with Annex II Marine Mammal Species Listed as Qualifying Features, Where Connectivity was Established with the Offshore Project

Table 7.2-2 Abundance and Density of Harbour Porpoise in the Vicinity of the Offshore Project

Species	Offshore Project specific DAS*	Spiorad na Mara DAS †	DAS: West of Orkney ‡		DAS: Pentland FLOW §			Gilles et al., 2023 Density (animals/km^2) ||		IAMMWG, 2022 Abundance and Management Unit
			July 2020 – June 2021	July 2021 – June 2022	2015	2016	2021*	Block CS-H	Block CS-J	
Harbour porpoise *Phocoena phocoena*	90	60	46	78	3	12	24	Density: 0.3911 Abundance: 5,470	Density: 0.0994 Abundance: 3,231	West Scotland: 28,936 (UK section 24,305)

** total count (March 2023- February 2024) (APEM, 2024)*

† total count (March 2022 – February 2023)

§ HiDef, 2015; HiDef, 2016; HiDef, 2021

Consideration has been given to the following pressures, identified as presenting potential pathways to LSE to Annex II harbour porpoise populations of the sites listed in Table 7.2-1, from Offshore Project activities:

Pre-construction, construction and decommissioning phases*

- Injury or disturbance from subsea acoustic emissions
- Indirect effects from changes in availability or distribution of prey species
- Effects of habitat change on foraging activities
- Vessel collision
- Entanglement
- Changes in suspended solids (water clarity)
- Accidental release of pollutants
- Barrier to species movement

Operation and maintenance phase*

- Injury or disturbance from subsea acoustic emissions
- Indirect effects from changes in availability or distribution of prey species
- Effects of habitat change on foraging activities
- Vessel collision
- Entanglement
- Changes in suspended solids (water clarity)
- Accidental release of pollutants
- Barrier to species movement
- EMF

**Where pressures are applicable to a specific Offshore Project phase, this will be stated in the sections below. Where no reference is made to the Offshore Project stage, it should be understood that the pressure applies to all phases.*

7.2.1. Food Resource

This section considers the following pressures:

- Indirect effects from changes in availability or distribution of prey species
- Effects of habitat change on foraging activities
- Changes in suspended solids (water clarity)

Subtidal seabed disturbance may occur as a result of direct disturbance during burial of inter-array or export cables (installation methods included ploughing, jetting, cutting, and controlled flow excavation), the

operation of jack-up vessels, anchor installation, or within the mooring line swept area. The duration of effect for these activities ranges from short term temporary (e.g. habitat damage caused by cable installation within soft seabed sediments) to long term temporary (e.g. seabed disturbance within the mooring line swept area) and is likely to reoccur regularly due to line movement; as such this should be considered an ongoing impact for the entire Offshore Project lifetime (expected 35 years).

In addition, where cable protection is required during the construction or O&M phases, this would be associated with habitat change or loss. Where this occurs over areas of soft or mixed sediment types this change will be long term (expected project duration of 35 years). Where additional solid material is placed on existing rocky habitat it may be possible for this to be colonised by similar communities to those present within the baseline environment; however, it is likely this recovery period would extend over a period of years.

All of these activities would lead to direct disturbance or damage, which may alter habitat suitability for characterising species. This could result in displacement of typical species, or introduction and establishment of previously absent species or communities. Such changes may potentially impact availability of prey species targeted by harbour porpoise during foraging.

The Offshore Cable Corridor Area of Search extends for 135 km, and the maximum width of potential seabed disturbance is 20 m per cable. Given that up to 6 cables will be installed, this could be associated with up to 16.2 km² of seabed disturbance. It should be noted that this value is considered to be precautionary, as it assumes that there would be no overlap in extent of disturbance for each of these 6 cables. The worst-case footprint for anchor structures is associated with gravity base anchors. If these were used, it is predicted that there would be up to 900 m² of seabed habitat change/loss per anchor.

At this early stage of project development, it is not possible to state the spatial extent of cable protection that is expected to be required. However, more detailed engineering studies will be available as the Offshore Project design matures which will be fed into the RIAA. In addition, details of mooring line swept area is not currently known but will also be incorporated in detailed RIAA.

Offshore Project activities during all phases are associated with potential for sediment mobilisation, which would increase turbidity, thereby potentially disturbing foraging of visual cue led foraging species. However, due to the use of echolocation by harbour porpoise, the species is not considered sensitive to these changes in turbidity.

Key prey species for marine mammals include various fish species such as Atlantic herring, Atlantic cod, whiting, flatfish species and sandeel. As such, adverse impacts on fish communities may have indirect effects on marine mammal species through reductions in prey availability.

As outlined in the Offshore Project Scoping Report, fish and shellfish populations may be affected through the following impact pathways:

- Temporary seabed habitat loss and/or disturbance
- Increases in suspended sediment concentration
- Reduction in water quality due to the release of contaminants from seabed sediment disturbance
- Underwater noise and vibration
- Permanent seabed habitat loss/disturbance
- EMF effects from cables
- Fish and shellfish aggregation effects due to the presence of infrastructure in the water column and on the seabed
- Ghost fishing due to the presence of lost fishing gear entangled/snagged by infrastructure

Although these demonstrate impact pathways on fish and shellfish receptor groups, the potential loss of prey as a result of the Offshore Project would be expected to be minimal relative to the amount of alternative feeding resource available within the wider foraging areas of Annex II harbour porpoise considered within assessment. The fish community in the area surrounding the Offshore Project is considered to be representative of other areas along the north Scotland coast, and as such effects from the Offshore Project would not be expected to have a disproportional effect on important food resources. The potential impacts on fish receptors would be expected to be localised, short term and reversible. In view of these factors, LSE associated with changes in food resource can be excluded for Offshore Project effects, either alone or in combination with other plans and projects.

7.2.2. Acoustic Disturbance or Injury

This section considers the following pressure:

- Injury or disturbance from subsea acoustic emissions

The Offshore Project construction phase may cause disturbance due to acoustic emissions that result from anchor installation, with risk primarily associated with the potential requirement for driven piles. Additional risk will also be associated with UXO clearance activities (if these are required). However, it should be noted that the number of UXO that are present (if any) will not be known until site -specific UXO surveys are completed (post -consent but pre-construction). Therefore, UXO clearance would be subject to a separate Marine Licence, to be applied for post-consent, if required. In view of the known sensitivity of harbour porpoise to impulsive noise, such as acoustic emissions produced during percussive pile driving activities, it is not possible to conclude no LSE on Annex II harbour porpoise populations from Offshore Project construction activities. However, it is not expected that the Offshore Project will require any activities during the O&M, or decommissioning phases that will produce impulsive emissions; as such no LSE is concluded for acoustic disturbance during these phases from Offshore Project effects, either alone or in -combination with other plans or projects.

All phases of Offshore Project activity will involve the presence of works vessels such as but not limited to heavy lift vessels, jack-up barges, crew transport vessels, or cable laying vessels. The presence of these vessels will be associated with an increase in noise above background levels. This introduces a pathway for acoustic disturbance to sensitive species. However, it is expected that vessel activity will be low relative to background levels. Vessel activity will also be highly focussed on the Offshore Project footprint; as such, any changes will be highly localised.

Given the low sound levels associated with vessel presence the spatial extent of effects is highly localised. As such, any effects that do occur will affect a small spatial area. Given the extensive range within which harbour porpoise are known to forage, this extent of effect is considered to be relatively small. In view of these factors, it is concluded that LSE can be ruled out for vessel disturbance to designated Annex II populations of harbour porpoise during all project phases from Offshore Project effects, either alone or in combination with other plans or projects.

7.2.3. Risk of Injury

This section considers the following pressures:

- Vessel collision
- Entanglement

The increase in vessel activity within the Offshore Project due to construction, O&M, and decommissioning activities will be associated with an increase in risk of vessel strike. Any collision that did occur would present a high risk of injury or death.

The risk of collision between vessels and marine mammals is considered to be very low when vessels are travelling at slow speed. Wilson *et al.* (2017) noted that seal collisions were rare in relation to the frequency of seal encounters and identified a significant reduction in the number of seal collisions for vessels travelling at <4 knots. Harbour porpoise are considered at a higher risk of collision with vessels that are travelling at speeds of 13-14 knots or more (IAMMWG, 2015). Offshore Project works vessels will be stationary when on site, and slow-moving during transit. Harbour porpoise are known to move away from areas in which vessels are present (Benhemma-Le Gall *et al.*, 2021; Pigeault *et al.*, 2024), this reduces the likelihood of collisions due to a reduction in animal density within the locality of works vessels. In addition, all project vessels will stick to established vessel transit routes where applicable. Given the regular vessel movements within these routes and in the areas around the Offshore Project it is considered that harbour porpoise exhibit a degree of habituation to vessel presence. The number of vessel movements will be low relative to background vessel traffic; therefore, the increase attributable to the Offshore Project will constitute a negligible change. As such, it is considered there is negligible risk of injury from this pressure and LSE can be ruled out for disturbance on designated Annex II populations of harbour porpoise during all project phases.

Within the Array Area there will be between 3 and 9 mooring lines attached to each floating substructure. These lines will remain present, extending through the water column for the duration of the project lifetime (expected 35 years), potentially presenting risk of entanglement for marine mammals. Smaller cetaceans, such as harbour porpoise, are not considered to be at risk of entanglement in mooring lines themselves (Benjamins *et al.*, 2014), but are considered to be at risk of entanglement with fishing gear or other material that may become caught up in these mooring lines.

In view of this risk of entanglement with 'ghost fishing gear' it is considered that there is risk of injury to designated Annex II harbour porpoise from entanglement from the Offshore Project, and LSE cannot be excluded during the Offshore Project operational lifetime. However, given that this risk is associated with discarded fishing gear which may accumulate over time, it is considered there is no risk during the construction phase, as it is highly unlikely that gear would yet be present. Equally it is expected that debris would be removed during decommissioning. As such, the conclusion of LSE is concluded only for the Offshore Project operational phase.

7.2.4. Pollution Events

This section considers the following pressure:

- Accidental release of pollutants

There is potential that activities which cause seabed disturbance, such as but not limited to cable installation, could mobilise sediments containing chemical contaminants, thereby introducing these substances into the wider marine environment. However, there is no oil and gas activity known to have occurred within the vicinity of the Array Area and Offshore Cable Corridor Area of Search (NSTA, 2024). There is 1 small open dredge spoil deposit site (FI008: Scrabster Extension) and 3 closed sites (FI002: Dounreay Microsite; FI005: Scrabster; and FI010: Thurso) within the Offshore Cable Corridor Area of Search (Scottish Government, 2024). FI002, FI005, and FI008 are disposal sites associated with the now decommissioned NRS Dounreay NPP. Due to nature of NPP-related dredge disposal, there is potential for the presence of radioactive contaminants at these disposal sites. Remobilisation of contaminated sediments can, as noted previously, result in contamination of the water column and other areas where sediment may deposit. It should be noted that chemical testing is performed prior to dredging and disposal at these sites to ensure sediment does not contain unacceptable levels of chemical contaminants. Therefore, the risk of contaminated sediments being present within the Array Area and Offshore Cable Corridor Area of Search are low.

The Offshore Cable Corridor Area of Search includes potential landfall locations at areas of coastline close to the Dounreay NPP. Fragments of irradiated nuclear fuel (particles) have been discovered on the foreshore at Dounreay since 1983 (PRAGD, 2012). Subsequent monitoring programmes have identified that potentially up to several hundred thousand particles have been discharged into the marine environment; a

2 km radius fishing exclusion zone has since been put in place around the site's marine diffuser chamber (PRAGD, 2012). The greatest risk of harm from these particles is associated with ingestion or sustained skin contact. Many particles that have been detected in subsequent monitoring are buried and therefore do not currently pose a threat to marine organisms. However, should these be mobilised due to sediment disturbance during cable trenching operations then this may result in an increased level of risk. Although harbour porpoise forage on various fish species, these range from schooling pelagic, to demersal, and even benthic fishes. As such, these animals may inadvertently consume the potentially contaminated sediment material. At this stage it is not known where the Offshore Project will make landfall, and therefore it is not known whether the associated cable route will intersect areas within which irradiated nuclear fuel particles have been detected. As such, it is not possible at this stage to exclude LSE for the release of contaminants through mobilisation of contaminated sediments. It should be noted, LSE may subsequently be excluded should the Offshore Project pursue an export cable route that does not intersect these areas of contamination. In this eventuality an amended assessment/justification would be provided to NatureScot and the Marine Directorate to explain any changes in screening outcome.

There is additional potential for accidental release of chemicals from works vessels, such as diesel oil, sewage, or antifouling substances applied to works vessels. These substances may contaminate benthic communities targeted by harbour porpoise during foraging activities. The Array Area is situated in waters of depths ranging 75-116 m; as such, there is high capacity for dilution of any hydrophilic contaminants that are released. However, hydrophobic substances, such as oil, will remain at the surface and extent of distribution will be unaffected by water depth. Toxic effects that may potentially result from this include reduction in abundance, biomass, and/or diversity of harbour porpoise prey. The Applicant will implement various designed in mitigation measures to reduce the likelihood of such pollution events. These will be discussed in more detail within the RIAA.

In view of the risk that the presence of works vessels may lead to the introduction of chemical contaminants, it is not possible to rule out LSE from this pressure from Offshore Project effects alone or in combination with other plans or projects on designated Annex II harbour porpoise populations within the sites listed in Table 7.2-1.

7.2.5. Distributional Effects

This section considers the following pressure:

- Barrier to species movement

Barrier effects may occur if the presence of floating turbine structures, and their associated mooring infrastructure displace harbour porpoise and cause an increase in swimming time as they avoid the Array Area. Should this occur, it could cause an increase in energy expenditure due to increased travel time while

foraging. Given that transmission assets along the Offshore Cable Corridor Area of Search will be buried, it is considered there is no pathway for barrier effects within this area.

The presence of the floating WTGs and substructures during the operational phase of the Offshore Project has the potential to result in barrier effects for marine mammals. However, various post construction monitoring studies have reported marine mammal presence within operational fixed foundation wind farm sites. For example, harbour porpoise and harbour seal were regularly reported during long term monitoring at the Horns Rev and Nysted offshore wind farms in Denmark. At this site, although numbers initially decreased below baseline levels, abundances recovered by year 2 (Diederichs *et al.*, 2008). Conversely, porpoise activity increased relative to reference sites following construction at Egmond aan Zee OWF in the Netherlands (Scheidat *et al.*, 2011). It has been suggested that marine mammal presence around turbine structures may be related to increased foraging success due to the reef effect caused by these newly introduced structures (Lindeboom *et al.*, 2011; Russell *et al.*, 2014).

There is an absence of monitoring data to show whether these animals are also attracted to or displaced from floating substructures. However, it is considered unlikely that floating structures will present an appreciable barrier to animal movement, due the small portion of the water column occupied at this site, and the size of individual harbour porpoise.

The Array Area is 40.16 km at its widest point. Given that the closest SAC (Inner Hebrides and the Minches SAC) with harbour porpoise as a qualifying feature is located >40 km from the Array Area, the Offshore Project is considered to represent a relatively small barrier. Any increase in time required to reach foraging areas is expected to be small relative to overall distance travelled while foraging. In addition, evidence collected at fixed foundation OWFs suggest it is unlikely that floating offshore wind structures will cause a barrier to harbour porpoise; as such, it is likely that their presence will not cause any degree of barrier. Taking these factors into account, it is concluded that LSE from distributional effects on designated harbour porpoise populations caused by the presence of the Offshore Project can be excluded for all project phases, either alone or in combination with other plans or projects.

7.2.6. Electromagnetic Fields (EMF)

This section considers the following pressure:

- Effects of EMF

The presence of electrical transmission infrastructure within the marine environment will produce both an E-field and B-field when in operation. These are collectively referred to as an EMF. Subsea cables are insulated to prevent E-fields from interacting with the environment; accordingly, EMF within the marine environment consists solely of the B-field. The strength of EMF is dependent on the electric current strength through the cable and reduces with perpendicular distance away from the cable.

Marine mammals are not considered to be sensitive to EMF. However, it is noted that there is a lack of certainty over its effects on these animals. There is evidence that some cetacean species use natural magnetic fields for navigation during long distance migration (Kirschvinck *et al.*, 1990); accordingly, marine mammals may be capable of detecting small changes in EMF (Walker *et al.*, 2003). This is supported by anatomical evidence, such as the presence of magnetite in the tongues and lower jawbones of harbour porpoise (Klinowska 1990). However, due to the limited range of effects of EMF associated with offshore wind cables, it is expected that effects would be limited to animals that forage in or near the benthos (Normandeau *et al.*, 2011). Although there may be a degree of effect within the water column from dynamic cables, animal density within the pelagic zone is much lower than that at transitions such as the seabed. As such, there is negligible risk of interaction with effects from dynamic cables. It is likely that the potential range of effects from EMF on marine mammals is highly localised, due to the rapid decrease in field strength within short distances of the cable location. As a result of this, only a very small proportion of overall habitat used by these species would be affected. In addition, existing evidence suggests that the levels of EMFs emitted by offshore renewable energy export cables are at a level low enough that there is no potential for direct significant impacts on marine mammals (Gill and Desender, 2020).

Taking account of the trivial spatial extent of EMF relative to the extensive foraging grounds utilised by harbour porpoise, it is concluded that there is no LSE for effects of the Offshore Project alone or in combination with other plans or projects from EMF during the O&M phase.

7.2.7. SUMMARY

Table 7.2-3 provides a summary of the conclusions drawn in Sections 7.2.1-7.2.6.

Table 7.2-3 Determination of LSE for Annex II Populations of Harbour Porpoise Listed as Qualifying Features for the SACs Listed in Table 7.2-1.

Pressure	Project Stage	Screening Outcome
Indirect effects from changes in availability or distribution of prey species	Construction	No LSE
	Operation and Maintenance	
	Decommissioning	
Effects of habitat change on foraging activities	Construction	No LSE
	Operation and Maintenance	
	Decommissioning	

Pressure	Project Stage	Screening Outcome
Injury or disturbance from subsea acoustic emissions	Construction	LSE determined for injury or disturbance due to impulsive emissions (i.e. percussive pile driving or UXO detonation). No LSE determined for disturbance from vessel activity.
	Operation and Maintenance	No LSE
	Decommissioning	No LSE
Vessel collision	Construction	No LSE
	Operation and Maintenance	
	Decommissioning	
Entanglement	Construction	No LSE
	Operation and Maintenance	LSE
	Decommissioning	No LSE
Changes in suspended solids (water clarity)	Construction	No LSE
	Operation and Maintenance	
	Decommissioning	
Pollution events	Construction	LSE
	Operation and Maintenance	
	Decommissioning	
Barrier to species movement	Construction	No LSE
	Operation and Maintenance	

Pressure	Project Stage	Screening Outcome
	Decommissioning	
Effects of EMF	Construction	No LSE
	Operation and Maintenance	
	Decommissioning	

7.3. Grey Seal

No sites were identified with grey seal as a qualifying feature which satisfied the criteria for connectivity with Offshore Project activities, as detailed in Table 4.1-1. Accordingly, grey seal is scoped out of assessment within RIAA.

7.4. Harbour Seal

No sites were identified with harbour seal as a qualifying feature which satisfied the criteria for connectivity with Offshore Project activities, as detailed in Table 4.1-1. Accordingly, harbour seal is scoped out of assessment within RIAA.

7.5. European Otter

European otter has been scoped out. No LSE has been concluded as it is considered there is no pathway for effects on this species from Offshore Project activities. A separate HRA process for the onshore elements (landward of MLWS; i.e. the Onshore Project), will cover European otter, should it be required.

8. Screening for Annex I Bird Species

A different approach to screening is taken for Annex I bird species due to the extensive foraging ranges and subsequently large list of sites where there is potential for connectivity to the Offshore Project. Initially, potential connectivity has been identified through foraging ranges (Woodward *et al.*, 2019; NatureScot, 2023a) and potential interaction with marine usage areas and migratory routes (Section 8.1; APPENDIX B; APPENDIX C). Following this, pressures associated with the Offshore Project are described, and determinations on whether there is potential for LSE to arise (with regard to any individual receptor) are made (Section 8.2). The third stage is an assessment of usage of the Offshore Project by each qualifying feature (informed by the DAS and third-party data and studies) and an assessment of feature sensitivity to each aforementioned pressure (Section 8.3). This results in production of a matrix presenting which

qualifying features of which sites are screened in for which pressures (i.e. where no LSE could not be determined), as presented in APPENDIX D.

8.1. Special Protection Areas and Ramsar Sites

As detailed in Table 4.1-1, connectivity between Offshore Project activities and populations of classified Annex I bird species was determined through consideration of species specific- foraging ranges[14] (as detailed by Woodward *et al.*, 2019; NatureScot, 2023a), and various other pre-defined screening buffers. Based on these metrics, a total of 172 qualifying features (11 species) of 82 sites with potential connectivity with the Array Area were identified. All sites with potential connectivity are listed in APPENDIX B and the 11 species listed in Table 8.1-1.

Table 8.1-1 Species for Which Connectivity was Identified between the Array Area and SPAs and Ramsar Sites. Associated Foraging Ranges (mean maximum + 1 standard deviation; Woodward et al., 2019) Provided, and Number of Sites Within Foraging Range Where the Species is a Qualifying Feature Also Listed.

Common Name	Scientific Name	Foraging Range (km)	No. Sites
Black-legged Kittiwake	*Rissa tridactyla*	300.6	26
Great Black-backed Gull	*Larus marinus*	73.0	1
Great skua	*Stercorarius skua*	931.2	10
Common guillemot[1]	*Uria aalge*	95.2	10
Razorbill[1]	*Alca torda*	122.2	7
Atlantic puffin	*Fratercula arctica*	265.4	13
European storm petrel	*Hydrobates pelagicus*	336.0	3
Leach's storm petrel	*Hydrobates leucorhous*	657.0	5
Northern fulmar	*Fulmarus glacialis*	1,200.2	67

[14] All distances between SPAs and Ramsar Sites and components of the Offshore Project (Array Area; Offshore Cable Corridor Area of Search) are calculated based on the shortest distance (i.e. straight line) to the boundary of the site. The centroid positions of sites have not been, and, as per NatureScot guidance and discussion during the Scoping Workshop, will not be, used in any part of screening. The centroids will only be used to apportion project specific abundances and impacts to specific SPA or Ramsar Site colonies, as per NatureScot advice.

Common Name	Scientific Name	Foraging Range (km)	No. Sites
Manx shearwater	*Puffinus puffinus*	2,365.5	17
Northern gannet[2]	*Morus bassanus*	509.4	9

[1] Exceptions apply to northern Isle SPAs, where foraging ranges of 153.7 km and 164.6 km are used for Common Guillemot and Razorbill, respectively (NatureScot, 2023a).
[2] Exceptions apply to the Grassholm, St Kilda, and Forth Islands SPAs, where Northern Gannet foraging range is 516.7 km, 590.0 km, and 709.0 km, respectively (NatureScot, 2023a).

In addition to the SPAs and qualifying features identified in relation to the Array Area, 96 qualifying features of 25 sites (35 species) have potential for connectivity to the Offshore Cable Corridor Area of Search. The key qualifying features of these SPAs and Ramsar Sites are listed in Table 8.1-2.

Here, a 50 km buffer has been applied to identify sites. This accounts for the smaller scale of effect compared with that in the Array Area (as discussed through Section 8.1) but also ensures key sites within the Offshore Cable Corridor Area of Search are considered appropriately. Further screening of sites within 15 km was undertaken, where non-breeding and intertidal features within 15 km or intertidal and terrestrial features with connectivity during migration[15] (Wright *et al.*, 2012) have been screened in. It should be noted that effects arising from the Offshore Cable Corridor Area of Search are also considered where these may affect the qualifying features listed in Table 8.1-1.

Table 8.1-2 Species for Which Connectivity was Identified Between the Offshore Cable Corridor Area of Search and SPAs and Ramsar Sites (based on foraging ranges or screening buffers). Species specific- Foraging Ranges (mean maximum + 1 standard deviation; Woodward et al., 2019) Provided, and Number of Sites Within Foraging Range Where the Species is a Qualifying Feature Also Listed.

Common Name	Scientific Name	Screening Buffer (km)[a]	No. Sites
Barnacle Goose	*Branta leucopsis*	15	2
Greylag Goose	*Anser anser*	15	4
Greater White-fronted Goose	*Anser albifrons flavirostris*	15	2
Whooper Swan	*Cygnus cygnus*	15	2
Eurasian Wigeon	*Anas penelope*	15	2

[15] Connectivity during migration has been determined using the British Trust for Ornithology's Strategic Ornithological Support Services Migration Assessment Tool (SOSS-MAT), as detailed in Section 8.3.12.

Common Name	Scientific Name	Screening Buffer (km)[a]	No. Sites
Eurasian Teal	*Anas crecca*	15	1
Greater Scaup	*Aythya marila*	15[b]	1
Common Scoter	*Melanitta nigra*	15	3
Slavonian Grebe	*Podiceps auritus*	15[a]	3
European Golden Plover	*Pluvialis apricaria*	15	3
Eurasian Curlew	*Numenius arquata*	15	1
Ruff	*Calidris pugnax*	15	1
Dunlin	*Calidris alpina schinzii*	15	4
Wood Sandpiper	*Tringa glareola*	15	2
Common Greenshank	*Tringa nebularia*	15	2
Black-legged Kittiwake	*Rissa tridactyla*	300.6	8
Great Black-backed Gull	*Larus marinus*	73	4
European Herring Gull	*Larus argentatus*	85.6	1
Arctic Tern	*Sterna paradisaea*	40.5	1
Great Skua	*Stercorarius skua*	931.2	2
Arctic Skua	*Stercorarius parasiticus*	2.7	1
Common Guillemot	*Uria aalge*	95.2	9
Razorbill	*Alca torda*	122.2	5
Atlantic Puffin	*Fratercula arctica*	265.4	5
Red-throated Diver	*Gavia stellata*	9	2

Common Name	Scientific Name	Screening Buffer (km)[a]	No. Sites
Black-throated Diver	*Gavia arctica*	15	2
European Storm Petrel	*Hydrobates pelagicus*	336	1
Leach's Storm Petrel	*Oceanodroma leucorhoa*	657	2
Northern Fulmar	*Fulmarus glacialis*	1,200.2	7
Northern Gannet	*Morus bassanus*	509.4	2
Great Cormorant	*Phalacrocorax carbo*	33.9	1
European Shag	*Gulosus aristotelis*	23.7	1
Short-eared Owl	*Asio flammeus*	0[a]	3
Merlin	*Falco columbarius*	0[a]	3
Peregrine Falcon	*Falco peregrinus*	0	1

[a] Screening buffer based on: (1) Species-specific foraging ranges for breeding seabirds, or (2) 15 km for non-breeding and intertidal birds, or (3) 0 km for terrestrial birds.
[b] Species screened in for potential impacts during migration only (SPAs/Ramsar Sites for these species are not within the relevant screening buffer (foraging range, 15 km, or 9 km).

8.2. Pressures

Consideration has been given to pathways to LSE for the sites for which connectivity was established (Table 8.1-1 and Table 8.1-2). This has been divided into two sub-stages, firstly all pressures identified as presenting potential pathways to LSE are assessed to determine if they are applicable to some or all aspects of the proposed Offshore Project activities (Section 8.2); secondly consideration is made of species specific sensitivity to these pressures (Section 8.3).

8.2.1. Collision

The Offshore Project infrastructure will comprise up to 110 WTGs each with a maximum rotor diameter of 330 m and a minimum air gap (between minimum blade tip height and mean sea level (MSL)) of 22 m. Therefore, there is risk of collision between WTGs and flying birds during foraging, transiting, or migrating activities. Collision risk is present only within the Array Area and only during the Operation and Maintenance phase of the Offshore Project.

8.2.2. Distributional Responses (Displacement and Barrier Effect due to the Offshore Project Infrastructure)

The term 'distributional responses' includes displacement and barrier effects. Displacement affects birds which are actively using the Array Area, such as for foraging or loafing. Barrier effects affect passing individuals, either during migration or transiting to access foraging areas. Both effects may result in an increase in energy expenditure and/or a reduction in predation success or food intake. As the effects are difficult to distinguish, they are grouped and assessed together as distributional responses (NatureScot, 2023b).

The Array Area comprises 391 km^2, and the Offshore Project infrastructure will comprise up to 110 WTGs with a maximum blade tip height of 385 m above MSL. The presence of infrastructure in the Array Area can result in distributional responses in seabird and migratory bird populations during the Operation and Maintenance phase of the Offshore Project.

8.2.3. Vessel- and Equipment-related Disturbance

Although similar to distributional responses, vessel related disturbance is considered a separate pressure due to key differences in longevity, frequency, location, and spatial extent, resulting in a difference in magnitude of effect. Vessel-related disturbance includes temporary disturbance and displacement effects associated with project works, including vessel activity, construction and maintenance equipment, and decommissioning activities. Effects associated with fixed project infrastructure are assessed under distributional responses.

The increase in vessel activity within the Offshore Project due to construction, O&M, and decommissioning activities will be associated with an increase in disturbance of seabirds and birds making use of the marine environment. Whilst it is expected that the magnitude of increase in vessel traffic due to Offshore Project activities will be low when considered in the context of existing background vessel traffic around the north coast of Scotland, it is not possible to ascertain Offshore Project vessel activity at this stage, therefore, there is potential for LSE alone and in combination.

8.2.4. Artificial Light Emissions

The Offshore Project will involve use of a range of light sources, including those for marine navigation and safety on vessels and infrastructure, aircraft navigational safety lighting on the WTGs, and works lights on operational vessels and equipment should any construction, maintenance or decommissioning take place between dusk and dawn. The greatest intensities of light emissions are expected to be those associated with ongoing works (vessels and equipment) across the Offshore Project Area (including both the Array Area and the Offshore Cable Corridor Area of Search) and navigation and safety lighting associated with infrastructure within the Array Area (i.e., the WTGs). Other sources of light will include other infrastructure, such as RCSs (if required) located along the export cable route and lower intensity and frequency works vessels during O&M.

The exact intensity and nature of Artificial Light at Night (ALAN) emissions is not known at this stage, however, due to the sensitivity of some species, it is not possible to conclude no LSE for this pressure. There is limited evidence and research on the effects of ALAN on most seabird species. The majority of research focusses on Procellariiformes (tubenoses), primarily storm petrels and shearwaters (NatureScot, 2020; Deakin *et al.*, 2022). The available evidence for this taxa group shows disorientation, attraction (Miles *et al.*, 2010; Deakin *et al.*, 2022), grounding (Rodríguez *et al.*, 2023), and collision with structures (Guilford *et al.*, 2018). Effects may be more prominent on younger birds, such as those on first migration after the breeding season (Syposz *et al.*, 2018). Alcidae (auks) can also be sensitive to ALAN, with evidence of grounding due to onshore artificial lights present near breeding colonies of burrowing auks (Rodríguez *et al.*, 2017). Although there is less research looking at other species, the available evidence suggests that sensitivity of non-passerine birds is low (NatureScot, 2020).

Therefore, while ALAN effects are screened in overall, there is only potential for LSE to Procellariiformes and Atlantic puffin *Fratercula arctica*; for all other species, No LSE is determined. There is potential for LSE within the Array Area and along the export cable route, the former due to the presence of WTGs and the latter due to RCSs, and due to vessel activity in both areas.

8.2.5. Entanglement (due to Ghost Fishing Gear)

Within the Array Area there will be between 3 and 9 mooring lines attached to each floating substructure. These lines will remain present, extending through the water column for the duration of the project lifetime (expected 35 years), potentially presenting risk of entanglement for diving seabird species. The risk of entanglement arises from fishing gear or other material that may become caught up in these mooring lines. Further details on management measures and practices during the O&M stage to reduce likelihood of ghost fishing gear becoming caught up in mooring lines will be included in the RIAA. As such, at this stage, there is potential for LSE with respect to diving birds.

8.2.6. Toxic Contamination and Pollution Events

There is potential that activities which cause seabed disturbance, such as but not limited to cable installation, could mobilise sediments containing chemical contaminants, thereby introducing these substances into the wider marine environment. However, there is no oil and gas activity known to have occurred within the vicinity of the Array Area and Offshore Cable Corridor Area of Search (NSTA, 2024). There is 1 small open dredge spoil deposit site (FI008: Scrabster Extension) and 3 closed sites (FI002: Dounreay Microsite; FI005: Scrabster; and FI010: Thurso) within the Offshore Cable Corridor Area of Search (Scottish Government, 2024). FI002, FI005, and FI008 are disposal sites associated with the now decommissioned NRS Dounreay NPP. Due to nature of NPP-related dredge disposal, there is potential for the presence of radioactive contaminants at these disposal sites. Remobilisation of contaminated sediments can, as noted previously, result in contamination of the water column and other areas where sediment may

deposit. It should be noted that chemical testing is performed prior to dredging and disposal at these site to ensure sediment does not contain unacceptable levels of chemical contaminants.

The Offshore Cable Corridor Area of Search includes potential landfall locations at areas of coastline close to the Dounreay NPP, outside of the disposal sites discussed above. Fragments of irradiated nuclear fuel (particles) have been discovered on the foreshore at Dounreay since 1983 (PRAGD, 2012). Subsequent monitoring programmes have identified that potentially up to several hundred thousand particles have been discharged into the marine environment; a 2 km radius fishing exclusion zone has since been put in place around the site's marine diffuser chamber (PRAGD, 2012). The greatest risk of harm from these particles is associated with ingestion or sustained skin contact. Many particles that have been detected in subsequent monitoring are buried and therefore do not current pose a threat to marine organisms. However, should these be mobilised due to sediment disturbance during cable trenching operations then this may result in an increased level of risk. Several marine and intertidal bird species forage on fish and benthic species. As such, these animals may inadvertently consume the potentially contaminated sediment material. At this stage it is not known where the Offshore Project will make landfall, and, therefore, it is not known whether the associated cable route will intersect areas within which irradiated nuclear fuel particles have been detected.

Although the risk of contaminated sediments affecting birds within the Array Area and Offshore Cable Corridor Area of Search are generally low, there is potential for LSE at the North Caithness Cliffs SPA, as it is located near the disposal sites (FI002: 525 m; FI005: 85 m; FI008: 450 m; and FI010: 990 m [distances to Offshore Project boundary]), is in the vicinity of the Dounreay NPP (up to 1 km from the Landfall Area of Search), and has direct overlap with the Offshore Cable Corridor Area of Search. It is not possible to conclude no LSE for all qualifying features of this site that make use of the marine environment. No LSE is concluded for all other sites with regard to release of contaminated sediments. It should be noted, LSE at the North Caithness Cliffs SPA may subsequently be excluded should the Offshore Project pursue an export cable route that does not intersect these areas of contamination. In this eventuality an amended assessment/justification would be provided to NatureScot and the Marine Directorate to explain any changes in screening outcome.

There is also potential for accidental release of chemicals from works vessels, such as diesel oil, sewage, or antifouling substances applied to works vessels. These substances may contaminate benthic communities, fish and shellfish receptors, and/or the water column and sea surface. The Array Area is situated in waters of depths ranging 75-116 m; as such, there is high capacity for dilution of any hydrophilic contaminants that are released. However, hydrophobic substances, such as oil, will remain at the surface and the extent of distribution will be unaffected by water depth. Toxic effects that may potentially result from this include reduction in abundance, biomass, and/or diversity of seabird and intertidal bird prey, as well as direct impacts to individuals on the surface of the water. The Applicant will implement various designed in

mitigation measures to reduce the likelihood of such pollution events. These will be discussed in more detail within the RIAA.

8.2.7. Habitat Loss and Impacts to Supporting Habitat, including Prey Species

This section considers the following pressures:

- Indirect effects from changes in availability or distribution of prey species
- Effects of habitat change on foraging activities
- Changes in suspended solids (water clarity)

Subtidal seabed disturbance may occur as a result of direct disturbance during burial of inter-array or export cables (installation methods included ploughing, jetting, cutting, and controlled flow excavation), the operation of jack-up vessels, anchor installation, or within the mooring line swept area. The duration of effect for these activities ranges from short term temporary (e.g. habitat damage caused by cable installation within soft seabed sediments) to long term temporary (e.g. seabed disturbance within the mooring line swept area is likely to reoccur regularly due to line movement and as such should be considered an ongoing impact for the entire Offshore Project lifetime (expected 35 years).

In addition, where cable protection is required during the construction or O&M phases, this would be associated with habitat change or loss. Where this occurs over areas of soft or mixed sediment types this change will be long term (expected project duration of 35 years). Where additional solid material is placed on existing rocky habitat it may be possible for this to be colonised by similar communities to those present within the baseline environment; however, it is likely this recovery period would extend over a period of years.

All of these activities would lead to direct disturbance or damage, which may alter habitat suitability for characterising species. This could result in displacement of typical species, or introduction and establishment of previously absent species or communities. Such changes may potentially impact availability of prey species targeted by seabirds during foraging.

The Offshore Cable Corridor Area of Search extends for 135 km, and the maximum width of potential seabed disturbance is 20 m per cable. Given that up to 6 cables will be installed, this could be associated with up to 16.2 km² of seabed disturbance. It should be noted that this value is considered to be precautionary, as it assumes that there would be no overlap in extent of disturbance for each of these 6 cables. The worst-case footprint for anchor structures is associated with gravity base anchors. If these were used, it is predicted that there would be up to 900 m² of seabed habitat change/loss per anchor.

At this early stage of project development, it is not possible to state the spatial extent of cable protection that is expected to be required. However, more detailed engineering studies will be available as the Offshore Project design matures which will be fed into the RIAA. . In addition, details of mooring line swept

area and expected jack-up barge disturbance footprint is not currently known but will also be incorporated in detailed RIAA. Therefore, there is potential for LSE with regard to benthic habitat loss within the Array Area and the Offshore Cable Corridor Area of Search.

There is also potential for benthic habitats and associated communities to be indirectly affected by Offshore Project activities through pressures associated with sediment plumes. Sediment mobilisation may occur due to burial of inter-array or export cables (installation methods such as but not limited to ploughing, jetting, cutting, and controlled flow excavation), anchor placement, construction or decommissioning of the offshore substation, or due to disturbance associated with movement of mooring lines.

In the Array Area, there are limited means for resuspension and transport of seabed sediment, due to the weak tidal currents and deep water depths (which restrict interaction with wave action). This limits the incidence of resuspension and transportation to extreme weather events, such as storms. This conclusion is supported by the low levels of suspended sediment identified within the region (Scottish continental shelf) throughout all seasons (<2 mg/l) (Cefas, 2016). However, seabed disturbance arising from construction, maintenance, or decommissioning activities (such as but not limited to cable laying and anchor placement) may cause adverse effects on benthic communities as these are expected to cause an increase in suspended SSC.

Offshore Project activities during all phases are associated with potential for sediment mobilisation, which would increase turbidity, thereby potentially disturbing foraging of visual cue led foraging species. However, spring tidal velocities in the Array Area are around 0.4 m/s, increasing towards the coast but with a high degree of local variation due to the bathymetry. Flows at headlands on the coast may increase to 1 m/s but flows in embayments may be less, generally <0.4 m/s. The consequence of the lower flows in the Array Area are that the tidal excursions are smaller, approximately 4.5 km with a relatively open tidal ellipse. Due to these low flow rates, any plumes produced by Offshore Project activities are expected to be small, and temporary.

There is, therefore, potential for LSE from the Offshore Project during the construction and decommissioning phases only, considering the expected infrequency of works during O&M. Due to the distance from coast and greater water depths at the Array Area, it is considered that there is no potential for LSE arising from increases in suspended sediment concentration within the Array Area.

As outlined in the Offshore Project Scoping Report, fish and shellfish populations may be affected through the following impact pathways:

- Temporary seabed habitat loss and/or disturbance
- Increases in suspended sediment concentration
- Reduction in water quality due to the release of contaminants from seabed sediment disturbance
- Underwater noise and vibration

- Permanent seabed habitat loss/disturbance
- EMF effects from cables
- Fish and shellfish aggregation effects due to the presence of infrastructure in the water column and on the seabed
- Ghost fishing gear due to the presence of lost fishing gear entangled/snagged by infrastructure

Although these demonstrate impact pathways on fish and shellfish receptor groups, the fish community in the area surrounding the Offshore Project is determined to be representative of other areas along the north Scotland coast, and as such effects from the Offshore Project would not be expected to have a disproportional effect on important food resources. The potential impacts on fish communities would be expected to be localised, short term and reversible. No LSE is therefore concluded from Offshore Project effects on fish communities and associated indirect impacts on classified bird populations, either alone or in combination.

8.2.8. SUMMARY

An overview of pressures and LSE is presented in Table 8.2-1. Where LSE could not be excluded (i.e. where there is potential for LSE or expected LSE), pressures are considered with respect to all qualifying features of SPAs with connectivity to the Array Area and the Offshore Cable Corridor Area of Search.

Table 8.2-1 Pressures Relevant to Annex I Birds Species (SPA and Ramsar Site features) and Determination of No LSE or Potential for LSE for the Array Area and the Offshore Cable Corridor Area of Search in Each Phase of the Offshore Project (C = Construction, O&M = Operations and Maintenance and D = Decommissioning)

Pressure	Array Area			Offshore Cable Corridor Area of Search		
	C	O&M	D	C	O&M	D
Collision (with infrastructure)	No LSE	LSE	No LSE	No LSE	No LSE	No LSE
Distributional responses (due to infrastructure)	No LSE	LSE	No LSE	No LSE	No LSE	No LSE
Vessel-related disturbance	LSE	LSE	LSE	LSE	LSE	LSE
ALAN	LSE	LSE	LSE	LSE	LSE	LSE
Entanglement (due to ghost fishing gear)	No LSE	LSE	No LSE	No LSE	No LSE	No LSE

Pressure	Array Area			Offshore Cable Corridor Area of Search		
	C	O&M	D	C	O&M	D
Toxic contamination and pollution events	LSE	LSE	LSE	LSE	LSE	LSE
Habitat loss (including prey availability)	LSE	No LSE	LSE	LSE	No LSE	LSE

8.3. Species Accounts

Site-specific DAS have been successfully executed monthly since March 2023, with data available from March 2023 to February 2024 at the time of writing. The DAS data have been used to inform the species summaries presented below. The second year of DAS data (March 2024 – February 2025) will be available and analysed to inform the RIAA.

8.3.1. Black-legged Kittiwake

Black-legged kittiwake *Rissa tridactyla* was observed in moderate numbers, with density estimates ranging from <0.01-0.44 birds/km^2 in the DAS and is a qualifying feature of 26 classified SPAs within its breeding season foraging range (156.1 ± 144.5 km; Woodward *et al.*, 2019). The closest classified breeding colonies are located at the North Rona and Sula Sgeir SPA (22.6 km northwest of the Array Area) and the Cape Wrath SPA (23.8 km south of the Array Area). Black-legged kittiwake is sensitive to the following pressures described in Section 8.1 (Furness *et al.*, 2013; Wade *et al.*, 2016; Table 8.3-1):

- Collision
- Distributional responses
- Habitat loss
- Contamination

Table 8.3-1 Determination of LSE for Black-legged Kittiwake Rissa tridactyla for Each Identified Pressure

Pressure	Project Aspect	Project Stage	Screening	Justification
	Array Area	Construction	No LSE	

Pressure	Project Aspect	Project Stage	Screening	Justification
Collision (with infrastructure)		Operation and Maintenance	Potential for LSE	Collision can only occur within the Array Area during operation.
		Decommissioning	No LSE	
	Offshore Cable Corridor Area of Search	Construction	No LSE	
		Operation and Maintenance		
		Decommissioning		
Distributional responses (due to infrastructure)	Array Area	Construction	No LSE	Displacement due to infrastructure can only occur within the Array Area during operation.
		Operation and Maintenance	Potential for LSE	
		Decommissioning	No LSE	
	Offshore Cable Corridor Area of Search	Construction	No LSE	
		Operation and Maintenance		
		Decommissioning		
Vessel-related disturbance	Array Area	Construction	No LSE	Black-legged kittiwake is largely insensitive to vessel-related disturbance at sea (Furness *et al.*, 2013).
		Operation and Maintenance		
		Decommissioning		
	Offshore Cable	Construction		
		Operation and Maintenance		

Pressure	Project Aspect	Project Stage	Screening	Justification
	Corridor Area of Search	Decommissioning		
ALAN	Array Area	Construction	No LSE	Black-legged kittiwake is not sensitive to artificial light emissions.
		Operation and Maintenance		
		Decommissioning		
	Offshore Cable Corridor Area of Search	Construction		
		Operation and Maintenance		
		Decommissioning		
Entanglement (due to ghost fishing gear)	Array Area	Construction	No LSE	Black-legged kittiwake uses only the upper water column for foraging, thus entanglement risk is negligible.
		Operation and Maintenance		
		Decommissioning		
	Offshore Cable Corridor Area of Search	Construction		
		Operation and Maintenance		
		Decommissioning		
Toxic contamination and pollution events	Array Area	Construction	Potential for LSE	Toxic contamination is screened in for the North Caithness Cliffs SPA only, as discussed in Section 8.2.6. There
		Operation and Maintenance		
		Decommissioning		

Pressure	Project Aspect	Project Stage	Screening	Justification
	Offshore Cable Corridor Area of Search	Construction		is also potential for pollution to occur due to accidental release of contaminants from vessels, equipment, and infrastructure.
		Operation and Maintenance		
		Decommissioning		
Habitat loss (including prey availability)	Array Area	Construction	Potential for LSE	Long- and short-term habitat loss associated with infrastructure and seabed works will take place in all phases.
		Operation and Maintenance		
		Decommissioning		
	Offshore Cable Corridor Area of Search	Construction	Potential for LSE	There is only potential for LSE during construction and decommissioning. No LSE is concluded during the operation and maintenance phase as works will be limited to repair and replacement of cables and cable protection, infrequent, and cover a very limited spatial extent at any given time (i.e. will affect a negligible proportion of supporting habitat).
		Operation and Maintenance	No LSE	
		Decommissioning	Potential for LSE	

8.3.2. Large Gulls

Great black backed gull *Larus marinus* was observed less frequently (December to March only) than blacklegged kittiwake in the DAS, with density estimates peaking at 0.10 birds/km^2. The species has a

foraging range of 73.0 ± 0.0 km (Woodward *et al.*, 2019) and is a qualifying feature of 1 SPA within this distance, the North Rona and Sula Sgeir SPA. There are no other classified breeding colonies within foraging range of the Array Area.

European herring gull *Larus argentatus* was observed in very low numbers in the first year of DAS, with a total of 3 individuals recorded, in December 2023, giving a density of 0.02 birds/km^2. The species is a qualifying feature of the East Caithness Cliffs SPA, the only classified breeding colony within foraging range of the Offshore Project (Woodward *et al.*, 2019).

European herring gull and great black-backed gull share the following similar sensitivity to pressures, as discussed in Section 8.1 (Furness *et al.*, 2013; Wade *et al.*, 2016; Table 8.3-2):

- Collision

Table 8.3-2 Determination of LSE for Great Black backed- Gull Larus marinus and European Herring Gull L. argentatus for Each Identified Pressure

Pressure	Project Aspect	Project Stage	Screening	Justification
Collision (with infrastructure)	Array Area	Construction	No LSE	Collision can only occur within the Array Area during operation.
		Operation and Maintenance	Potential for LSE	
		Decommissioning	No LSE	
	Offshore Cable Corridor Area of Search	Construction	No LSE	
		Operation and Maintenance		
		Decommissioning		
Distributional responses (due to infrastructure)	Array Area	Construction	No LSE	Large gulls are not sensitive to displacement effects (Furness *et al.*, 2013; Wade *et al.*, 2016).
		Operation and Maintenance		
		Decommissioning		
		Construction		

Pressure	Project Aspect	Project Stage	Screening	Justification
	Offshore Cable Corridor Area of Search	Operation and Maintenance		
		Decommissioning		
Vessel-related disturbance	Array Area	Construction	No LSE	
		Operation and Maintenance		
		Decommissioning		
	Offshore Cable Corridor Area of Search	Construction		
		Operation and Maintenance		
		Decommissioning		
ALAN	Array Area	Construction	No LSE	Large gulls are not sensitive to artificial light emissions.
		Operation and Maintenance		
		Decommissioning		
	Offshore Cable Corridor Area of Search	Construction		
		Operation and Maintenance		
		Decommissioning		
Entanglement (due to ghost fishing gear)	Array Area	Construction	No LSE	Large gulls feed on the water surface, thus there is no pressure
		Operation and Maintenance		

Pressure	Project Aspect	Project Stage	Screening	Justification
		Decommissioning		receptor pathway for entanglement.
	Offshore Cable Corridor Area of Search	Construction		
		Operation and Maintenance		
		Decommissioning		
Toxic contamination and pollution events	Array Area	Construction	Potential for LSE	Toxic contamination is screened out (No LSE), as discussed in Section 8.2.6. There is potential for pollution to occur due to accidental release of contaminants from vessels, equipment, and infrastructure.
		Operation and Maintenance		
		Decommissioning		
	Offshore Cable Corridor Area of Search	Construction		
		Operation and Maintenance		
		Decommissioning		
Habitat loss (including prey availability)	Array Area	Construction	No LSE	Large gulls are opportunistic foragers making use of a range of resources, prey, and habitats (del Hoyo *et al.*, 1996).
		Operation and Maintenance		
		Decommissioning		
	Offshore Cable Corridor Area of Search	Construction		
		Operation and Maintenance		
		Decommissioning		

8.3.3. Arctic Tern

Arctic tern *Sterna paradisaea* was recorded infrequently in the first year of DAS, with observations in May, August, and October 2023 and density estimates peaking at 0.32 birds/km² within the Array Area (August). The species is a qualifying feature of 1 site (Pentland Firth Islands SPA; 20.5 km from the Array Area) within foraging range (25.7 ± 14.8 km; Woodward *et al.*, 2019) of the Offshore Cable Corridor Area of Search (20.5 km), with no classified breeding sites within foraging range of the Array Area. The species can be sensitive to the following impacts (Furness *et al.*, 2013; Wade *et al.*, 2016; Table 8.3-3):

- Impacts to supporting habitat, including increased suspended sediments and reduced prey species
- Contamination
- Disturbance at breeding grounds

Table 8.3-3 Determination of LSE for Arctic Tern Sterna paradisaea for Each Identified Pressure

Pressure	Project Aspect	Project Stage	Screening	Justification
Collision (with infrastructure)	Array Area	Construction	No LSE	There is no connectivity between Arctic tern and the Array Area due to species foraging range (Woodward *et al.*, 2019); infrastructure will only be present in the Array Area.
		Operation and Maintenance		
		Decommissioning		
	Offshore Cable Corridor Area of Search	Construction		
		Operation and Maintenance		
		Decommissioning		
Distributional responses (due to infrastructure)	Array Area	Construction	No LSE	
		Operation and Maintenance		
		Decommissioning		
	Offshore Cable Corridor Area of Search	Construction		
		Operation and Maintenance		

Pressure	Project Aspect	Project Stage	Screening	Justification
		Decommissioning		
Vessel-related disturbance	Array Area	Construction	No LSE	There is no connectivity between Arctic tern and the Array Area.
		Operation and Maintenance		
		Decommissioning		
	Offshore Cable Corridor Area of Search	Construction	Potential for LSE	There is potential for foraging terns to be displaced by operational vessels in the Cable Corridor Area of Search.
		Operation and Maintenance		
		Decommissioning		
ALAN	Array Area	Construction	No LSE	Arctic tern is not sensitive to artificial light emissions.
		Operation and Maintenance		
		Decommissioning		
	Offshore Cable Corridor Area of Search	Construction		
		Operation and Maintenance		
		Decommissioning		
Entanglement (due to ghost fishing gear)	Array Area	Construction	No LSE	There is no connectivity between Arctic tern and the Array Area and there is no entanglement risk within the Cable
		Operation and Maintenance		
		Decommissioning		
		Construction		

Pressure	Project Aspect	Project Stage	Screening	Justification
	Offshore Cable Corridor Area of Search	Operation and Maintenance		Corridor Area of Search (Section 8.2.5).
		Decommissioning		
Toxic contamination and pollution events	Array Area	Construction	No LSE	There is no connectivity between Arctic tern and the Array Area.
		Operation and Maintenance		
		Decommissioning		
	Offshore Cable Corridor Area of Search	Construction	Potential for LSE	Toxic contamination is screened out (No LSE), as discussed in Section 8.2.6. There is potential for pollution to occur due to accidental release of contaminants from vessels, equipment, and infrastructure.
		Operation and Maintenance		
		Decommissioning		
Habitat loss (including prey availability)	Array Area	Construction	No LSE	There is no connectivity between Arctic tern and the Array Area.
		Operation and Maintenance		
		Decommissioning		
	Offshore Cable Corridor Area of Search	Construction	Potential for LSE	Habitat loss during construction and decommissioning will arise from cable burial, seabed preparation
		Operation and Maintenance	No LSE	

Pressure	Project Aspect	Project Stage	Screening	Justification
		Decommissioning	Potential for LSE	and scour protection; during operation and maintenance frequency, extent and magnitude will be much reduced impact a negligible proportion of foraging habitat and time, thus No LSE is concluded.

8.3.4. SKUAS

Great skua *Stercorarius skua* and Arctic skua *S. parasiticus* were observed infrequently and in low numbers, with observations in May and August (great skua) and December (Arctic skua), with densities peaking at 0.01 birds/km^2 and 0.05 birds/km^2 for each species, respectively. Great skua is a feature of 10 SPAs/Ramsar Sites within foraging range of the Array Area and 2 sites within 50 km of the Offshore Cable Corridor Area of Search. Arctic skua has a much smaller known foraging range, of 2.7 km (Woodward *et al.*, 2019), however, is a qualifying feature of 1 site within this distance of the Offshore Cable Corridor Area of Search. The species are sensitive to the following pressures described in Section 8.1 (Furness *et al.*, 2013; Wade *et al.*, 2016; Table 8.3-4):

- Collision risk
- Toxic contamination

Table 8.3-4 Determination of LSE for Great Skua Stercorarius skua and Arctic Skua S. parasiticus for Each Identified Pressure

Pressure	Project Aspect	Project Stage	Screening	Justification
Collision (with infrastructure)	Array Area	Construction	No LSE	Collision can only occur within the Array Area during operation.
		Operation and Maintenance	Potential for LSE	
		Decommissioning	No LSE	
		Construction	No LSE	

Pressure	Project Aspect	Project Stage	Screening	Justification
	Offshore Cable Corridor Area of Search	Operation and Maintenance		
		Decommissioning		
Distributional responses (due to infrastructure)	Array Area	Construction	No LSE	Skuas are not sensitive to displacement effects (Furness *et al;* 2013; Wade *et al.*, 2016).
		Operation and Maintenance		
		Decommissioning		
	Offshore Cable Corridor Area of Search	Construction		
		Operation and Maintenance		
		Decommissioning		
Vessel-related disturbance	Array Area	Construction	No LSE	Skuas are not sensitive to vessel-related disturbance effects (Furness *et al.*; Wade *et al.*, 2016)
		Operation and Maintenance		
		Decommissioning		
	Offshore Cable Corridor Area of Search	Construction		
		Operation and Maintenance		
		Decommissioning		
ALAN	Array Area	Construction	No LSE	Skuas are not sensitive to artificial light emissions.
		Operation and Maintenance		

Pressure	Project Aspect	Project Stage	Screening	Justification
		Decommissioning		
	Offshore Cable Corridor Area of Search	Construction		
		Operation and Maintenance		
		Decommissioning		
Entanglement (due to ghost fishing gear)	Array Area	Construction	No LSE	Skuas feed in the upper water column and on the surface only, therefore, there is no pathway for entanglement.
		Operation and Maintenance		
		Decommissioning		
	Offshore Cable Corridor Area of Search	Construction		
		Operation and Maintenance		
		Decommissioning		
Toxic contamination and pollution events	Array Area	Construction	Potential for LSE	Toxic contamination is screened out (No LSE), as discussed in Section 8.2.6. There is potential for pollution to occur due to accidental release of contaminants from vessels, equipment, and infrastructure.
		Operation and Maintenance		
		Decommissioning		
	Offshore Cable Corridor Area of Search	Construction		
		Operation and Maintenance		
		Decommissioning		
	Array Area	Construction	No LSE	

Pressure	Project Aspect	Project Stage	Screening	Justification
Habitat loss (including prey availability)		Operation and Maintenance		Skuas can feed on a range of prey items use a variety of habitats, and are kleptoparasites, thus are adaptable to foraging habitat loss.
		Decommissioning		
	Offshore Cable Corridor Area of Search	Construction		
		Operation and Maintenance		
		Decommissioning		

8.3.5. AUKS

Five auk species were observed in the DAS: little auk *Alle alle*, common guillemot *Uria aalge*, razorbill *Alca torda*, black guillemot *Cepphus grylle*, and Atlantic puffin *Fratercula arctica*. However, only 3 (common guillemot, razorbill, and Atlantic puffin) have classified breeding colonies within foraging range of the Array Area or within 50 km of the Offshore Cable Corridor Area of Search. These species have been observed in almost every survey to date with abundance estimates peaking at 17,845 common guillemot in the survey area[16].

Common guillemot was observed in high numbers throughout the survey area, with density estimates ranging from 0.41-10.63 birds/km^2 in the survey area and 0.36-12.65 birds/km^2 in the Array Area, with highest numbers recorded in August and September, coinciding with the end of the breeding season (NatureScot, 2020). There are SPAs/Ramsar Sites where common guillemot is a qualifying feature within foraging range of the Array Area and 9 within 50 km of the Offshore Cable Corridor Area of Search.

Razorbill followed a similar temporal trend to common guillemot although peak counts were recorded in August. The species had lower recorded abundance and density estimates throughout, ranging from 0.02-1.70 birds/km^2 and 0.03-1.48 birds/km^2 in the survey area and the Array Area, respectively. There are 7 SPAs or Ramsar Sites classified for breeding razorbill within foraging range of the Array Area and 5 sites within 50 km of the Offshore Cable Corridor Area of Search.

Atlantic puffin was not recorded in March 2023 or February 2024, and numbers in October to January were noticeably lower than other months. Peak densities were during the breeding season, in June: 4.50 birds/km^2 in the survey area and 1.86 birds/km^2 in the Array Area. Atlantic puffin is a qualifying feature

[16] The survey area is comprised of the full extent of the Digital Aerial Surveys (DAS), covering the Array Area plus a 10 km buffer.

of 13 SPAs or Ramsar Sites within foraging range of the Array Area and 5 sites within 50 km of the Offshore Cable Corridor Area of Search.

Auks are sensitive to the following pressures described in Section 8.1 (Furness *et al.*, 2013; Wade *et al.*, 2016; Table 8.3-5):

- Distributional responses
- Vessel-related disturbance
- Habitat loss
- Entanglement
- Toxic contamination

Table 8.3-5 Determination of LSE for Common Guillemot Uria aalge, Razorbill Alca torda and Atlantic Puffin Fratercula arctica for Each Identified Pressure

Pressure	Project Aspect	Project Stage	Screening	Justification
Collision (with infrastructure)	Array Area	Construction	No LSE	Auks are insensitive to collision (Furness *et al.*, 2013; Wade *et al.*, 2016) due to their flight characteristics (Johston *et al.*, 2014).
		Operation and Maintenance		
		Decommissioning		
	Offshore Cable Corridor Area of Search	Construction		
		Operation and Maintenance		
		Decommissioning		
Distributional responses (due to infrastructure)	Array Area	Construction	No LSE	Infrastructure will only be present during operation and maintenance and in the Array Area.
		Operation and Maintenance	Potential for LSE	
		Decommissioning	No LSE	
		Construction	No LSE	

Pressure	Project Aspect	Project Stage	Screening	Justification
	Offshore Cable Corridor Area of Search	Operation and Maintenance		
		Decommissioning		
Vessel-related disturbance	Array Area	Construction	Potential for LSE	Auks can be sensitive to disturbance by operational vessels (Fliessbach *et al.*, 2019).
		Operation and Maintenance		
		Decommissioning		
	Offshore Cable Corridor Area of Search	Construction		
		Operation and Maintenance		
		Decommissioning		
ALAN	Array Area	Construction	Potential for LSE	Auks, particularly Atlantic puffin *Fratercula arctica*, can be sensitive to ALAN near breeding colonies (Rodríguez *et al.*, 2017).
		Operation and Maintenance		
		Decommissioning		
	Offshore Cable Corridor Area of Search	Construction		
		Operation and Maintenance		
		Decommissioning		
Entanglement (due to ghost fishing gear)	Array Area	Construction	No LSE	Infrastructure will only be present in the Array Area during operation and
		Operation and Maintenance	Potential for LSE	

Pressure	Project Aspect	Project Stage	Screening	Justification
		Decommissioning	No LSE	maintenance, thus, entanglement can only occur during this stage.
	Offshore Cable Corridor Area of Search	Construction	No LSE	There is no water column project infrastructure in the Cable Corridor Area of Search, thus, there is no pathway for entanglement.
		Operation and Maintenance		
		Decommissioning		
Toxic contamination and pollution events	Array Area	Construction	Potential for LSE	Toxic contamination is screened in for the North Caithness Cliffs SPA only, as discussed in Section 8.2.6. There is also potential for pollution to occur due to accidental release of contaminants from vessels, equipment, and infrastructure.
		Operation and Maintenance		
		Decommissioning		
	Offshore Cable Corridor Area of Search	Construction		
		Operation and Maintenance		
		Decommissioning		
Habitat loss (including prey availability)	Array Area	Construction	Potential for LSE	Habitat loss in the Array Area can occur due to seabed preparation, installation, and maintenance works.
		Operation and Maintenance		
		Decommissioning		
		Construction	Potential for LSE	Habitat loss during construction and

Pressure	Project Aspect	Project Stage	Screening	Justification
	Offshore Cable Corridor Area of Search	Operation and Maintenance	No LSE	decommissioning will arise from cable burial, seabed preparation and scour protection; during operation and maintenance the frequency, extent and magnitude will be much reduced resulting in a negligible impact to a limited proportion of foraging habitat over a limited period of time, thus No LSE is concluded.
		Decommissioning	Potential for LSE	

8.3.6. DIVERS

Red-throated diver *Gavia stellata* and black-throated diver *G. arctica* are qualifying features (breeding populations) of the Caithness and Sutherland Peatlands SPA and Ramsar Site, located 1.4 km from the Offshore Cable Corridor Area of Search. Red-throated diver was recorded in very low numbers (one individual) and black-throated diver was not observed in the DAS.

Divers can be sensitive to the following pressures discussed in Section 8.1 (Furness *et al.*, 2013; Wade *et al.*, 2016; Fliessbach *et al.*, 2019; Mendel *et al.*, 2019; Table 8.3-6):

- Disturbance associated with vessel activity (up to 5 km) and project infrastructure (up to 10 km)
- Habitat loss

Table 8.3-6 Determination of LSE for Red-Throated Diver Gavia stellata and Black-throated Diver G. immer for Each Identified Pressure

Pressure	Project Aspect	Project Stage	Screening	Justification
	Array Area	Construction	No LSE	

Pressure	Project Aspect	Project Stage	Screening	Justification
Collision (with infrastructure)		Operation and Maintenance		There is no connectivity between red-throated or black-throated divers and the Array Area due to species foraging ranges (Woodward *et al.*, 2019); infrastructure will only be present in the Array Area.
		Decommissioning		
	Offshore Cable Corridor Area of Search	Construction		
		Operation and Maintenance		
		Decommissioning		
Distributional responses (due to infrastructure)	Array Area	Construction	No LSE	There is no connectivity between red-throated or black-throated divers and the Array Area due to species foraging ranges (Woodward *et al.*, 2019); infrastructure will only be present in the Array Area.
		Operation and Maintenance		
		Decommissioning		
	Offshore Cable Corridor Area of Search	Construction		
		Operation and Maintenance		
		Decommissioning		
Vessel-related disturbance	Array Area	Construction	No LSE	There is no connectivity between divers and the Array Area.
		Operation and Maintenance		
		Decommissioning		
		Construction		

Pressure	Project Aspect	Project Stage	Screening	Justification
	Offshore Cable Corridor Area of Search	Operation and Maintenance	Potential for LSE	Divers can be highly sensitive to vessel-related disturbance (Fliessbach *et al.*, 2019; Mendel *et al.*, 2019).
		Decommissioning		
ALAN	Array Area	Construction	No LSE	Divers are not sensitive to artificial light emissions.
		Operation and Maintenance		
		Decommissioning		
	Offshore Cable Corridor Area of Search	Construction		
		Operation and Maintenance		
		Decommissioning		
Entanglement (due to ghost fishing gear)	Array Area	Construction	No LSE	There is no connectivity between divers and the Array Area, and there is no project infrastructure in the water column in the Cable Corridor Area of Search.
		Operation and Maintenance		
		Decommissioning		
	Offshore Cable Corridor Area of Search	Construction		
		Operation and Maintenance		
		Decommissioning		
	Array Area	Construction	No LSE	

Pressure	Project Aspect	Project Stage	Screening	Justification
Toxic contamination and pollution events		Operation and Maintenance		There is no connectivity between divers and the Array Area.
		Decommissioning		
	Offshore Cable Corridor Area of Search	Construction	Potential for LSE	Toxic contamination is screened out (No LSE), as discussed in Section 8.2.6. There is potential for pollution to occur due to accidental release of contaminants from vessels, equipment, and infrastructure.
		Operation and Maintenance		
		Decommissioning		
Habitat loss (including prey availability)	Array Area	Construction	No LSE	There is no connectivity between divers and the Array Area.
		Operation and Maintenance		
		Decommissioning		
	Offshore Cable Corridor Area of Search	Construction	Potential for LSE	There is only potential for LSE during construction and decommissioning. No LSE is concluded during the operation and maintenance phase as works will be limited to repair and replacement of cables and cable protection, infrequent, and cover
		Operation and Maintenance	No LSE	
		Decommissioning	Potential for LSE	

Pressure	Project Aspect	Project Stage	Screening	Justification
				a very limited spatial extent at any given time (i.e. will affect a negligible proportion of supporting habitat).

8.3.7. Storm Petrels

European storm petrel *Hydrobates pelagicus* and Leach's storm petrel *H. leucorhous* were recorded in low numbers and infrequently (European) or not at all (Leach's) in the DAS. In addition to the identified species, there were recorded observations of storm petrels that could not be identified to species level in the DAS. Storm petrels were observed in June, August and September, with density estimates of 0.02-0.12 birds/km^2 in the Array Area.

Although recorded in low numbers and relatively infrequently, both species are qualifying features of a number of SPAs within foraging range (Woodward *et al.*, 2019), including the North Rona and Sula Sgeir SPA, located 22.6 km to the northwest of the Array Area. Due to the low numbers of individuals recorded in the DAS, breeding colonies outside the average European storm petrel foraging range (159 km), observed at the Mousa colony (Bolton, 2021), are screened out and no LSE is concluded. An iterative approach will be applied in the RIAA, where if no adverse effect cannot be determined at a breeding colony, the next nearest site will also be assessed.

Storm petrels are sensitive to the following pressures described in Section 8.1 (Furness *et al.*, 2013; Wade *et al.*, 2016; Table 8.3-7):

- ALAN near to breeding colonies and along migration routes, especially juvenile and immature birds during their first migration after the breeding season, which may result in collision or distributional response effects
- Habitat loss
- Contamination

Table 8.3-7 Determination of LSE for European Storm Petrel Hydrobates pelagicus and Leach's Storm Petrel H. leucorhous for Each Identified Pressure

Pressure	Project Aspect	Project Stage	Screening	Justification
	Array Area	Construction	No LSE	

Pressure	Project Aspect	Project Stage	Screening	Justification
Collision (with infrastructure)		Operation and Maintenance	Potential for LSE	Collision can only occur within the Array Area during operation. Flight height data (Johnston *et al.*, 2014) suggest these species show low sensitivity to collision; however, there is potential for LSE on a precautionary basis due to close proximity of the Array Area to breeding colonies.
		Decommissioning	No LSE	
	Offshore Cable Corridor Area of Search	Construction	No LSE	
		Operation and Maintenance		
		Decommissioning		
Distributional responses (due to infrastructure)	Array Area	Construction	No LSE	Displacement due to infrastructure can only occur within the Array Area during operation. There is limited evidence to suggest these species are sensitive to displacement, however, there is potential for LSE on a precautionary basis due to close proximity of the Array Area to breeding colonies and effects of artificial light.
		Operation and Maintenance	Potential for LSE	
		Decommissioning	No LSE	
	Offshore Cable Corridor Area of Search	Construction	No LSE	
		Operation and Maintenance		
		Decommissioning		
Vessel-related disturbance	Array Area	Construction	No LSE	There is limited evidence to suggest these species are
		Operation and Maintenance		

Pressure	Project Aspect	Project Stage	Screening	Justification
		Decommissioning		displaced by operational vessels.
	Offshore Cable Corridor Area of Search	Construction		
		Operation and Maintenance		
		Decommissioning		
ALAN	Array Area	Construction	Potential for LSE	Storm petrels are known to be sensitive to ALAN. ALAN will be of lower frequency and intensity during operation in all areas, much less so in the Cable Corridor Area of Search.
		Operation and Maintenance		
		Decommissioning		
	Offshore Cable Corridor Area of Search	Construction		
		Operation and Maintenance		
		Decommissioning		
Entanglement (due to ghost fishing gear)	Array Area	Construction	No LSE	The species feed in the upper water column, thus there is limited potential for entanglement.
		Operation and Maintenance		
		Decommissioning		
	Offshore Cable Corridor Area of Search	Construction		
		Operation and Maintenance		
		Decommissioning		
	Array Area	Construction		

Pressure	Project Aspect	Project Stage	Screening	Justification
Toxic contamination and pollution events		Operation and Maintenance	Potential for LSE	Toxic contamination is screened out (No LSE), as discussed in Section 8.2.6. There is potential for pollution to occur due to accidental release of contaminants from vessels, equipment, and infrastructure.
		Decommissioning		
	Offshore Cable Corridor Area of Search	Construction		
		Operation and Maintenance		
		Decommissioning		
Habitat loss (including prey availability)	Array Area	Construction	Potential for LSE	Long- and short-term habitat loss associated with infrastructure and seabed works will take place in all phases.
		Operation and Maintenance		
		Decommissioning		
	Offshore Cable Corridor Area of Search	Construction	Potential for LSE	There is only potential for LSE during construction and decommissioning. No LSE is concluded during the operation and maintenance phase as works will be limited to repair and replacement of cables and cable protection, infrequent, and cover a very limited spatial extent at any given time (i.e. will affect a negligible proportion of supporting habitat).
		Operation and Maintenance	No LSE	
		Decommissioning	Potential for LSE	

8.3.8. Northern Fulmar

Northern fulmar has an extensive foraging range of 542.3 ± 657.9 km (Woodward *et al.*, 2019), meaning there is a wide number of colonies within its breeding season foraging range of the Array Area (67, 7 of which are within 50 km of the Offshore Cable Corridor Area of Search). Whilst its mean maximum foraging range is extensive, this is due to foraging trips during the early breeding season, when individuals are less constrained by the need to attend a nest and feed chicks (Edwards *et al.*, 2013). In the later breeding season, during the chick-rearing period, individuals have been recorded foraging much closer inshore (average 60 km; Weimerskirch *et al.*, 2001).

Based on its foraging habits throughout the breeding season, the average foraging range + 1 standard deviation (134.6 ± 90.1 km; 224.7 km; Woodward *et al.*, 2019) has been applied to the original long list (based on a 1,200.2 km screening distance) and no LSE is concluded for sites outside this distance. Based on this approach, no LSE is concluded for 49 sites within 1,200.2 km but outside 224.7 km, with 18 breeding sites to be taken forward to the RIAA. An iterative approach will be applied in the RIAA, where if no adverse effect cannot be determined at a breeding colony, the next nearest site will also be assessed.

Northern fulmar was recorded in moderate numbers in the DAS, with observations every month and density estimates ranging from 0.02 birds/km^2 in the Array Area in October to 0.95 birds/km^2 in November.

The species is sensitive to the following pressures described in Section 8.1 (Furness *et al.*, 2013; Wade *et al.*, 2016; Table 8.3-8):

- Contamination
- ALAN (potential for sensitivity)

Table 8.3-8 Determination of LSE for Northern Fulmar Fulmarus glacialis for Each Identified Pressure

Pressure	Project Aspect	Project Stage	Screening	Justification
Collision (with infrastructure)	Array Area	Construction	No LSE	Collision can only occur within the Array Area during operation. Flight height data (Johnston *et al.*, 2014) suggest northern fulmar shows low sensitivity to collision; however, there is potential for LSE on a precautionary basis due
		Operation and Maintenance	Potential for LSE	
		Decommissioning	No LSE	
	Offshore Cable Corridor Area of Search	Construction	No LSE	
		Operation and Maintenance		

Pressure	Project Aspect	Project Stage	Screening	Justification
		Decommissioning		to close proximity of the Array Area to breeding colonies.
Distributional responses (due to infrastructure)	Array Area	Construction	No LSE	Displacement due to infrastructure can only occur within the Array Area during operation. There is limited evidence to suggest this species is sensitive to displacement, however, there is potential for LSE on a precautionary basis due to close proximity of the Array Area to breeding colonies and effects of artificial light.
		Operation and Maintenance	Potential for LSE	
		Decommissioning	No LSE	
	Offshore Cable Corridor Area of Search	Construction	No LSE	
		Operation and Maintenance		
		Decommissioning		
Vessel-related disturbance	Array Area	Construction	No LSE	There is limited evidence to suggest this species is displaced by operational vessels.
		Operation and Maintenance		
		Decommissioning		
	Offshore Cable Corridor Area of Search	Construction		
		Operation and Maintenance		
		Decommissioning		
ALAN	Array Area	Construction		

Pressure	Project Aspect	Project Stage	Screening	Justification
		Operation and Maintenance	Potential for LSE	Northern fulmar may be sensitive to ALAN. ALAN will be of lower frequency and intensity during operation in all areas, much less so in the Cable Corridor Area of Search.
		Decommissioning		
	Offshore Cable Corridor Area of Search	Construction		
		Operation and Maintenance		
		Decommissioning		
Entanglement (due to ghost fishing gear)	Array Area	Construction	No LSE	The species feed in the upper water column, thus there is limited potential for entanglement.
		Operation and Maintenance		
		Decommissioning		
	Offshore Cable Corridor Area of Search	Construction		
		Operation and Maintenance		
		Decommissioning		
Toxic contamination and pollution events	Array Area	Construction	Potential for LSE	Toxic contamination is screened in for the North Caithness Cliffs SPA only, as discussed in Section 8.2.6. There is also potential for pollution to occur due to accidental release of contaminants from
		Operation and Maintenance		
		Decommissioning		
	Offshore Cable Corridor Area of Search	Construction		
		Operation and Maintenance		

Pressure	Project Aspect	Project Stage	Screening	Justification
		Decommissioning		vessels, equipment, and infrastructure.
Habitat loss (including prey availability)	Array Area	Construction	No LSE	The species can use a range of habitats and prey for foraging (del Hoyo *et al.*, 1996), thus shows limited sensitivity to loss of habitat. It also has an extensive foraging range, meaning there are alternative areas of habitat outside the Offshore Project.
		Operation and Maintenance		
		Decommissioning		
	Offshore Cable Corridor Area of Search	Construction		
		Operation and Maintenance		
		Decommissioning		

8.3.9. Manx Shearwater

Manx shearwater *Puffinus puffinus* also has an extensive foraging range (1,346.8 ± 1,018.7 km; Woodward *et al.*, 2019), with 17 sites within foraging range of the Array Area, the nearest (St Kilda and Rum SPAs) being 176 km and 180 km away. Other sites are in excess of 300 km from the Array Area. The species was recorded in low numbers in the DAS, with a total of 9 observations, 2 in June and 7 in September, with a peak density estimate of 0.04 birds/km^2 in the survey area.

Due to low observations of the species in the DAS, it is considered that there is limited potential for connectivity between the Array Area and distant Manx shearwater breeding colonies. The species extensive mean maximum foraging range (2,365.5 km) has been applied to identify sites in the initial screening exercise, however, the average foraging range + 1 standard deviation (136.1 ± 88.7 km; 224.8 km; Woodward *et al.*, 2019) has been used to determine sites with greatest likelihood of connectivity. Following this approach, no LSE is determined for 14 sites, with 3 taken forward for RIAA. An iterative approach will be applied in the RIAA, where if no adverse effect cannot be determined at a breeding colony, the next nearest site will also be assessed.

Manx shearwater is sensitive to similar pressures (Section 8.1) as storm petrels (Furness *et al.*, 2013; Wade *et al.*, 2016; Table 8.3-9):

- ALAN near to breeding colonies and along migration routes

- Sensitivity to displacement and collision is unknown, however, available data on flight height (Johnston *et al.*, 2014) suggest the species is at low risk of collision

Table 8.3-9 Determination of LSE for Manx Shearwater Puffinus puffinus for Each Identified Pressure

Pressure	Project Aspect	Project Stage	Screening	Justification
Collision (with infrastructure)	Array Area	Construction	No LSE	Collision can only occur within the Array Area during operation. Flight height data (Johnston *et al.*, 2014) suggest Manx shearwater shows low sensitivity to collision; however, there is potential for LSE on a precautionary basis.
		Operation and Maintenance	Potential for LSE	
		Decommissioning	No LSE	
	Offshore Cable Corridor Area of Search	Construction	No LSE	
		Operation and Maintenance		
		Decommissioning		
Distributional responses (due to infrastructure)	Array Area	Construction	No LSE	Displacement due to infrastructure can only occur within the Array Area during operation. There is limited evidence to suggest this species is sensitive to displacement, however, there is potential for LSE on a precautionary basis due to artificial light.
		Operation and Maintenance	Potential for LSE	
		Decommissioning	No LSE	
	Offshore Cable Corridor Area of Search	Construction	No LSE	
		Operation and Maintenance		
		Decommissioning		
Vessel-related disturbance	Array Area	Construction	No LSE	There is limited evidence to suggest Manx shearwater is displaced by operational vessels.
		Operation and Maintenance		
		Decommissioning		

Pressure	Project Aspect	Project Stage	Screening	Justification
	Offshore Cable Corridor Area of Search	Construction		
		Operation and Maintenance		
		Decommissioning		
ALAN	Array Area	Construction	Potential for LSE	Manx shearwater is known to be sensitive to ALAN. ALAN will be of lower frequency and intensity during operation in all areas, much less so in the Cable Corridor Area of Search.
		Operation and Maintenance		
		Decommissioning		
	Offshore Cable Corridor Area of Search	Construction		
		Operation and Maintenance		
		Decommissioning		
Entanglement (due to ghost fishing gear)	Array Area	Construction	No LSE	The species feeds in the upper water column, thus there is limited potential for entanglement.
		Operation and Maintenance		
		Decommissioning		
	Offshore Cable Corridor Area of Search	Construction		
		Operation and Maintenance		
		Decommissioning		
	Array Area	Construction		

Pressure	Project Aspect	Project Stage	Screening	Justification
Toxic contamination and pollution events		Operation and Maintenance	Potential for LSE	Toxic contamination is screened out (No LSE), as discussed in Section 8.2.6. There is potential for pollution to occur due to accidental release of contaminants from vessels, equipment, and infrastructure.
		Decommissioning		
	Offshore Cable Corridor Area of Search	Construction		
		Operation and Maintenance		
		Decommissioning		
Habitat loss (including prey availability)	Array Area	Construction	No LSE	Manx shearwater is not heavily reliant on a limited habitat for foraging and has an extensive foraging range, meaning there is alternative suitable habitat available outside the Offshore Project.
		Operation and Maintenance		
		Decommissioning		
	Offshore Cable Corridor Area of Search	Construction		
		Operation and Maintenance		
		Decommissioning		

8.3.10. Northern Gannet

Northern gannet *Morus bassanus* has a foraging range of 315.2 ±194.2 km (Woodward *et al.*, 2019), although some breeding colonies have greater averages (516.7-709.0 km; NatureScot, 2023a). There are 9 breeding SPAs/Ramsar Sites within foraging range of the Array Area, 2 of which are within 50 km of the Offshore Cable Corridor Area of Search.

The species was recorded in most months in the first year of DAS, with densities ranging between 0 birds/km^2 in January 2024 to a peak of 0.54 birds/km^2 in the Array Area in May 2023. The species was observed in largest numbers in the early breeding season, with a lull in July and August before a second peak at the end of the season (September).

Northern gannet is sensitive to the following pressures described in Section 8.1 (Furness *et al.*, 2013; Wade *et al.*, 2016; Table 8.3-10):

- Collision
- Distributional responses
- Habitat loss
- Entanglement

Table 8.3-10 Determination of LSE for Northern Gannet Morus bassanus for Each Identified Pressure

Pressure	Project Aspect	Project Stage	Screening	Justification
Collision (with infrastructure)	Array Area	Construction	No LSE	Collision can only occur within the Array Area during operation.
		Operation and Maintenance	Potential for LSE	
		Decommissioning	No LSE	
	Offshore Cable Corridor Area of Search	Construction	No LSE	
		Operation and Maintenance		
		Decommissioning		
Distributional responses (due to infrastructure)	Array Area	Construction	No LSE	Displacement due to infrastructure can only occur within the Array Area during operation.
		Operation and Maintenance	Potential for LSE	
		Decommissioning	No LSE	
	Offshore Cable Corridor Area of Search	Construction	No LSE	
		Operation and Maintenance		
		Decommissioning		
	Array Area	Construction	No LSE	

Pressure	Project Aspect	Project Stage	Screening	Justification
Vessel-related disturbance		Operation and Maintenance		Northern gannet shows limited sensitivity to disturbance by operational vessels.
		Decommissioning		
	Offshore Cable Corridor Area of Search	Construction		
		Operation and Maintenance		
		Decommissioning		
ALAN	Array Area	Construction	No LSE	Northern gannet is not sensitive to artificial light emissions.
		Operation and Maintenance		
		Decommissioning		
	Offshore Cable Corridor Area of Search	Construction		
		Operation and Maintenance		
		Decommissioning		
Entanglement (due to ghost fishing gear)	Array Area	Construction	No LSE	Entanglement can only occur when there is infrastructure in the water column (i.e. during operation); northern gannet is a diving species thus may be sensitive to entanglement in ghost fishing gear under the sea surface.
		Operation and Maintenance	Potential for LSE	
		Decommissioning	No LSE	

Pressure	Project Aspect	Project Stage	Screening	Justification
	Offshore Cable Corridor Area of Search	Construction	No LSE	There will be very limited project infrastructure in the water column in the Offshore Cable Corridor Area of Search.
		Operation and Maintenance		
		Decommissioning		
Toxic contamination and pollution events	Array Area	Construction	Potential for LSE	Toxic contamination is screened out (No LSE), as discussed in Section 8.2.6. There is potential for pollution to occur due to accidental release of contaminants from vessels, equipment, and infrastructure.
		Operation and Maintenance		
		Decommissioning		
	Offshore Cable Corridor Area of Search	Construction		
		Operation and Maintenance		
		Decommissioning		
Habitat loss (including prey availability)	Array Area	Construction	Potential for LSE	Long- and short-term habitat loss associated with infrastructure and seabed works will take place in all phases.
		Operation and Maintenance		
		Decommissioning		
	Offshore Cable Corridor Area of Search	Construction	Potential for LSE	There is only potential for LSE during construction and decommissioning. No LSE is concluded
		Operation and Maintenance	No LSE	

Pressure	Project Aspect	Project Stage	Screening	Justification
		Decommissioning	Potential for LSE	during the operation and maintenance phase as works will be limited to repair and replacement of cables and cable protection, infrequent, and cover a very limited spatial extent at any given time (i.e. will affect a negligible proportion of supporting habitat).

8.3.11. Cormorants and Shags

Great cormorant *Phalacrocorax carbo* and European shag *Gulosus aristotelis* were not recorded in the DAS and there are no SPAs or Ramsar Sites within foraging range of the Array Area (Woodward *et al.*, 2019). These species are features of several sites within 50 km of the Offshore Cable Corridor Area of Search.

Great cormorant and European shag are sensitive to the following pressures listed in Section 8.1 (Furness *et al.*, 2013; Wade *et al.*, 2016):

- Habitat loss
- Vessel-related disturbance

The screening for LSE outcome is presented in Table 8.3-11.

Table 8.3-11 Determination of LSE for Great Cormorant Phalacrocorax carbo and European Shag Gulosus aristotelis for Each Identified Pressure

Pressure	Project Aspect	Project Stage	Screening	Justification
Collision (with infrastructure)	Array Area	Construction	No LSE	There is no connectivity between great cormorant or European shag and the Array Area due to
		Operation and Maintenance		
		Decommissioning		

Pressure	Project Aspect	Project Stage	Screening	Justification
	Offshore Cable Corridor Area of Search	Construction		species foraging ranges (Woodward *et al.*, 2019); infrastructure will only be present in the Array Area.
		Operation and Maintenance		
		Decommissioning		
Distributional responses (due to infrastructure)	Array Area	Construction	No LSE	There is no connectivity between great cormorant or European shag and the Array Area due to species foraging ranges (Woodward *et al.*, 2019); infrastructure will only be present in the Array Area.
		Operation and Maintenance		
		Decommissioning		
	Offshore Cable Corridor Area of Search	Construction		
		Operation and Maintenance		
		Decommissioning		
Vessel-related disturbance	Array Area	Construction	No LSE	There is no connectivity between great cormorant or European shag and the Array Area.
		Operation and Maintenance		
		Decommissioning		
	Offshore Cable Corridor Area of Search	Construction	Potential for LSE	It is possible that individuals within the Offshore Cable Corridor Area of Search may be temporary displaced by operational vessels in all project stages.
		Operation and Maintenance		
		Decommissioning		

Pressure	Project Aspect	Project Stage	Screening	Justification
ALAN	Array Area	Construction	No LSE	Great cormorant and European shag are not sensitive to artificial light emissions.
		Operation and Maintenance		
		Decommissioning		
	Offshore Cable Corridor Area of Search	Construction		
		Operation and Maintenance		
		Decommissioning		
Entanglement (due to ghost fishing gear)	Array Area	Construction	No LSE	There is no connectivity between great cormorant or European shag and the Array Area; there will be very limited project infrastructure in the water column within the Offshore Cable Corridor Area of Search.
		Operation and Maintenance		
		Decommissioning		
	Offshore Cable Corridor Area of Search	Construction		
		Operation and Maintenance		
		Decommissioning		
Toxic contamination and pollution events	Array Area	Construction	No LSE	There is no connectivity between great cormorant or European shag and the Array Area.
		Operation and Maintenance		
		Decommissioning		
		Construction		

Pressure	Project Aspect	Project Stage	Screening	Justification
	Offshore Cable Corridor Area of Search	Operation and Maintenance	Potential for LSE	Toxic contamination is screened out (No LSE), as discussed in Section 8.2.6. There is potential for pollution to occur due to accidental release of contaminants from vessels, equipment, and infrastructure.
		Decommissioning		
Habitat loss (including prey availability)	Array Area	Construction	No LSE	There is no connectivity between great cormorant or European shag and the Array Area.
		Operation and Maintenance		
		Decommissioning		
	Offshore Cable Corridor Area of Search	Construction	Potential for LSE	There is only potential for LSE during construction and decommissioning. No LSE is concluded during the operation and maintenance phase as works will be limited to repair and replacement of cables and cable protection, infrequent, and cover a very limited spatial extent at any given time (i.e. will affect a negligible proportion of supporting habitat).
		Operation and Maintenance	No LSE	
		Decommissioning	Potential for LSE	

8.3.12. Geese, Ducks, Waders and Terrestrial Species

Due to the distance from the shore, there are no SPAs or Ramsar Sites with geese, ducks, or waders as qualifying features within 15 km of the Array Area. However, there are several within this distance of the Offshore Cable Corridor Area of Search. Qualifying features of these sites are listed in Table 8.1-2.

Sites within 50 km were considered initially, and a screening distance of 15 km has been applied to sites for intertidal features and 0 km (i.e. direct overlap) for terrestrial features. In lieu of using the latest migration Collision Risk Model (mCRM)[17] (HiDef, 2024), the previous approach (the SOSS-MAT (Wright *et al.* 2012) has been used to identify potential for connectivity between the Array Area and migratory birds. Where the tool identified that >1% of migration lines passed the Array Area, sites classified for these species have been screened in for RIAA.

Although not observed in the Array Area in high numbers, intertidal species can be affected by the presence of the Offshore Project infrastructure above the surface of the sea (i.e. WTGs) due to the risk of collision and barrier effects during migration between breeding and wintering sites.

Activities within the Offshore Cable Corridor Area of Search can also affect intertidal species in the vicinity. This includes vessel-related disturbance, loss of habitat (including impacts to prey species), and there is potential for species to be affected by ALAN during migration. The screening for LSE outcome is presented in Table 8.3-12.

Table 8.3-12 Determination of LSE for Geese, Ducks, Waders and Terrestrial Birds for Each Identified Pressure

Pressure	Project Aspect	Project Stage	Screening	Justification
Collision (with infrastructure)	Array Area	Construction	No LSE	Collision and barrier effect can only occur when project infrastructure above the sea surface is present (i.e. within the Array Area during operation and maintenance). Impacts could occur to migratory birds only, due to distance
		Operation and Maintenance	Potential for LSE	
		Decommissioning	No LSE	
	Offshore Cable Corridor Area of Search	Construction	No LSE	
		Operation and Maintenance		
		Decommissioning		

[17] Technical issues were encountered when uploading the project shapefile to the R Shiny version of thee mCRM Tool (https://hidefsurveying.shinyapps.io/mCRM/). If this tool is working at the time of undertaking the Appropriate Assessment, it will be used; otherwise, assessment conclusions will be drawn from the SOSS-MAT (Wright *et al.*, 2012).

Pressure	Project Aspect	Project Stage	Screening	Justification
				between the Array Area and the coast.
Distributional responses (due to infrastructure)	Array Area	Construction	No LSE	Collision and barrier effect can only occur when project infrastructure above the sea surface is present (i.e. within the Array Area during operation and maintenance). Impacts could occur to migratory birds only, due to distance between the Array Area and the coast.
		Operation and Maintenance	Potential for LSE	
		Decommissioning	No LSE	
	Offshore Cable Corridor Area of Search	Construction	No LSE	
		Operation and Maintenance		
		Decommissioning		
Vessel-related disturbance	Array Area	Construction	No LSE	These species do not make regular use of the Array Area, thus, there is no pressure pathway for LSE.
		Operation and Maintenance		
		Decommissioning		
	Offshore Cable Corridor Area of Search	Construction	Potential for LSE	When vessels are operating near the landfall, there is potential for intertidal and coastal birds to be disturbed by ongoing work.
		Operation and Maintenance		
		Decommissioning		
ALAN	Array Area	Construction		

Pressure	Project Aspect	Project Stage	Screening	Justification
		Operation and Maintenance	Potential for LSE	Some migratory and intertidal species may be sensitive to ALAN. ALAN will be of lower frequency and intensity during operation in all areas, much less so in the Cable Corridor Area of Search, and then only associated with essential maintenance works.
		Decommissioning		
	Offshore Cable Corridor Area of Search	Construction	Potential for LSE	
		Operation and Maintenance	No LSE	
		Decommissioning	Potential for LSE	
Entanglement (due to ghost fishing gear)	Array Area	Construction	No LSE	These species do not make regular use of the Array Area.
		Operation and Maintenance		
		Decommissioning		
	Offshore Cable Corridor Area of Search	Construction		There will be very limited project infrastructure in the water column in the Offshore Cable Corridor Area of Search.
		Operation and Maintenance		
		Decommissioning		
Toxic contamination and pollution events	Array Area	Construction	No LSE	These species do not make regular use of the Array Area.
		Operation and Maintenance		
		Decommissioning		

Pressure	Project Aspect	Project Stage	Screening	Justification
	Offshore Cable Corridor Area of Search	Construction	Potential for LSE	Toxic contamination is screened in for the North Caithness Cliffs SPA only, as discussed in Section 8.2.6. There is also potential for pollution to occur due to accidental release of contaminants from vessels, equipment, and infrastructure.
		Operation and Maintenance		
		Decommissioning		
Habitat loss (including prey availability)	Array Area	Construction	No LSE	These species do not make regular use of the Array Area, thus, there is no pressure pathway for LSE.
		Operation and Maintenance		
		Decommissioning		
	Offshore Cable Corridor Area of Search	Construction	Potential for LSE	There is only potential for LSE during construction and decommissioning. No LSE is concluded during the operation and maintenance phase as works will be limited to repair and replacement of cables and cable protection, infrequent, and cover a very limited spatial extent at any given time (i.e. will affect a
		Operation and Maintenance	No LSE	
		Decommissioning	Potential for LSE	

Pressure	Project Aspect	Project Stage	Screening	Justification
				negligible proportion of supporting habitat).

9. SUMMARY

The HRA screening exercise that has been presented in Sections 1-7 has identified various sites for which LSE cannot be excluded for non-avian features. These are summarised in Table 8.3-1.

Due to number of sites, qualifying features, and pathways to LSE, SPAs and Ramsar Sites are not included in Table 8.3-1. These sites are considered in APPENDIX B and APPENDIX C (long-list of sites within foraging ranges and screening buffers) and APPENDIX D, which contains a summary of all sites and qualifying features where a potential pathway to LSE has been identified and thus are screened in for RIAA.

Table 8.3-1 Summary of SAC Sites for Which LSE Could Not Be Excluded During the Screening Exercise. (Summary for qualifying features, and pathways to LSE, SPAs and Ramsar Sites provided within APPENDIX B-APPENDIX D.)

Site	Qualifying Feature	Pathway to LSE
Solan Bank Reef SAC	Reef	Abrasion/disturbance of the substrate on the surface of the seabed
Solan Bank Reef SAC	Reef	Penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion
Solan Bank Reef SAC	Reef	Physical change (to another sediment type)
Solan Bank Reef SAC	Reef	Changes in suspended solids (water clarity)
Solan Bank Reef SAC	Reef	Smothering and siltation rate changes
Solan Bank Reef SAC	Reef	Hydrocarbon & PAH contamination (accidental pollution events)
Solan Bank Reef SAC	Reef	Introduction or spread of INNS

Site	Qualifying Feature	Pathway to LSE
Inner Hebrides and the Minches SAC	Harbour Porpoise	Injury or disturbance from subsea acoustic emissions (percussive pile driving or UXO detonation); O&M phase only
Inner Hebrides and the Minches SAC	Harbour Porpoise	Entanglement
Inner Hebrides and the Minches SAC	Harbour Porpoise	Accidental release of pollutants
Skerries and Causeway SAC	Harbour Porpoise	Injury or disturbance from subsea acoustic emissions (percussive pile driving or UXO detonation); O&M phase only
Skerries and Causeway SAC	Harbour Porpoise	Entanglement
Skerries and Causeway SAC	Harbour Porpoise	Accidental release of pollutants

10. REFERENCES

ABPmer, 2008. Atlas of UK Marine Renewable Energy Resources. Available at: http://www.renewables-atlas.info/ [Accessed December 2024].

Albert, L., Maire, O., Olivier, F., Lambert, C., Romero-Ramirez, A., Jolivet, A., Chauvaud, L. & Chauvaud, S., 2022. Can artificial magnetic fields alter the functional role of the blue mussel, Mytilus edulis? Marine Biology, 169(6), p.75.

APEM, 2024. ScotWind Havbredey Digital Aerial Bird and Marine Megafauna Surveys. APEM Scientific Annual Report: March 2023 to February 2024 P000009020. Havbredey Limited, 10/05/24, First Draft 1.2 Issue, 462 pp.

Benhemma-Le Gall, A., Graham, I.M., Merchant, N.D. and Thompson, P.M., 2021. Broad-scale responses of harbor porpoises to pile-driving and vessel activities during offshore windfarm construction. Frontiers in Marine Science, *8*, p.664724.

Benjamins, S., Harnois, V., Smith, H.C.M., Johanning, L., Greenhill, L., Carter, C. and Wilson, B. 2014. Understanding the potential for marine megafauna entanglement risk from renewable marine energy developments. Scottish Natural Heritage Commissioned Report No. 791.

Bochert, R. & Zettler, M.L., 2006. Effect of electromagnetic fields on marine organisms. In Offshore wind energy: research on environmental impacts (pp. 223-234). Berlin, Heidelberg: Springer Berlin Heidelberg.

Bolton M, 2021. GPS tracking reveals highly consistent use of restricted foraging areas by European Storm-petrels *Hydrobates pelagicus* breeding at the largest UK colony: implications for conservation management. Bird Conservation International, 31(1): pp.35-52.

Cefas Report, 2016. Suspended Sediment Climatologies around the UK. Report for the UK Department for Business, Energy & Industrial Strategy offshore energy Strategic Environmental Assessment programme.

del Hoyo J, Elliott A, and Sargatal J (Eds), 1996. Handbook of the Birds of the World, vol. 3: Hoatzin to Auks. Lynx Edicions, Barcelona.

Deakin, Z., Cook, A., Daunt, F., McCluskie, A., Morley, N., Witcutt, E., Wright, L., and Bolton, M, 2022. A review to inform the assessment of the risk of collision and displacement in petrels and shearwater from offshore wind developments in Scotland.

Diederichs, AG, Nehls, M, Dähne, S, Adler, S, Koschinski, and U. Verfuß. 2008. Methodologies for measuring and assessing potential changes in marine mammal behaviour, abundance or distribution arising from the construction, operation and decommissioning of offshore windfarms.

Edwards, E., Quinn, L.R., Wakefield, E.D., and Miller, P.I., 2013. Tracking a northern fulmar from a Scottish nesting site to the Charlie-Gibbs Fracture Zone: Evidence of linkage between coastal breeding seabirds and Mid-Atlantic Ridge feeding sites. *Deep-Sea Research II*, 98: pp.438-444.

Fliessbach KL, Borkenhagen K, Guse N, Markones N, Schwemmer P, and Garthe S, 2019. A Ship Traffic Disturbance Vulnerability Index for Northwest European Seabirds as a Tool for Marine Spatial Planning. Frontiers in Marine Science, 6.

Furness RW, Wade HM, and Masden E, 2013. Assessing vulnerability of marine bird populations to offshore wind farms. Journal of Environmental Management, 119: pp.56-66.

Gilles, A., Hammond, P.S., and Macleod, C.D., (2023). SCANS-IV: The Fourth Small Cetacean Abundance in the North Sea and European Atlantic. Available at https://www.tiho-hannover.de/fileadmin/57_79_terr_aqua_Wildtierforschung/79_Buesum/downloads/Berichte/20230928_SCANS-IV_Report_FINAL.pdf [Accessed March 2025].

Gill, AB and Desender, M, 2020. Risk to Animals from Electro-magnetic Fields Emitted by Electric Cables and Marine Renewable Energy Devices. In A.E. Copping and L.G. Hemery (Eds.), OES-Environmental 2020 State

of the Science Report: Environmental Effects of Marine Renewable Energy Development Around the World. Report for Ocean Energy Systems (OES). (pp. 86-10). DOI: 10.2172/1633088.

Syposz, M., Gonçalves, F., Carty, M., Hoppitt, W., and Manco, F., 2018. Factors influencing Manx Shearwater grounding on the west coast of Scotland. IBIS, 160(4): pp.846-854.

Guilford, T., Padget, O., Bond, S., and Syposz, M.M., 2018. Light pollution causes object collision during local nocturnal manoeuvring flight by adult Manx Shearwaters *Puffinus puffinus*. Seabird, 31: pp.48-55.

HiDef, 2015. Digital video aerial surveys of seabirds and marine mammals at the Hexicon Dounreay Tri Project: Final Report. Report Number: HP00054-703, Draft 1. 31 December 2015.

HiDef, 2016. Digital video aerial surveys of seabirds and marine mammals at the Highlands and Islands Dounreay Demonstration Centre Project: Final Report. Report Number: HP00059-701, Final Draft. 23 September 2016.

HiDef, 2021. Digital video aerial surveys of seabirds and marine mammals at Highland Wind Limited Pentland Floating Offshore Wind Farm Project: Annual Report, September 2020 to August 2021. Report Number: HP00128-701-01, Issue v2. 3 December 2021.

HiDef, 2023. West of Orkney Offshore EIA Report Volume 2, Supporting Study 9: Marine Mammal and Megafauna Baseline Report. HC0077-1009-03-01, Final issue.

HiDef, 2024. mCRM: Avian Migration Collision Risk Model R package version 0.4.1, commit a3e39da217697432fee1d1c888924db1ace260fa. Available online at: https://github.com/HiDef-Aerial-Surveying/mCRM [Accessed March 2025].

Hutchison, Z.L., Secor, D.H. & Gill, A.B., 2020a. The interaction between resource species and electromagnetic fields associated with electricity production by offshore wind farms. Oceanography, 33(4), pp.96-107.

Hutchison, Z.L., Gill, A.B., Sigray, P., He, H. & King, J.W., 2020b. Anthropogenic electromagnetic fields (EMF) influence the behaviour of bottom-dwelling marine species. Scientific reports, 10(1), p.4219.

IAMMWG (Inter-Agency Marine Mammal Working Group), 2015. Management Units for cetaceans in UK waters (January 2015). JNCC Report No. 547, JNCC Peterborough.

IAMMWG (Inter-Agency Marine Mammal Working Group), 2023. Review of Management Unit boundaries for cetaceans in UK waters (2023). JNCC Report 734, JNCC, Peterborough, ISSN 0963-8091

Jakubowska, M., Urban-Malinga, B., Otremba, Z. & Andrulewicz, E., 2019. Effect of low frequency electromagnetic field on the behavior and bioenergetics of the polychaete Hediste diversicolor. Marine environmental research, 150, p.104766.

Jakubowska-Lehrmann, M., Białowąs, M., Otremba, Z., Hallmann, A., Śliwińska-Wilczewska, S. & Urban-Malinga, B., 2022. Do magnetic fields related to submarine power cables affect the functioning of a common bivalve? Marine Environmental Research, 179, p.105700.

JNCC (Joint Nature Conservation Committee), 2009. Standard Data Form for sites within the 'UK national site network of European sites': Solan Bank Reef. Available at: https://jncc.gov.uk/jncc-assets/SAC-N2K/UK0030386.pdf [Accessed November 2024].

JNCC (Joint Nature Conservation Committee), 2024. Solan Bank Reef. Available at: https://sac.jncc.gov.uk/site/UK0030386 [Accessed: November 2024].

Johnston A, Cook ASCP, Wright LJ, Humphreys EM, and Burton NHK, 2014. Modelling flight heights of marine birds to more accurately assess collision risk with offshore wind farms. Journal of Applied Ecology, 51(1): pp.31-41.

Kirschvink, JL, 1990. Geomagnetic sensitivity in cetaceans: an update with live stranding records in the United States, In Sensory Abilities of Cetaceans: Laboratory and Field Evidence (J.A. Thomas and R.A. Kastelein, eds.) Plenum Press, New York, NY. 639-649 pp.

Klinowska, M. 1990. Geomagnetic orientation in cetaceans: behavioral evidence, In Sensory Abilities of Cetaceans: Laboratory and Field Evidence (J.A. Thomas and R.A. Kastelein, eds.). Plenum Press. New York, NY. 651-663 pp.

Lindeboom, H. J., H. J. Kouwenhoven, M. J. N. Bergman, S. Bouma, S. Brasseur, R. Daan, R. C. Fijn, D. de Haan, S. Dirksen, R. van Hal, R. Hille Ris Lambers, R. ter Hofstede, K. L. Krijgsveld, M. Leopold, and M. Scheidat. 2011. Short-term ecological effects of an offshore wind farm in the Dutch coastal zone; a compilation. Environmental Research Letters 6:1-13.

Mendel B, Schwemmer P, Peschko V, Muller S, Schwemmer H, Mercker M, and Garthe S, 2019. Operational offshore wind farms and associated ship traffic cause profound changes in distribution patterns of Loons (*Gavia* spp.). Journal of Environmental Management, 231: pp.429-438.

Miles, W., Money, S., Luxmoore, R., and Furness, R.W., 2010. Effects or artificial lights and moonlight on petrels at St Kilda. Bird Study, 57(2): pp.244-251.

NatureScot, 2020. The Effect of Aviation Obstruction Lighting on Birds at Wind Turbines, Communication Towers and Other Structures. NatureScot Information Note.

NatureScot, 2023a. 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. Available online at: https://www.nature.scot/doc/guidance-note-3-guidance-support-offshore-wind-applications-marine-birds-identifying-theoretical [Accessed December 2024].

NatureScot, 2023b. Guidance Note 6: Guidance to support Offshore Wind Applications - Marine Ornithology Impact Pathways for Offshore Wind Developments. Available online at: https://www.nature.scot/doc/guidance-note-6-guidance-support-offshore-wind-applications-marine-ornithology-impact-pathways [Accessed December 2024].

Normandeau, Exponent, T. Tricas, and A. Gill. 2011. Effects of EMFs from Undersea Power Cables on Elasmobranchs and Other Marine Species. U.S. Dept. of the Interior, Bureau of Ocean Energy Management, Regulation, and Enforcement, Pacific OCS Region, Camarillo, CA. OCS Study BOEMRE 2011-09.

NSTA (North Sea Transition Authority), 2024. Offshore Activity. Available online at: https://www.arcgis.com/apps/webappviewer/index.html?id=f4b1ea5802944a55aa4a9df0184205a5 [Accessed October 2024].

Pigeault, R., Ruser, A., Ramírez-Martínez, N.C., Geelhoed, S.C., Haelters, J., Nachtsheim, D.A., Schaffeld, T., Sveegaard, S., Siebert, U. and Gilles, A., 2024. Maritime traffic alters distribution of the harbour porpoise in the North Sea. *Marine pollution bulletin*, *208*, p.116925.

PRAGD (The Particles Retrieval Advisory Group (Dounreay)), 2012. Particles Retrieval Advisory Group (Dounreay) 2012 Report. Available at: https://assets.publishing.service.gov.uk/media/5abce64ae5274a3f40243cbe/PRAGD_Dounreay-2012-report.pdf [Accessed January 2025].

Rodríguez, A., Holmes, N.D., Ryan, P.G., Wilson, K-J., Faulquier, L., Murillo, Y., Raine, A.F., Penniman, J.F., Neves, V., Rodríguez, B., Negro, J.J., Chiaradia, A., Dann, P., Anderson, T., Metzger, B., Shirai, M., Deppe, L., Wheeler, J., Hodum, P., Gouveia C., Carmo, V., Carreira, G.P., Delgado-Alburqueque, L., Guerra-Correa, C., Couzi, F-X., Travers, M., and Le Corre, M., 2017. Seabird mortality induced by land-based artificial lights.

Rodríguez, B., Suárez-Pérez, A., Méndez, C., Acosta, A., and Rodríguez, A., 2023. Numbers of seabirds attracted to artificial lights should not be the only indicator of population trends. *Animal Conservation*, 26(4): pp.425-427.

Russell, D. J., S. M. Brasseur, D. Thompson, G. D. Hastie, V. M. Janik, G. Aarts, B. T. McClintock, J. Matthiopoulos, S. E. Moss, and B. McConnell. 2014. Marine mammals trace anthropogenic structures at sea. Current Biology 24:R638-R639.

Scheidat, M., J. Tougaard, S. Brasseur, J. Carstensen, T. van Polanen Petel, J. Teilmann, and P. Reijnders. 2011. Harbour porpoises (*Phocoena phocoena*) and wind farms: a case study in the Dutch North Sea. Environmental Research Letters 6:1-10.

Thompson, D., Onoufriou, J., Brownlow, A., and Bishop, A., 2015. Preliminary report on predation by adult grey seals on grey seal pups as a possible explanation for corkscrew injury patterns seen in the unexplained seal deaths. Sea Mammal Research Unit report to Scottish Government, 15pp.

UK Gov (Government), 2021. Guidance: Habitats regulations assessments: protecting a European site. Available at: https://www.gov.uk/guidance/habitats-regulations-assessments-protecting-a-european-site [Accessed January 2025].

Wade HM, Masden EA, Jackson AC, and Furness RW, 2016. Incorporating data uncertainty when estimating potential vulnerability of Scottish seabirds to marine renewable energy developments. Marine Policy, 70: pp.108-113.

Walker, MM, Diebel, DE and Kirschvink JL, 2003. Detection and use of the earth's magnetic field by aquatic vertebrates, in Sensory Processing in the Aquatic Environment. S.P. Collin and N. Justin Marshall, eds. Springer-Verlag. NY. Pp. 53-74.

Weimerskirch, H., Chastel, O., Cherel, Y., Henden, J-A., and Tveraa, T., 2001. Nest attendance and foraging movements of northern fulmars rearing chicks at Bjørnøya Barents Sea. *Polar Biology*, 24: pp.83-88.

Wilson S.C., Trukhanova I., Dmitrieva L., Dolgova E., Crawford I., Baimukanov M., Baimukanov T., Ismagambetov B., Pazylbekov M., Jüssi M., and Goodman S.J., 2017. Assessment of impacts and potential mitigation for icebreaking vessels transiting pupping areas of an ice-breeding seal. Biological Conservation, 214: pp.213-222.

Woodward, I, Thaxter, CB, Owen, E, and Cook, ASCP, 2019. Desk-based revision of seabird foraging ranges used for HRA screening. BTO Research Report No. 724. British Trust for Ornithology, Thetford: 139pp.

Wright LJ, Ross-Smith VH, Austin GE, Massimino D, Dadam D, Cook ASCP, Calbrade NA, and Burton NHK, 2012. Assessing the risk of offshore wind farm development to migratory birds designated as features of UK Special Protection Areas (and other Annex 1 species). BTO Research Report No. 592. British Trust for Ornithology, Thetford.

APPENDIX A Details of Special Areas of Conservation or Sites of Community Importance with Harbour Porpoise Listed as a Qualifying Feature, and Located Within the West Scotland or North Sea Management Units

Site Name	Site Code	Management Unit	Distance to Offshore Cable Corridor Area of Search (km)	Distance to Array Area (km)
Inner Hebrides and the Minches	UK0030393	West Scotland	51.26	41.95
Skerries and Causeway	UK0030383	West Scotland	391.40	392.25
Southern North Sea	UK0030395	North Sea	428.95	559.16
Dogger bank	DE1003301	North Sea	536.00	645.54
Sylter Außenriff	DE1209301	North Sea	717.68	829.74
Borkum-Riffgrund	DE2104301	North Sea	775.78	883.16
NTP S-H Wattenmeer und angrenzende Küstengebiete	DE0916391	North Sea	797.07	912.04
Dünen- und Heidelandschaften Nord-Sylt	DE0916392	North Sea	818.79	933.97
Nationalpark Niedersächsisches Wattenmeer	DE2306301	North Sea	819.27	926.68
Dünen- und Heidelandschaften Nord- und Mittel-Sylt	DE1016392	North Sea	820.84	935.74
Dünenlandschaft Süd-Sylt	DE1115391	North Sea	824.02	938.64
Küsten- und Dünenlandschaften Amrums	DE1315391	North Sea	837.58	951.59

Site Name	Site Code	Management Unit	Distance to Offshore Cable Corridor Area of Search (km)	Distance to Array Area (km)
Helgoland mit Helgoländer Felssockel	DE1813391	North Sea	843.42	955.36
Steingrund	DE1714391	North Sea	849.15	961.39
Unterems und Außenems	DE2507331	North Sea	859.15	966.05
Untereider	DE1719391	North Sea	891.02	1,004.59
Schleswig-Holsteinisches Elbästuar und angrenzende Flächen	DE2323392	North Sea	909.18	1,021.38
Duingebieden inclusief Ijzermonding en Zwin.	BE2500001	North Sea	909.94	991.33
Unterelbe	DE2018331	North Sea	911.56	1,023.79
Unterweser	DE2316331	North Sea	913.18	1,024.10
Weser bei Bremerhaven	DE2417370	North Sea	923.21	1,034.05
Schelde- en Durmeëstuarium van de Nederlandse grens tot Gent	BE2300006	North Sea	938.41	1,025.65

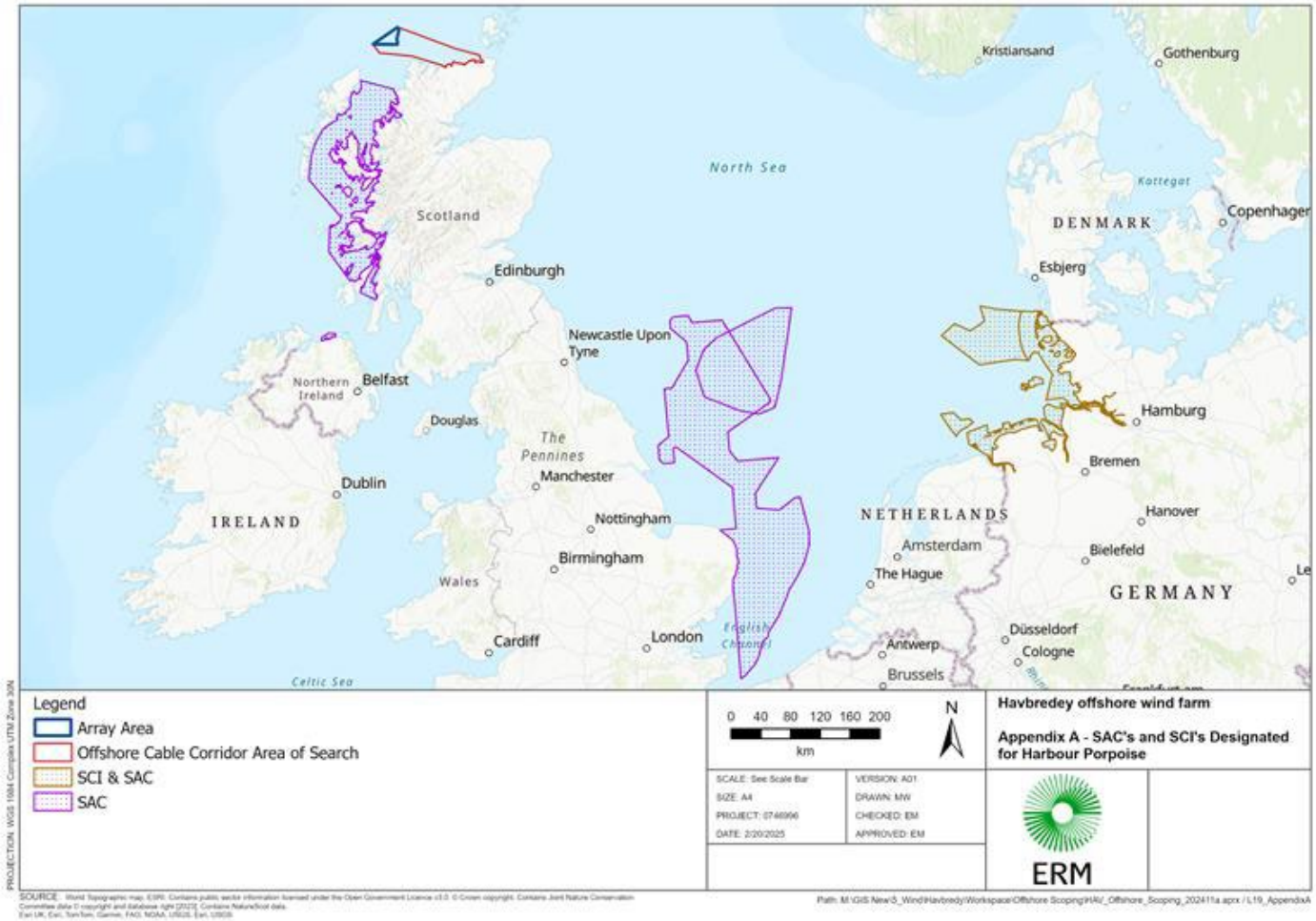

Figure 8.3-1 Special Areas of Conservation or Sites of Community Importance with Harbour Porpoise Listed as a Qualifying Feature, and Located Within the West Scotland or North Sea Management Units

APPENDIX B Details of SPAs and Ramsar Sites located within species-specific foraging range (Woodward *et al.*, 2019; NatureScot, 2023) or within 15 km (for non-breeding and fully marine sites) of the Array Area.

No LSE has been concluded for sites and features shaded in grey, where there is limited to no connectivity to sites outside the average species-specific foraging ranges (Woodward *et al.*, 2019; Bolton, 2021).

Site Code	Site Name	Distance (km)[18]	Common Name	Scientific Name	Foraging range (km)
UK9001011	North Rona and Sula Sgeir	22.6	Atlantic Puffin	*Fratercula arctica*	250.8
			Black-legged Kittiwake	*Rissa tridactyla*	300.6
			Common Guillemot	*Uria aalge*	95.2
			European Storm Petrel	*Hydrobates pelagicus*	336.0
			Great Black-backed Gull	*Larus marinus*	73.0
			Leach's Storm Petrel	*Hydrobates leucorhous*	657.0
			Northern Fulmar	*Fulmarus glacialis*	1,200.2
			Northern Gannet	*Morus bassanus*	509.4
			Razorbill	*Alca torda*	122.2
UK9001231	Cape Wrath	23.8	Atlantic Puffin	*Fratercula arctica*	250.8

[18] Distance is calculated as the shortest straight line distance from the Array Area boundary to the boundary of each SPA or Ramsar Site.

Site Code	Site Name	Distance (km)[18]	Common Name	Scientific Name	Foraging range (km)
			Black-legged Kittiwake	*Rissa tridactyla*	300.6
			Common Guillemot	*Uria aalge*	95.2
			Northern Fulmar	*Fulmarus glacialis*	1,200.2
			Razorbill	*Alca torda*	122.2
UK9001241	Handa	43.3	Black-legged Kittiwake	*Rissa tridactyla*	300.6
			Common Guillemot	*Uria aalge*	95.2
			Great Skua	*Stercorarius skua*	931.2
			Northern Fulmar	*Fulmarus glacialis*	1,200.2
			Razorbill	*Alca torda*	122.2
UK9002181	Sule Skerry and Sule Stack	45.0	Atlantic Puffin	*Fratercula arctica*	250.8
			Common Guillemot	*Uria aalge*	153.7
			European Storm Petrel	*Hydrobates pelagicus*	336.0
			Leach's Storm Petrel	*Hydrobates leucorhous*	657.0
			Northern Gannet	*Morus bassanus*	509.4
UK9001181	North Caithness Cliffs	85.9	Atlantic Puffin	*Fratercula arctica*	250.8

Site Code	Site Name	Distance (km)[18]	Common Name	Scientific Name	Foraging range (km)
			Black-legged Kittiwake	*Rissa tridactyla*	300.6
			Common Guillemot	*Uria aalge*	95.2
			Northern Fulmar	*Fulmarus glacialis*	1,200.2
			Razorbill	*Alca torda*	122.2
UK9001041	Shiant Isles	98.2	Atlantic Puffin	*Fratercula arctica*	250.8
			Black-legged Kittiwake	*Rissa tridactyla*	300.6
			Northern Fulmar	*Fulmarus glacialis*	1,200.2
			Razorbill	*Alca torda*	122.2
UK9002141	Hoy	106.6	Atlantic Puffin	*Fratercula arctica*	250.8
			Black-legged Kittiwake	*Rissa tridactyla*	300.6
			Common Guillemot	*Uria aalge*	153.7
			Great Skua	*Stercorarius skua*	931.2
			Northern Fulmar	*Fulmarus glacialis*	1,200.2
UK9001021	Flannan Isles	107.7	Atlantic Puffin	*Fratercula arctica*	250.8
			Black-legged Kittiwake	*Rissa tridactyla*	300.6

Site Code	Site Name	Distance (km)[18]	Common Name	Scientific Name	Foraging range (km)
			Leach's Storm Petrel	*Hydrobates leucorhous*	657.0
			Northern Fulmar	*Fulmarus glacialis*	1,200.2
			Razorbill	*Alca torda*	122.2
UK9002121	Marwick Head	112.6	Black-legged Kittiwake	*Rissa tridactyla*	300.6
			Common Guillemot	*Uria aalge*	153.7
UK9020332	Seas off St Kilda	125.0	Atlantic Puffin	*Fratercula arctica*	250.8
			European Storm Petrel	*Hydrobates pelagicus*	336.0
			Northern Fulmar	*Fulmarus glacialis*	1,200.2
			Northern Gannet	*Morus bassanus*	509.4
UK9001182	East Caithness Cliffs	125.2	Black-legged Kittiwake	*Rissa tridactyla*	300.6
			Northern Fulmar	*Fulmarus glacialis*	1,200.2
UK9002371	Rousay	126.2	Black-legged Kittiwake	*Rissa tridactyla*	300.6
			Common Guillemot	*Uria aalge*	153.7

Site Code	Site Name	Distance (km)[18]	Common Name	Scientific Name	Foraging range (km)
			Northern Fulmar	*Fulmarus glacialis*	1,200.2
UK9002101	West Westray	132.7	Black-legged Kittiwake	*Rissa tridactyla*	300.6
			Common Guillemot	*Uria aalge*	153.7
			Northern Fulmar	*Fulmarus glacialis*	1,200.2
			Razorbill	*Alca torda*	164.6
UK9002151	Copinsay	148.5	Black-legged Kittiwake	*Rissa tridactyla*	300.6
			Common Guillemot	*Uria aalge*	153.7
			Northern Fulmar	*Fulmarus glacialis*	1,200.2
UK9002431	Calf of Eday	148.5	Northern Fulmar	*Fulmarus glacialis*	1,200.2
			Black-legged Kittiwake	*Rissa tridactyla*	300.6
			Common Guillemot	*Uria aalge*	153.7
UK9020331	Seas off Foula	173.5	Atlantic Puffin	*Fratercula arctica*	250.8
			Great Skua	*Stercorarius skua*	931.2
			Northern Fulmar	*Fulmarus glacialis*	1,200.2

Site Code	Site Name	Distance (km)[18]	Common Name	Scientific Name	Foraging range (km)
UK9001031	St Kilda	176.6	Atlantic Puffin	*Fratercula arctica*	250.8
			Black-legged Kittiwake	*Rissa tridactyla*	300.6
			European Storm Petrel	*Hydrobates pelagicus*	336.0
			Great Skua	*Stercorarius skua*	931.2
			Leach's Storm Petrel	*Hydrobates leucorhous*	657.0
			Manx Shearwater	*Puffinus puffinus*	2,365.5
			Northern Fulmar	*Fulmarus glacialis*	1,200.2
			Northern Gannet	*Morus bassanus*	709.0
UK9001341	Rum	188.7	Black-legged Kittiwake	*Rissa tridactyla*	300.6
			Manx Shearwater	*Puffinus puffinus*	2,365.5
UK9001431	Canna and Sanday	192.5	Atlantic Puffin	*Fratercula arctica*	250.8
			Black-legged Kittiwake	*Rissa tridactyla*	300.6
UK9002471	Troup, Pennan and Lion's Heads	213.8	Black-legged Kittiwake	*Rissa tridactyla*	300.6
			Northern Fulmar	*Fulmarus glacialis*	1,200.2

Site Code	Site Name	Distance (km)[18]	Common Name	Scientific Name	Foraging range (km)
UK9002091	Fair Isle	215.0	Atlantic Puffin	*Fratercula arctica*	250.8
			Black-legged Kittiwake	*Rissa tridactyla*	300.6
			Great Skua	*Stercorarius skua*	931.2
			Northern Fulmar	*Fulmarus glacialis*	1,200.2
			Northern Gannet	*Morus bassanus*	509.4
UK9002061	Foula	218.1	Atlantic Puffin	*Fratercula arctica*	250.8
			Black-legged Kittiwake	*Rissa tridactyla*	300.6
			Great Skua	*Stercorarius skua*	931.2
			Leach's Storm Petrel	*Hydrobates leucorhous*	657.0
			Northern Fulmar	*Fulmarus glacialis*	1,200.2
UK13054	Ronas Hill - North Roe and Tingon Ramsar Site	230.3	Great Skua	*Stercorarius skua*	931.2
			Northern Fulmar	*Fulmarus glacialis*	1,200.2
UK9001121	Mingulay and Berneray	237.2	Atlantic Puffin	*Fratercula arctica*	250.8
			Black-legged Kittiwake	*Rissa tridactyla*	300.6

Site Code	Site Name	Distance (km)[18]	Common Name	Scientific Name	Foraging range (km)
			Northern Fulmar	*Fulmarus glacialis*	1,200.2
UK9002511	Sumburgh Head	247.2	Black-legged Kittiwake	*Rissa tridactyla*	300.6
			Northern Fulmar	*Fulmarus glacialis*	1,200.2
UK9002491	Buchan Ness to Collieston Coast	255.1	Black-legged Kittiwake	*Rissa tridactyla*	300.6
			Northern Fulmar	*Fulmarus glacialis*	1,200.2
UK9002081	Noss	272.2	Black-legged Kittiwake	*Rissa tridactyla*	300.6
			Great Skua	*Stercorarius skua*	931.2
			Northern Fulmar	*Fulmarus glacialis*	1,200.2
			Northern Gannet	*Morus bassanus*	509.4
UK9002271	Fowlsheugh	278.2	Black-legged Kittiwake	*Rissa tridactyla*	300.6
			Northern Fulmar	*Fulmarus glacialis*	1,200.2
UK9003171	North Colonsay and Western Cliffs	294.1	Black-legged Kittiwake	*Rissa tridactyla*	300.6

Site Code	Site Name	Distance (km)[18]	Common Name	Scientific Name	Foraging range (km)
UK9020316	Outer Firth of Forth and St Andrews Bay Complex	297.0	Black-legged Kittiwake	*Rissa tridactyla*	300.6
			Manx Shearwater	*Puffinus puffinus*	2,365.5
			Northern Gannet	*Morus bassanus*	509.4
UK9002031	Fetlar	299.8	Great Skua	*Stercorarius skua*	931.2
			Northern Fulmar	*Fulmarus glacialis*	1,200.2
UK9002011	Hermaness, Saxa Vord and Valla Field	313.0	Great Skua	*Stercorarius skua*	931.2
			Northern Fulmar	*Fulmarus glacialis*	1,200.2
			Northern Gannet	*Morus bassanus*	509.4
UK9004171	Forth Islands	331.2	Northern Gannet	*Morus bassanus*	590.0
IE0004100	Inishtrahull SPA	380.1	Northern Fulmar	*Fulmarus glacialis*	1,200.2
UK9003091	Ailsa Craig	391.8	Northern Gannet	*Morus bassanus*	509.4
IE0004194	Horn Head to Fanad Head SPA	404.3	Northern Fulmar	*Fulmarus glacialis*	1,200.2
IE0004073	Tory Island SPA	415.2	Northern Fulmar	*Fulmarus glacialis*	1,200.2
IE0004150	West Donegal Coast SPA	433.9	Northern Fulmar	*Fulmarus glacialis*	1,200.2

Site Code	Site Name	Distance (km)[18]	Common Name	Scientific Name	Foraging range (km)
UK12018	Outer Ards Ramsar Site	436.9	Manx Shearwater	*Puffinus puffinus*	2,365.5
IE0004068	Inishmurray SPA	512.3	Northern Fulmar	*Fulmarus glacialis*	1,200.2
IE0004133	Aughris Head SPA	531.1	Northern Fulmar	*Fulmarus glacialis*	1,200.2
IE0004072	Stags of Broad Haven SPA	545.9	Leach's Storm Petrel	*Hydrobates leucorhous*	657.0
			Northern Fulmar	*Fulmarus glacialis*	1,200.2
IE0004004	Inishkea Islands SPA	577.7	Northern Fulmar	*Fulmarus glacialis*	1,200.2
IE0004122	Skerries Islands SPA	578.7	Northern Fulmar	*Fulmarus glacialis*	1,200.2
IE0004111	Duvillaun Islands SPA	583.3	Northern Fulmar	*Fulmarus glacialis*	1,200.2
IE0004069	Lambay Island SPA	588.1	Manx Shearwater	*Puffinus puffinus*	2,365.5
			Northern Fulmar	*Fulmarus glacialis*	1,200.2
IE0004117	Ireland's Eye SPA	598.3	Northern Fulmar	*Fulmarus glacialis*	1,200.2
IE0004113	Howth Head Coast SPA	600.8	Northern Fulmar	*Fulmarus glacialis*	1,200.2

Site Code	Site Name	Distance (km)[18]	Common Name	Scientific Name	Foraging range (km)
IE0004177	Bills Rocks SPA	607.0	Northern Fulmar	*Fulmarus glacialis*	1,200.2
IE0004144	High Island, Inishshark and Davillaun SPA	630.3	Manx Shearwater	*Puffinus puffinus*	2,365.5
			Northern Fulmar	*Fulmarus glacialis*	1,200.2
IE0004170	Cruagh Island SPA	642.8	Manx Shearwater	*Puffinus puffinus*	2,365.5
IE0004127	Wicklow Head SPA	646.7	Northern Fulmar	*Fulmarus glacialis*	1,200.2
UK9013121	Glannau Aberdaron ac Ynys Enlli/ Aberdaron Coast and Bardsey Island	662.1	Manx Shearwater	*Puffinus puffinus*	2,365.5
IE0004152	Inishmore SPA	671.4	Northern Fulmar	*Fulmarus glacialis*	1,200.2
IE0004005	Cliffs of Moher SPA	679.5	Northern Fulmar	*Fulmarus glacialis*	1,200.2
IE0004114	Illaunonearaun SPA	723.1	Northern Fulmar	*Fulmarus glacialis*	1,200.2
IE0004119	Loop Head SPA	734.3	Northern Fulmar	*Fulmarus glacialis*	1,200.2
IE0004002	Saltee Islands SPA	740.1	Manx Shearwater	*Puffinus puffinus*	2,365.5
			Northern Fulmar	*Fulmarus glacialis*	1,200.2

Site Code	Site Name	Distance (km)[18]	Common Name	Scientific Name	Foraging range (km)
IE0004189	Kerry Head SPA	741.9	Northern Fulmar	*Fulmarus glacialis*	1,200.2
IE0004192	Helvick Head to Ballyquin SPA	755.8	Northern Fulmar	*Fulmarus glacialis*	1,200.2
IE0004125	Magharee Islands SPA	760.0	Northern Fulmar	*Fulmarus glacialis*	1,200.2
IE0004153	Dingle Peninsula SPA	766.9	Northern Fulmar	*Fulmarus glacialis*	1,200.2
UK9014051	Skomer, Skokholm and the Seas off Pembrokeshire / Sgomer, Sgogwm a Moroedd Penfro	780.1	Manx Shearwater	*Puffinus puffinus*	2,365.5
IE0004154	Iveragh Peninsula SPA	792.4	Northern Fulmar	*Fulmarus glacialis*	1,200.2
IE0004008	Blasket Islands SPA	795.4	Manx Shearwater	*Puffinus puffinus*	2,365.5
			Northern Fulmar	*Fulmarus glacialis*	1,200.2
IE0004021	Old Head of Kinsale SPA	814.9	Northern Fulmar	*Fulmarus glacialis*	1,200.2
IE0004003	Puffin Island SPA	822.8	Manx Shearwater	*Puffinus puffinus*	2,365.5
			Northern Fulmar	*Fulmarus glacialis*	1,200.2

Site Code	Site Name	Distance (km)[18]	Common Name	Scientific Name	Foraging range (km)
IE0004190	Galley Head to Duneen Point SPA	823.9	Northern Fulmar	*Fulmarus glacialis*	1,200.2
IE0004175	Deenish Island and Scariff Island SPA	829.4	Manx Shearwater	*Puffinus puffinus*	2,365.5
			Northern Fulmar	*Fulmarus glacialis*	1,200.2
IE0004155	Beara Peninsula SPA	829.8	Northern Fulmar	*Fulmarus glacialis*	1,200.2
IE0004007	Skelligs SPA	831.3	Manx Shearwater	*Puffinus puffinus*	2,365.5
			Northern Fulmar	*Fulmarus glacialis*	1,200.2
IE0004156	Sheep's Head to Toe Head SPA	837.1	Northern Fulmar	*Fulmarus glacialis*	1,200.2
IE0004066	The Bull and The Cow Rocks SPA	847.0	Northern Fulmar	*Fulmarus glacialis*	1,200.2
DE1813491	Seevogelschutzgebiet Helgoland	942.5	Northern Fulmar	*Fulmarus glacialis*	1,200.2
FR2310045	Littoral seino-marin	1,043.7	Northern Fulmar	*Fulmarus glacialis*	1,200.2
FR2510099	Falaise du Bessin Occidental	1,081.7	Northern Fulmar	*Fulmarus glacialis*	1,200.2
FR5310011	Cote de Granit Rose-Sept Iles	1,091.2	Manx Shearwater	*Puffinus puffinus*	2,365.5
			Northern Fulmar	*Fulmarus glacialis*	1,200.2

Site Code	Site Name	Distance (km)[18]	Common Name	Scientific Name	Foraging range (km)
FR5310070	Tregor Goëlo	1,092.1	Northern Fulmar	*Fulmarus glacialis*	1,200.2
FR5310073	Baie de Morlaix	1,115.1	Manx Shearwater	*Puffinus puffinus*	2,365.5
FR5310095	Cap d'Erquy-Cap Fréhel	1,125.7	Northern Fulmar	*Fulmarus glacialis*	1,200.2
FR5310072	Ouessant-Molène	1,143.7	Manx Shearwater	*Puffinus puffinus*	2,365.5
			Northern Fulmar	*Fulmarus glacialis*	1,200.2

APPENDIX C Details of SPAs and Ramsar Sites located within 50 km of the Offshore Cable Corridor Area of Search, including the screening distance applied to each qualifying feature.

No LSE is concluded for sites and features shaded in grey, where there is limited to no connectivity due to the site being outside the species foraging ranges (Woodward *et al.*, 2019) or outside the 15 km buffer applied to non-breeding and intertidal features, or where there is limited to no impact to migration pathways for terrestrial features.

Site Code	Site Name	Distance (km)[19]	Common Name	Scientific Name	Screening Distance (km)
UK9001181	North Caithness Cliffs	0.0	Atlantic Puffin	*Fratercula arctica*	265.4
			Black-legged Kittiwake	*Rissa tridactyla*	300.6
			Common Guillemot	*Uria aalge*	95.2
			Northern Fulmar	*Fulmarus glacialis*	1,200.2
			Peregrine Falcon	*Falco peregrinus*	0.0
			Razorbill	*Alca torda*	122.2
UK9001211	North Sutherland Coastal Islands	0.1	Barnacle Goose	*Branta leucopsis*	15.0
UK9001231	Cape Wrath	0.6	Atlantic Puffin	*Fratercula arctica*	265.4
			Black-legged Kittiwake	*Rissa tridactyla*	300.6
			Common Guillemot	*Uria aalge*	95.2
			Northern Fulmar	*Fulmarus glacialis*	1,200.2

[19] Distance is calculated as the shortest straight line distance from the Offshore Cable Corridor Area of Search boundary to the boundary of each SPA or Ramsar Site.

Site Code	Site Name	Distance (km)[19]	Common Name	Scientific Name	Screening Distance (km)
			Razorbill	*Alca torda*	122.2
UK13003	Caithness and Sutherland Peatlands Ramsar Site	1.4	Arctic skua	*Stercorarius parasiticus*	2.7
			Black-throated diver	*Gavia arctica*	15.0
			Common scoter	*Melanitta nigra*	15.0
			Common greenshank	*Tringa nebularia*	15.0
			Dunlin	*Calidris alpina schinzii*	15.0
			Eurasian curlew	*Numenius arquata*	15.0
			Eurasian teal	*Anas crecca*	15.0
			Eurasian wigeon	*Anas penelope*	15.0
			European golden plover	*Pluvialis apricaria*	15.0
			Golden eagle	*Aquila chrysaetos*	0.0
			Greylag goose	*Anser anser*	15.0
			Greylag goose	*Anser anser*	15.0
			Hen harrier	*Circus cyaneus*	0.0
			Merlin	*Falco columbarius*	0.0
			Red-throated diver	*Gavia stellata*	9.0
			Short-eared owl	*Asio flammeus*	0.0

Site Code	Site Name	Distance (km)[19]	Common Name	Scientific Name	Screening Distance (km)
			Wood sandpiper	*Tringa glareola*	15.0
UK9001151	Caithness and Sutherland Peatlands	1.4	Black-throated Diver	*Gavia arctica*	15.0
			Common Greenshank	*Tringa nebularia*	15.0
			Common Scoter	*Melanitta nigra*	15.0
			Dunlin	*Calidris alpina schinzii*	15.0
			Eurasian Wigeon	*Anas penelope*	15.0
			European Golden Plover	*Pluvialis apricaria*	15.0
			Golden Eagle	*Aquila chrysaetos*	0.0
			Hen Harrier	*Circus cyaneus*	0.0
			Merlin	*Falco columbarius*	0.0
			Red-throated Diver	*Gavia stellata*	9.0
			Short-eared Owl	*Asio flammeus*	0.0
			Wood Sandpiper	*Tringa glareola*	15.0
UK9001171	Caithness Lochs	3.0	Greater White-fronted Goose	*Anser albifrons flavirostris*	15.0
			Greylag Goose	*Anser anser*	15.0
			Whooper Swan	*Cygnus cygnus*	15.0
UK13004		3.1	Greenland white-fronted goose	*Anser albifrons flavirostris*	15.0

Site Code	Site Name	Distance (km)[19]	Common Name	Scientific Name	Screening Distance (km)
	Caithness Lochs Ramsar Site		Greylag goose	*Anser anser*	15.0
			Ruff	*Philomachus pugnax*	15.0
			Whooper swan	*Cygnus cygnus*	15.0
UK9002141	Hoy	10.6	Atlantic Puffin	*Fratercula arctica*	265.4
			Black-legged Kittiwake	*Rissa tridactyla*	300.6
			Common Guillemot	*Uria aalge*	153.7
			Great Black-backed Gull	*Larus marinus*	73.0
			Great Skua	*Stercorarius skua*	931.2
			Northern Fulmar	*Fulmarus glacialis*	1,200.2
			Arctic Skua	*Stercorarius parasiticus*	2.7
			Peregrine Falcon	*Falco peregrinus*	0.0
			Red-throated Diver	*Gavia stellata*	9.0
UK9002181	Sule Skerry and Sule Stack	15.2	Atlantic Puffin	*Fratercula arctica*	265.4
			Common Guillemot	*Uria aalge*	153.7
			European Shag	*Gulosus aristotelis*	23.7
			European Storm Petrel	*Hydrobates pelagicus*	336.0

Site Code	Site Name	Distance (km)[19]	Common Name	Scientific Name	Screening Distance (km)
			Leach's Storm Petrel	*Oceanodroma leucorhoa*	657.0
			Northern Gannet	*Morus bassanus*	509.4
UK9020321	Scapa Flow	15.3	Black-throated Diver	*Gavia arctica*	15.0
			Common Eider	*Somateria mollissima*	15.0
			Great Northern Diver	*Gavia immer*	15.0
			European Shag	*Gulosus aristotelis*	15.0
			Slavonian Grebe	*Podiceps auritus*	15.0
			Long-tailed Duck	*Clangula hyemalis*	15.0
			Red-breasted Merganser	*Mergus serrator*	15.0
			Red-throated Diver	*Gavia stellata*	9.0
UK9020306	Foinaven	17.5	Golden Eagle	*Aquila chrysaetos*	0.0
UK9001131	Pentland Firth Islands	20.5	Arctic Tern	*Sterna paradisaea*	40.5
UK9002891	Switha	22.3	Barnacle Goose	*Branta leucopsis*	15.0
UK9001011	North Rona and Sula Sgeir	22.5	Atlantic Puffin	*Fratercula arctica*	265.4
			Black-legged Kittiwake	*Rissa tridactyla*	300.6
			Common Guillemot	*Uria aalge*	95.2

Site Code	Site Name	Distance (km)[19]	Common Name	Scientific Name	Screening Distance (km)
			European Storm Petrel	*Hydrobates pelagicus*	336.0
			Great Black-backed Gull	*Larus marinus*	73.0
			Leach's Storm Petrel	*Oceanodroma leucorhoa*	657.0
			Northern Fulmar	*Fulmarus glacialis*	1,200.2
			Northern Gannet	*Morus bassanus*	509.4
			Razorbill	*Alca torda*	122.2
UK9001182	East Caithness Cliffs	25.2	Black-legged Kittiwake	*Rissa tridactyla*	300.6
			Common Guillemot	*Uria aalge*	95.2
			European Herring Gull	*Larus argentatus*	85.6
			European Shag	*Gulosus aristotelis*	23.7
			Great Black-backed Gull	*Larus marinus*	73.0
			Great Cormorant	*Phalacrocorax carbo*	33.9
			Northern Fulmar	*Fulmarus glacialis*	1,200.2
			Peregrine Falcon	*Falco peregrinus*	0.0
			Razorbill	*Alca torda*	122.2
UK9001241	Handa	28.6	Black-legged Kittiwake	*Rissa tridactyla*	300.6
			Common Guillemot	*Uria aalge*	95.2

Site Code	Site Name	Distance (km)[19]	Common Name	Scientific Name	Screening Distance (km)
			Great Skua	*Stercorarius skua*	931.2
			Northern Fulmar	*Fulmarus glacialis*	1,200.2
			Razorbill	*Alca torda*	122.2
UK9002311	Orkney Mainland Moors	31.8	Hen Harrier	*Circus cyaneus*	0.0
			Hen Harrier	*Circus cyaneus*	0.0
			Red-throated Diver	*Gavia stellata*	9.0
			Short-eared Owl	*Asio flammeus*	0.0
UK9001741	Ness and Barvas, Lewis	34.5	Corn Crake	*Crex crex*	15.0
UK13028	Lewis Peatlands Ramsar Site	36.5	Arctic skua	*Stercorarius parasiticus*	2.7
			Dunlin	*Calidris alpina schinzii*	15.0
UK9001571	Lewis Peatlands	36.5	Black-throated Diver	*Gavia arctica*	15.0
			Common Greenshank	*Tringa nebularia*	15.0
			Dunlin	*Calidris alpina schinzii*	15.0
			European Golden Plover	*Pluvialis apricaria*	15.0
			Golden Eagle	*Aquila chrysaetos*	0.0
			Merlin	*Falco columbarius*	0.0

Site Code	Site Name	Distance (km)[19]	Common Name	Scientific Name	Screening Distance (km)
			Red-throated Diver	*Gavia stellata*	9.0
UK9020314	North Orkney	40.2	Common Diver	*Gavia immer*	15.0
			Slavonian Grebe	*Podiceps auritus*	15.0
			Red-throated Diver	*Gavia stellata*	9.0
			Velvet Scoter	*Melanitta fusca*	15.0
UK9002121	Marwick Head	44.6	Black-legged Kittiwake	*Rissa tridactyla*	300.6
			Common Guillemot	*Uria aalge*	153.7
UK9002151	Copinsay	45.1	Black-legged Kittiwake	*Rissa tridactyla*	300.6
			Common Guillemot	*Uria aalge*	153.7
			Great Black-backed Gull	*Larus marinus*	73.0
			Northern Fulmar	*Fulmarus glacialis*	1,200.2
UK9020313	Moray Firth	46.5	Common Eider	*Somateria mollissima*	15.0
			Common Goldeneye	*Bucephala clangula*	15.0
			Common Diver	*Gavia immer*	15.0
			Common Scoter	*Melanitta nigra*	15.0
			European Shag	*Gulosus aristotelis*	23.7
			European Shag	*Gulosus aristotelis*	15.0
			Greater Scaup	*Aythya marila*	15.0

Site Code	Site Name	Distance (km)[19]	Common Name	Scientific Name	Screening Distance (km)
			Slavonian Grebe	*Podiceps auritus*	15.0
			Long-tailed Duck	*Clangula hyemalis*	15.0
			Red-breasted Merganser	*Mergus serrator*	15.0
			Red-throated Diver	*Gavia stellata*	15.0
			Velvet Scoter	*Melanitta fusca*	15.0
UK9001611	Lairg and Strath Brora Lochs	47.4	Black-throated Diver	*Gavia arctica*	15.0
UK9001591	Assynt Lochs	48.5	Black-throated Diver	*Gavia arctica*	15.0

APPENDIX D Summary of SPAs and Ramsar Sites and their Qualifying Features for which LSE could not be excluded during the screening exercise

Site	Qualifying Feature	Pathway to LSEs[20]						
		1	2	3	4	5	6	7
North Rona and Sula Sgeir SPA	Black-legged Kittiwake	■	■				■	■
North Rona and Sula Sgeir SPA	Great Black-backed Gull	■					■	
North Rona and Sula Sgeir SPA	Common Guillemot		■	■		■	■	■
North Rona and Sula Sgeir SPA	Razorbill		■	■		■	■	■
North Rona and Sula Sgeir SPA	Atlantic Puffin		■	■	■	■	■	■
North Rona and Sula Sgeir SPA	European Storm Petrel	■	■		■		■	■
North Rona and Sula Sgeir SPA	Leach's Storm Petrel	■	■		■		■	■
North Rona and Sula Sgeir SPA	Northern Fulmar	■	■		■		■	
North Rona and Sula Sgeir SPA	Northern Gannet	■	■			■	■	■
Cape Wrath SPA	Black-legged Kittiwake	■	■				■	■
Cape Wrath SPA	Common Guillemot			■		■	■	■
Cape Wrath SPA	Razorbill		■	■		■	■	■

[20] Pressure numbering: **1** collision (with project infrastructure); **2** distributional responses (displacement and barrier effect); **3** vessel-related disturbance; **4** Artificial Light at Night (ALAN); **5** entanglement; **6** toxic contamination and pollution events; **7** habitat loss (including prey availability). Colour coding: ■ Array Area only; ■ Offshore Cable Corridor Area of Search only; ■ full Offshore Project area; ■ Array Area only during migration.

Site	Qualifying Feature	Pathway to LSEs[20]						
		1	2	3	4	5	6	7
Cape Wrath SPA	Atlantic Puffin		■	■	■	■	■	■
Cape Wrath SPA	Northern Fulmar	■	■		■		■	
Handa SPA	Black-legged Kittiwake	■	■				■	■
Handa SPA	Great Skua	■					■	
Handa SPA	Common Guillemot		■	■		■	■	■
Handa SPA	Razorbill		■	■		■	■	■
Handa SPA	Northern Fulmar	■	■		■	■	■	
Sule Skerry and Sule Stack SPA	Common Guillemot		■	■		■	■	■
Sule Skerry and Sule Stack SPA	Atlantic Puffin		■	■	■	■	■	■
Sule Skerry and Sule Stack SPA	European Storm Petrel	■	■		■		■	■
Sule Skerry and Sule Stack SPA	Leach's Storm Petrel	■	■		■		■	■
Sule Skerry and Sule Stack SPA	Northern Gannet	■	■			■	■	■
North Caithness Cliffs SPA	Black-legged Kittiwake	■	■				■	■
North Caithness Cliffs SPA	Common Guillemot		■	■		■	■	■
North Caithness Cliffs SPA	Razorbill		■	■		■	■	■
North Caithness Cliffs SPA	Atlantic Puffin		■	■	■	■	■	■
North Caithness Cliffs SPA	Northern Fulmar	■	■		■		■	

Site	Qualifying Feature	Pathway to LSEs[20]						
		1	2	3	4	5	6	7
North Caithness Cliffs SPA	Peregrine Falcon							
North Sutherland Coastal Islands SPA	Barnacle Goose							
Caithness and Sutherland Peatlands Ramsar Site	Greylag Goose							
Caithness and Sutherland Peatlands Ramsar Site	Eurasian Wigeon							
Caithness and Sutherland Peatlands Ramsar Site	Eurasian Teal							
Caithness and Sutherland Peatlands Ramsar Site	Common Scoter							
Caithness and Sutherland Peatlands Ramsar Site	European Golden Plover							
Caithness and Sutherland Peatlands Ramsar Site	Eurasian Curlew							
Caithness and Sutherland Peatlands Ramsar Site	Dunlin							
Caithness and Sutherland Peatlands Ramsar Site	Wood Sandpiper							
Caithness and Sutherland Peatlands Ramsar Site	Common Greenshank							
Caithness and Sutherland Peatlands Ramsar Site	Arctic Skua							

Site	Qualifying Feature	Pathway to LSEs[20]						
		1	2	3	4	5	6	7
Caithness and Sutherland Peatlands Ramsar Site	Red-throated Diver							
Caithness and Sutherland Peatlands Ramsar Site	Black-throated Diver							
Caithness and Sutherland Peatlands Ramsar Site	Short-eared Owl							
Caithness and Sutherland Peatlands Ramsar Site	Merlin							
Caithness and Sutherland Peatlands SPA	Eurasian Wigeon							
Caithness and Sutherland Peatlands SPA	Common Scoter							
Caithness and Sutherland Peatlands SPA	European Golden Plover							
Caithness and Sutherland Peatlands SPA	Dunlin							
Caithness and Sutherland Peatlands SPA	Wood Sandpiper							
Caithness and Sutherland Peatlands SPA	Common Greenshank							
Caithness and Sutherland Peatlands SPA	Red-throated Diver							
Caithness and Sutherland Peatlands SPA	Black-throated Diver							
Caithness and Sutherland Peatlands SPA	Short-eared Owl							
Caithness and Sutherland Peatlands SPA	Merlin							
Caithness Lochs SPA	Greylag Goose							

Site	Qualifying Feature	Pathway to LSEs[20]						
		1	2	3	4	5	6	7
Caithness Lochs SPA	Greater White-fronted Goose							
Caithness Lochs SPA	Whooper Swan							
Caithness Lochs Ramsar Site	Greylag Goose							
Caithness Lochs Ramsar Site	Greater White-fronted Goose							
Caithness Lochs Ramsar Site	Whooper Swan							
Caithness Lochs Ramsar Site	Ruff							
Shiant Isles SPA	Black-legged Kittiwake							
Shiant Isles SPA	Razorbill							
Shiant Isles SPA	Atlantic Puffin							
Shiant Isles SPA	Northern Fulmar							
Hoy SPA	Black-legged Kittiwake							
Hoy SPA	Great Skua							
Hoy SPA	Arctic Skua							
Hoy SPA	Common Guillemot							
Hoy SPA	Atlantic Puffin							
Hoy SPA	Northern Fulmar							

Site	Qualifying Feature	Pathway to LSEs[20]						
		1	2	3	4	5	6	7
Scapa Flow SPA	Slavonian Grebe							
Pentland Firth Islands SPA	Arctic Tern							
Switha SPA	Barnacle Goose							
Flannan Isles SPA	Black-legged Kittiwake							
Flannan Isles SPA	Razorbill							
Flannan Isles SPA	Atlantic Puffin							
Flannan Isles SPA	Leach's Storm Petrel							
Flannan Isles SPA	Northern Fulmar							
Marwick Head SPA	Black-legged Kittiwake							
Marwick Head SPA	Common Guillemot							
Seas off St Kilda SPA	Atlantic Puffin							
Seas off St Kilda SPA	European Storm Petrel							
Seas off St Kilda SPA	Leach's Storm Petrel							
Seas off St Kilda SPA	Northern Fulmar							
Seas off St Kilda SPA	Northern Gannet							
East Caithness Cliffs SPA	Black-legged Kittiwake							

Site	Qualifying Feature	Pathway to LSEs[20]						
		1	2	3	4	5	6	7
East Caithness Cliffs SPA	Northern Fulmar							
East Caithness Cliffs SPA	Great Cormorant							
Lewis Peatland Ramsar Site	Dunlin							
Lewis Peatlands SPA	European Golden Plover							
Lewis Peatlands SPA	Dunlin							
Lewis Peatlands SPA	Merlin							
Rousay SPA	Black-legged Kittiwake							
Rousay SPA	Common Guillemot							
Rousay SPA	Northern Fulmar							
West Westray SPA	Black-legged Kittiwake							
West Westray SPA	Common Guillemot							
West Westray SPA	Razorbill							
West Westray SPA	Northern Fulmar							
Orkney Mainland Moors SPA	Short-eared Owl							
North Orkney SPA	Slavonian Grebe							
Moray Firth SPA	Greater Scaup							
Moray Firth SPA	Common Scoter							

Site	Qualifying Feature	Pathway to LSEs[20]						
		1	2	3	4	5	6	7
Moray Firth SPA	Slavonian Grebe							
Copinsay SPA	Black-legged Kittiwake							
Copinsay SPA	Common Guillemot							
Copinsay SPA	Northern Fulmar							
Calf of Eday SPA	Black-legged Kittiwake							
Calf of Eday SPA	Common Guillemot							
Calf of Eday SPA	Northern Fulmar							
Seas off Foula SPA	Great Skua							
Seas off Foula SPA	Atlantic Puffin							
Seas off Foula SPA	Northern Fulmar							
St Kilda SPA	Black-legged Kittiwake							
St Kilda SPA	Great Skua							
St Kilda SPA	Atlantic Puffin							
St Kilda SPA	Northern Fulmar							
St Kilda SPA	Manx Shearwater							
St Kilda SPA	Northern Gannet							

Site	Qualifying Feature	Pathway to LSEs[20]						
		1	2	3	4	5	6	7
Rum SPA	Black-legged Kittiwake	■	■				■	■
Rum SPA	Black-legged Kittiwake	■	■				■	■
Canna and Sanday SPA	Atlantic Puffin		■	■	■	■	■	■
Canna and Sanday SPA	Manx Shearwater	■	■		■		■	
Troup, Pennan and Lion's Heads SPA	Black-legged Kittiwake	■	■				■	■
Troup, Pennan and Lion's Heads SPA	Northern Fulmar	■	■		■		■	
Fair Isle SPA	Black-legged Kittiwake	■	■				■	■
Fair Isle SPA	Great Skua	■					■	
Fair Isle SPA	Atlantic Puffin		■	■	■	■	■	■
Fair Isle SPA	Northern Fulmar	■	■		■		■	
Fair Isle SPA	Northern Gannet	■	■			■	■	■
Foula SPA	Black-legged Kittiwake	■	■				■	■
Foula SPA	Great Skua	■					■	
Foula SPA	Atlantic Puffin		■	■	■	■	■	■
Foula SPA	Northern Fulmar	■	■		■		■	

Site	Qualifying Feature	Pathway to LSEs[20]						
		1	2	3	4	5	6	7
Ronas Hill - North Roe and Tingon Ramsar Site	Great Skua	■					■	
Mingulay and Berneray SPA	Black-legged Kittiwake	■	■				■	■
Mingulay and Berneray SPA	Atlantic Puffin		■	■	■	■	■	■
Sumburgh Head SPA	Black-legged Kittiwake	■	■				■	■
Buchan Ness to Collieston Coast SPA	Black-legged Kittiwake	■	■				■	■
Noss SPA	Black-legged Kittiwake	■	■				■	■
Noss SPA	Great Skua	■					■	
Noss SPA	Northern Fulmar	■	■		■		■	
Noss SPA	Northern Gannet	■	■			■	■	■
Fowlsheugh SPA	Black-legged Kittiwake	■	■				■	■
North Colonsay and Western Cliffs SPA	Black-legged Kittiwake	■	■				■	■
Outer Firth of Forth and St Andrews Bay Complex SPA	Black-legged Kittiwake	■	■				■	■
Outer Firth of Forth and St Andrews Bay Complex SPA	Northern Gannet	■	■			■	■	■
Fetlar SPA	Great Skua	■					■	

Site	Qualifying Feature	Pathway to LSEs[20]						
		1	2	3	4	5	6	7
Hermaness, Saxa Vord and Valla Field SPA	Great Skua							
Hermaness, Saxa Vord and Valla Field SPA	Northern Gannet							
Forth Islands SPA	Northern Gannet							
Ailsa Craig SPA	Northern Gannet							

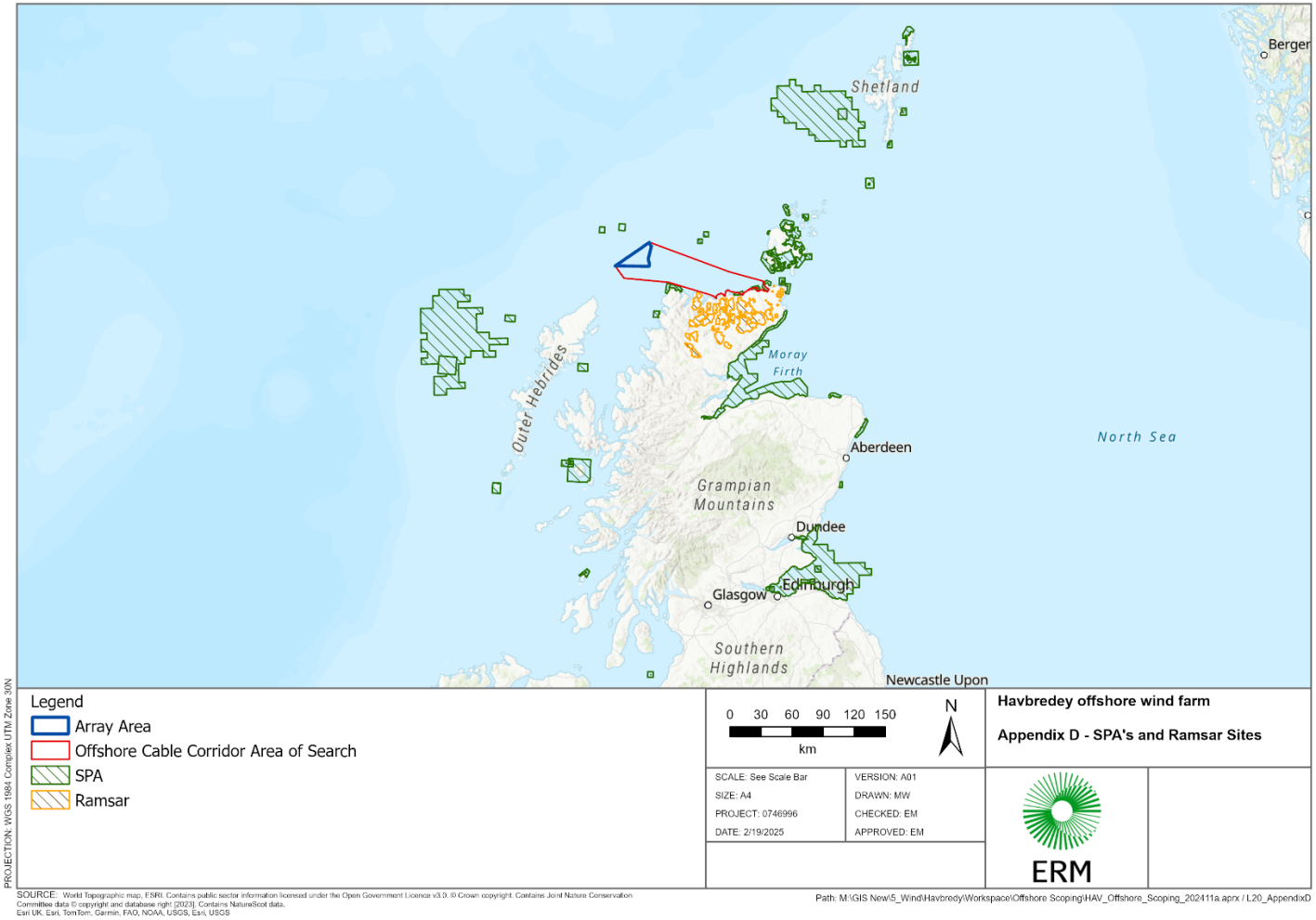

Figure 8.3-2 SPAs and Ramsar Sites and their Qualifying Features for which LSE could not be excluded during the screening exercise