

The Great Grid Upgrade

Eastern Green Link 5 (EGL 5)

Preliminary Environmental Information Report

Volume 1

Part 3

Chapter 21 Marine Mammals and Marine Reptiles

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21. Marine Mammals and Marine Reptiles

21.1 Introduction

- 21.1.1 This chapter presents the preliminary findings of the Environmental Impact Assessment (EIA) undertaken to date for the Eastern Green Link 5 (EGL 5) English Offshore Scheme, with respect to marine mammals and marine reptiles. The preliminary assessment is based on information obtained to date. It should be read in conjunction with the description of the Project provided in **Volume 1, Part 1, Chapter 4: Description of the Project**.
- 21.1.2 This chapter describes the methodology used, the datasets that have informed the preliminary assessment, baseline conditions, environmental measures, and the potential preliminary marine mammals effects that could result from the English Offshore Scheme during the construction, operation (and maintenance), and decommissioning phases. Specifically, it relates to the English Offshore elements of the Scheme seaward of Mean High Water Springs (MHWS) where the English Offshore Scheme makes landfall at Anderby Creek on the Lincolnshire coastline to the border between English and Scottish adjacent waters.
- 21.1.3 The Scoping Report baseline concluded that marine turtles are rarely present in the Southern North Sea (Ref 21. 1) and were therefore excluded as a receptor (Scoping Opinion Table 22-10). Although Natural England advised that the Environmental Statement (ES) should consider impacts on Protected Species (including marine turtles) the Scoping Opinion (Ref 21. 2) did not comment with respect to marine turtles. Marine turtles have therefore not been assessed in this Preliminary Environmental Information Report (PEIR) chapter but if present, environmental measures proposed for cetaceans and pinnipeds would adequately mitigate any impacts.
- 21.1.4 This chapter should be notably read in conjunction and considered alongside the following technical aspect chapters found in **Volume 1**:
- **Part 1, Chapter 2: Regulatory and Policy Overview;**
 - **Part 1, Chapter 5: PEIR Approach and Methodology;**
 - **Part 2, Chapter 6: Biodiversity** which considers the European otter (*Lutra lutra*), a mammal that can use the Intertidal Zone and nearshore environment for foraging.
 - **Part 3, Chapter 17: Coastal and Marine Physical Processes** which identifies the spatial extent of potential for impacts from temporary sediment suspension and subsequent redeposition.
 - **Part 3, Chapter 18: Intertidal and Subtidal Benthic Ecology** which identifies the potential impacts on supporting habitats and key prey species for marine mammals.
 - **Part 3, Chapter 19: Fish and Shellfish** which identifies the potential impacts on key prey species for marine mammals; and
 - **Part 4, Chapter 27: Cumulative Effects.**

- 21.1.5 This chapter is supported by the following figures in **Volume 3, Part 3**:
- **Figure 21-1: Marine Mammal Study Areas and Management Units;**
 - **Figure 21-2: Designated Sites within the English Offshore Scheme;**
 - **Figure 21-3: SCANS III and SCANS IV Survey Blocks;**
 - **Figure 21-4: Harbour Porpoise Density within the Southern North Sea SAC; and**
 - **Figure 21-5: Grey Seal and Harbour Seal Population Densities.**
- 21.1.6 This chapter is supported by the following appendices in **Volume 2**:
- **Volume 2, Part 1, Appendix 2.A: Regulatory and Planning Context;**
 - **Volume 2, Part 1, Appendix 2.B: Marine Plan Policy Assessment;**
 - **Volume 2, Part 1, Appendix 5.A: Outline Register of Design Measures;**
 - **Volume 2, Part 1, Appendix 5.B: Outline Code of Construction Practice;**
 - **Volume 2, Part 1, Appendix 5.C: Outline Construction Environmental Management Plan; and**
 - **Volume 2, Part 3, Appendix 21.A: Eastern Green Link 3 and 4 Underwater Noise Modelling Technical Report.**
- 21.1.7 As set out in **Volume 1, Part 1: Chapter 1: Introduction**, cable installation and some associated activities beyond 12 Nautical Miles (NM), and emergency repair of the installed cable within the draft Order Limits are exempt under the Marine and Coastal Access Act 2009 (MCAA 2009). This chapter presents a preliminary assessment of the cable route from MHWS at the Anderby Creek Landfall to the maritime boundary between England and Scotland adjacent waters. This is to ensure all likely significant effects of the English Offshore Scheme have been assessed. However, consent is not being sought for the exempt cable and only external cable protection and dredging for sandwave clearance will be included in the Deemed Marine Licence (DML) beyond 12 NM.
- 21.1.8 **Volume 1, Part 1, Chapter 4: Description of the Project** establishes that the Applicant is applying to undertake Unexploded Ordnance (UXO) identification as part of the Deemed Marine Licence. UXO Clearance would be the subject of a separate Marine Licence and EIA. A high-level preliminary assessment of the effects of UXO clearance and the potential environmental measures that would be considered as part of the separate Marine Licence application are provided in this chapter to provide a holistic overview of the effects of the English Offshore Scheme.

Limitations

- 21.1.9 The information provided in this PEIR is preliminary, the final assessment of significant effects will be reported in the ES. The PEIR has been produced to fulfil National Grid Electricity Transmission plc (the 'Applicant') consultation duties in accordance with Section 42 of the Planning Act 2008 (PA 2008) and enable consultees to develop an informed view of the preliminary significant effects of the English Offshore Scheme.
- 21.1.10 This PEIR chapter has been collated based on publicly available data. Project-specific data has been used to supplement the publicly available data where marine mammal observations have been undertaken (e.g., as mitigation for the English Offshore Scheme marine characterisation surveys). The data has not been supplemented by additional project-specific marine mammal field surveys, as agreed with the Planning Inspectorate

see ID 4.5.13 of the Scoping Opinion. It is assumed that the data collected is accurate. However, there are limitations to the original marine mammal surveys used to inform this data, namely that most marine mammals are wide-ranging and uninhibited by anthropogenic borders. Those recorded within the waters of the English Offshore Scheme are likely to be individuals from larger biological populations with ranges encompassing other points along the UK coast, international waters, or the High Seas. Therefore, each survey provides a regional synopsis of wider marine mammal populations in the North Sea and beyond. Data from the Small Cetacean Abundance in European Atlantic and the North Sea surveys (SCANS) used in this assessment have traditionally been collected during the summer months (mainly July) of a given survey year, representing summer distributions of cetacean species only. The winter SCANS surveys (Ref 21. 3) have therefore been initiated as an extension to SCANS-IV and to assess the feasibility of future winter surveys. However, as summer distributions are generally higher than winter, it is considered that the assessment is based upon a worst-case scenario of cetacean presence in the waters of the English Offshore Scheme.

- 21.1.11 The assessment has been undertaken based on the description of the English Offshore Scheme presented in **Volume 1, Part 1, Chapter 4: Description of the Project**. Specific external cable protection locations are not known at this stage and will be provided within the ES. To allow flexibility due to changing seabed conditions or features, it is assumed that the English Offshore Scheme could be installed anywhere within the draft Order Limits. It has also been assumed that remedial external cable protection could be used at any point along the English Offshore Scheme and therefore anywhere within the draft Order Limits.
- 21.1.12 In the absence of data, a precautionary approach has been taken and professional judgement, based on experience of similar linear projects, have been used where required to inform the scope of the assessment.
- 21.1.13 Various technical assessments were undertaken to inform the EGL 3 and EGL 4 EIA. Where relevant (i.e., where construction methodologies are essentially identical, or where an impact pathway would occur over a similar spatial / temporal scope) the conclusions of those assessments have been used to scope 'in' or 'out' various impact pathways. These are not necessarily proposed to be repeated to inform the PEIR for this Project.
- 21.1.14 It is assumed that the data available from existing literature, relevant surveys and the proposed assessments will provide an appropriate evidence-base for marine mammals within the waters of the English Offshore Scheme. It is recognised that there is limited data available on the behaviour and extent of some species, however, given the linear nature of the English Offshore Scheme and the temporary nature of most potential impacts, it is not anticipated this limitation will adversely affect the assessment.
- 21.1.15 As noted in the Scoping Report, this assessment has been informed by **Volume 2, Part 3, Appendix 21.A: Eastern Green Link 3 and 4 Underwater Noise Modelling Technical Report**. At the time of preparing this PEIR, the latest version of the EGL 3 and EGL 4 underwater noise modelling technical report was not available. The Applicant is aware that the EGL 3 and EGL 4 Project teams are consulting with stakeholders to address comments received during Statutory Consultation. The preliminary assessment findings presented in this chapter are therefore based on the original version of the **Volume 2, Part 3 Appendix 21.A: Eastern Green Link 3 and 4 Underwater Noise Modelling Technical Report**. The Applicant acknowledges the comments provided by the Planning Inspectorate and JNCC (Joint Nature Conservation Committee) as part of the Scoping Opinion and will engage with JNCC to discuss this matter further and will provide an updated version of this report ahead of the DCO application submission.

Preliminary significance conclusions

21.1.16 The preliminary environmental assessment presented in this chapter has concluded that all of the potential significant effects assessed are **Not Significant** in EIA terms. The Negligible or Minor adverse effects can be adequately controlled by best practice and legal controls. Further details of the methodology behind the assessment, and a detailed narrative of the assessment itself are provided within the sections below. The assessments are presented in full in Sections 21.10 to Section 21.17.

21.2 Relevant Technical Guidance

Technical guidance

21.2.1 The legislation and planning policy which has informed the assessment of effects with respect to marine mammals is provided within **Volume 1, Part 1, Chapter 2: Regulatory and Policy Overview** and **Volume 2, Part 1, Appendix 2.A: Regulatory and Planning Context**. Further information on policies relevant to the English Offshore Scheme is provided in **Volume 2, Part 1, Appendix 2.B: Marine Plan Policy Assessment**. Relevant technical guidance, specific to marine mammals, that has informed this PEIR and will inform the assessment within the ES is summarised below.

21.2.2 Marine mammals are protected by several national and international conventions including:

- The Habitats Regulations - a collective term for The Conservation of Habitats and Species Regulations 2017 (as amended) (COHSR) and The Conservation of Offshore Marine Habitats and Species Regulations 2017 (as amended) (COMHSR);
- Natural Environment and Rural Communities 2006 (NERC) Act;
- Wildlife and Countryside Act 1981 (as amended in 1985);
- Conservation of Seals Act 1970;
- Conservation of Seals (England) Order 1999;
- Convention on International Trade in Endangered Species of Wild Fauna and Flora - CITES. Aims to protect endangered plant and animal species from illegal trade and over-exploitation; and
- Convention for the Protection of the Marine Environment of the North-East Atlantic - OSPAR Convention. The OSPAR Convention aims to protect the marine environment of the North-East Atlantic.

21.2.3 These legislative measures protect marine mammals by establishing restrictions on activities that may cause negative impacts (e.g., death, injury, or disturbance). Most notably, all cetaceans and otter are listed as European Protected Species (EPS) under the Habitats Regulations. The responsibility is therefore on the developer/applicant to provide evidence that the obligations under these regulations have been considered in an impact assessment and do not result in significant adverse effects.

21.2.4 A summary of the technical guidance for marine mammals is given in **Table 21-1**.

Table 21-1 Technical guidance for the marine mammals assessment

Technical guidance document	Context
Guidance for assessing the significance of noise disturbance against Conservation Objectives of harbour porpoise Special Area of Conservation (SAC)s (Ref 21. 4).	This document provides an update of the 2020 guidance which sets out the industry standard approach to assess the potential effects of a project on harbour porpoise. Establishes Effective Deterrence Ranges (EDR) for geophysical survey and other impulsive sound sources used in offshore construction.
Guidance for assessing the significance of noise disturbance against Conservation Objectives of harbour porpoise SACs (Ref 21. 5).	
JNCC guidelines for minimising the risk of injury to marine mammals from UXO clearance in the marine environment (Ref 21. 6).	Sets out the industry approach to mitigation for UXO clearance, updated from the 2017 guidance.
UK Government Guidance Supporting minimising environmental impacts from unexploded ordnance clearance (Ref 21. 7).	
Draft JNCC guidelines for minimising the risk of injury to marine mammals from geophysical surveys (Ref 21. 8).	Activities will be compliant with both the original guidance and the new draft guidance issued in 2025 (and any subsequent amendments to the 2025 draft guidance), which set out the industry standard approach to mitigation for geophysical surveys.
JNCC guidelines for minimising the risk of injury to marine mammals from geophysical surveys (Ref 21. 9).	
Update to: Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Version 3.0) (Ref 21. 10).	These publications set out the peer reviewed thresholds for assessing the significance of underwater noise changes on marine mammals in terms of injury and disturbance effects.
Marine Mammal Noise Exposure Criteria: Assessing the Severity of Marine Mammal Behavioural Responses to Human Noise (Ref 21. 11).	
Marine Mammal Noise Exposure Criteria: Updated Scientific Recommendations for Residual Hearing Effects (Ref 21. 12).	
Revisions to: Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Version 2.0): Underwater Thresholds for Onset of Permanent and Temporary Threshold Shifts (Ref 21. 13).	

21.3 Consultation and Engagement

Overview

21.3.1 The assessment has been informed by consultation responses and ongoing stakeholder engagement. An overview of the approach to consultation is provided in Section 5.9 of **Volume 1, Part 1, Chapter 5: PEIR Approach and Methodology**. This ongoing stakeholder engagement will continue through to the ES and key consultees will be consulted fully as the ES is prepared. An overview of the technical engagement undertaken or planned to inform the marine mammals assessment is provided in paragraph 21.3.3.

Scoping Opinion

21.3.2 A Scoping Opinion (**Ref EN0210010**) was adopted by the Secretary of State, administered by the Planning Inspectorate, on 13 October 2025. A summary of the relevant responses received in the Scoping Opinion in relation to the marine mammals, and confirmation of how these have been addressed within the assessment to date, is presented in **Table 21-2**. The information in the PEIR is preliminary and not all Scoping Opinion comments have been addressed at this stage, however all comments will be addressed within the ES.

Table 21-2 Summary of EIA Scoping Opinion responses for the marine mammals assessment

Consultee	Category	Consideration	How addressed in this PEIR
Planning Inspectorate ID 4.5.1	Changes in supporting habitat and prey availability for otter and marine turtles during construction, operation and decommissioning.	The Planning Inspectorate agrees that this matter can be scoped out of further assessment, noting that impacts to otter from the English Onshore Scheme would be separately assessed in the biodiversity ES chapter.	Acknowledged. Impact pathway continues to remain scoped out of this Chapter as agreed.
Planning Inspectorate ID 4.5.2	Underwater noise changes from geophysical survey affecting otter and marine turtles during construction, operation and decommissioning.	The Planning Inspectorate agrees that this matter can be scoped out of further assessment, noting that impacts to otter from the English Onshore Scheme would be separately assessed in the biodiversity ES chapter.	Acknowledged. Impact pathway continues to remain scoped out of this Chapter as agreed.
Planning Inspectorate ID 4.5.3	Underwater noise changes from presence of project vessels and equipment affecting cetaceans and pinnipeds during construction, operation and decommissioning.	The Planning Inspectorate agrees that underwater noise change leading to auditory injury to cetaceans and pinnipeds can be scoped out based on the information presented.	Underwater noise change leading to auditory injury remains scoped out of this Chapter as agreed.
		The ES should include a summary of the modelling completed for EGL 3 and EGL 4. Noting that the Scoping Report acknowledges potential for disturbance effects and the advice of JNCC (provided in Appendix 2 of the Scoping Opinion), the Planning Inspectorate does not have sufficient justification to agree that noise disturbance of cetaceans and pinnipeds can be scoped out.	A summary of the Underwater Noise Modelling undertaken for EGL 3 and EGL 4 upon which the EIA relies on is provided in Section 21.12.

Consultee	Category	Consideration	How addressed in this PEIR
		<p>In addition, the Planning Inspectorate considers that there is potential for likely significant cumulative effects from visual disturbance because of the presence of vessels and equipment. The applicant's attention is drawn to JNCC's comment (provided in Appendix 2 of the Scoping Opinion) in this regard. An assessment of disturbance effects should be provided, or the ES should demonstrate the absence of likely significant effects with evidence of agreement from relevant consultation bodies. The Planning Inspectorate comments on assessment method are set out at ID 4.5.15 of this Opinion.</p>	<p>The potential for noise disturbance to cause Likely Significant Effects (LSE) on cetaceans and pinnipeds has been assessed in the Preliminary Impact Assessment - see Section 21.12.</p> <p>The potential for likely significant cumulative effects from visual disturbance because of the presence of vessels and equipment has been considered by the EIA and assessed in the Preliminary Impact Assessment - see Section 21.15.</p>
Planning Inspectorate ID 4.5.4	Underwater noise changes from presence of project vessels and equipment affecting otter and marine turtles during construction, operation and decommissioning.	The Planning Inspectorate agrees that this matter can be scoped out of further assessment, noting that impacts to otter from the English Onshore Scheme would be separately assessed in the biodiversity ES chapter.	Acknowledged. Impact pathway continues to remain scoped out of this Chapter as agreed.
Planning Inspectorate ID 4.5.5	Collision with project vessels affecting cetaceans and pinnipeds during construction, operation and decommissioning.	The Planning Inspectorate does not have sufficient justification to agree that this matter can be scoped out, and notes JNCC comments (provided in Appendix 2 of the Scoping Opinion) regarding the need to assess increased risk from collision, including from impacts other than fatality. The ES should clearly describe the likely number of vessels to be used and provide an assessment of collision impacts or demonstrate the absence of likely significant	Collision with project vessels has been assessed in the Preliminary Impact Assessment - see Section 21.14.

Consultee	Category	Consideration	How addressed in this PEIR
		effects with evidence of agreement from relevant consultation bodies.	
Planning Inspectorate ID 4.5.6	Collision with project vessels affecting otter and marine turtles during construction, operation and decommissioning.	The Planning Inspectorate agrees that this matter can be scoped out of further assessment, noting that impacts to otter from the English Onshore Scheme would be separately assessed in the biodiversity ES chapter.	Acknowledged. Impact pathway continues to remain scoped out as agreed.
Planning Inspectorate ID 4.5.7	Electromagnetic changes or barrier to species movement from presence of cables affecting cetaceans, pinnipeds, marine turtles, otter and relevant designated sites during construction, operation and decommissioning.	Based on the information provided, the Planning Inspectorate agrees that this matter can be scoped out of further assessment.	Acknowledged. Impact pathway continues to remain scoped out of this Chapter as agreed.
Planning Inspectorate ID 4.5.8	Temperature increase from the presence of cables affecting cetaceans, pinnipeds, marine turtles, otter and relevant designated sites during construction, operation and decommissioning.	The Planning Inspectorate agrees that this matter can be scoped out of further assessment based on the information presented.	Acknowledged. Impact pathway continues to remain scoped out of this Chapter as agreed.
Planning Inspectorate ID 4.5.9	Accidental spills from the presence of project vessels and equipment affecting cetaceans, pinnipeds, marine turtles, otter and relevant designated sites during construction, operation and decommissioning.	The Planning Inspectorate is content to scope this matter out noting the legal requirements upon vessels to manage any accidental spills, and that relevant measures to comply with legislation will be outlined in management plans to be submitted with the DCO application.	Acknowledged. Impact pathway continues to remain scoped out as agreed. Several management plans will be provided with the ES to support the Deemed Marine Licence. These will include an Outline Construction Environmental Management Plan (Volume 2, Appendix 5.D: Outline Construction Environmental Management Plan (CEMP)) and Outline Marine Pollution Contingency

Consultee	Category	Consideration	How addressed in this PEIR
Planning Inspectorate ID 4.5.10	Visual disturbance from the presence of project vessels and equipment affecting cetaceans, pinnipeds, marine turtles and otter during construction, operation and decommissioning.	The Planning Inspectorate agrees that effects to cetaceans and marine turtles can be scoped out of further assessment. However, there is insufficient justification regarding pinnipeds and otter. Whilst the Planning Inspectorate notes the justification for project vessels, it is unclear if there are other activities at landfall or in the intertidal area that could result in visual disturbance to seal haul-out sites or otter using intertidal areas. The ES should clarify this and provide an assessment or otherwise demonstrate an absence of likely significant effects with evidence of agreement from relevant consultation bodies.	<p>Plan. These documents will outline measures to be implemented to comply with legislation (e.g., in relation to the prevention of oil and chemical spills) during all phases of the English Offshore Scheme.</p> <p>Acknowledged. Cetaceans and marine turtles continue to remain scoped out as agreed for this impact pathway.</p> <p>The potential for LSE of visual disturbance on pinnipeds and otter at the Anderby Creek Landfall or in the Intertidal Zone has been considered in the Preliminary Impact Assessment - see Section 21.15.</p>
Planning Inspectorate ID 4.5.11	Transboundary impacts to cetaceans, pinnipeds, and relevant designated sites during construction, operation and decommissioning.	The Planning Inspectorate cannot agree to scope this matter out until it has undertaken its own transboundary screening.	Acknowledged. To support the Inspectorate's assessment, transboundary impacts have been considered by the EIA and assessed in the Preliminary Impact Assessment. See Section 21.16.
Planning Inspectorate ID 4.5.12	Underwater noise changes from UXO clearance affecting marine turtles and otter during construction, operation and decommissioning.	The Planning Inspectorate agrees that this matter can be scoped out of further assessment, noting that impacts to otter from the English Onshore Scheme would be	Acknowledged. Impact pathway continues to remain scoped out of this Chapter as agreed.

Consultee	Category	Consideration	How addressed in this PEIR
		separately assessed in the biodiversity ES chapter.	
Planning Inspectorate ID 4.5.13	Project-specific marine mammal and turtle studies and surveys.	The Scoping Report states that no specific additional studies are proposed given the extensive information available from public data sources. Paragraphs 22.7.3 to 22.7.4 describe proposed survey work, which would comprise recorded sightings during geophysical survey for the proposed development and EGL 3. The Planning Inspectorate is content with this approach.	Acknowledged. No marine mammals were sighted during the geophysical surveys for the English Offshore Scheme. Observations from the EGL 3 geophysical survey are included in the baseline description presented in Paragraph 21.5.16.
Planning Inspectorate ID 4.5.14	Underwater noise modelling.	It is proposed to use underwater noise modelling completed for EGL 3 to inform the assessment, with the Scoping Report stating that the proposed development has the same cable specification, configuration and rating, water depth and length as EGL 3 and the cable routes run in parallel. The Planning Inspectorate is content with this approach but advises that the ES should include the justification as to why the EGL 3 modelling is relevant to the proposed development. The ES should include evidence that the EGL 3 modelling has been discussed and agreed with relevant consultation bodies. The applicant's attention is drawn to JNCC's comments (provided in Appendix 2 of the Scoping Opinion) in this regard.	Acknowledged. Section 21.12 has been updated to include justification for use of the EGL 3 & EGL 4 underwater noise modelling. The ES will also include this evidence.
Planning Inspectorate ID 4.5.15	Assessment of Permanent Threshold Shift (PTS) and Temporary Threshold Shift (TTS).	The Scoping Report does not refer to assessment of PTS or TTS other than noting in Table 20-2 that this is a policy	Acknowledged. Section 21.13 includes the TTS impact ranges and

Consultee	Category	Consideration	How addressed in this PEIR
		<p>requirement in National Policy Statement (NPS) EN-3. The ES should present the TTS impact ranges and the number of animals predicted to be at risk from impact pathways scoped in for assessment of underwater noise change. The applicant should seek to agree the approach to the assessment of PTS and TTS-onset on marine mammals with the relevant consultation bodies.</p>	<p>number of animals predicted to be at risk.</p>
<p>Planning Inspectorate ID 4.5.16</p>	<p>Guidance for underwater noise.</p>	<p>The applicant's attention is drawn to the comments of JNCC and Natural England (provided in Appendix 2 of the Scoping Opinion) regarding updated guidance documents for assessment of underwater noise, including UXO clearance. The ES should be informed by the latest guidance.</p>	<p>The Preliminary Assessment provided in Section 21.13 has taken into consideration the updated guidance documents as listed in Section 21.2.</p>
<p>Planning Inspectorate ID 4.5.17</p>	<p>Harbour seal of Teesmouth and Cleveland Coast Site of Special Scientific Interest (SSSI).</p>	<p>Noting the advice of Natural England (provided in Appendix 2 of the Scoping Opinion), the Planning Inspectorate advises that this receptor can be scoped out of further assessment based on the proposed development being located more than 50 km from the designated site, which is beyond the receptor's foraging distance.</p>	<p>Acknowledged. Impact pathway continues to remain scoped out of this Chapter as agreed.</p>
<p>Planning Inspectorate</p>	<p>Mitigation for Southern North Sea SAC.</p>	<p>The ES should set out how significant cumulative effects to qualifying features of the Southern North Sea SAC would be mitigated, based on a thorough assessment of the impact pathways including simultaneous noisy construction activities. The Planning Inspectorate advises that an</p>	<p>Mitigation measures would be developed through the HRA process in consultation with the JNCC and Natural England and presented in the Report to Inform Appropriate Assessment (RIAA) to be provided with the DCO application.</p>

Consultee	Category	Consideration	How addressed in this PEIR
JNCC	Relevant Legislation, Planning Policy and Technical Guidance	<p>outline site integrity plan should be submitted as part of the ES. Effort should be made to agree the approach with relevant consultation bodies.</p> <p>Comment has been paraphrased. JNCC have provided links to guidance that they would expect to see implemented including:</p> <ul style="list-style-type: none"> • The recently updated (2025) JNCC guidelines for minimising the risk of injury to marine mammals from unexploded ordnance (UXO) clearance in the marine environment. • Defra’s policy paper on reducing underwater noise in relation to marine mammals. • Guidance on noise management in harbour porpoise SACs (2020, JNCC Report 654) • Updated Effective Deterrent Ranges (EDRs) (2025, JNCC Report 803) 	Acknowledged. Updated guidance has been referred to throughout this PEIR chapter.
JNCC	Baseline Conditions	<p>JNCC agree with the use of the published Marine Mammal Management Units (MUs) to determine the zone of influence (Zol) for cetaceans to scope in study area and assess potential impacts on cetacean populations.</p>	Acknowledged. MUs have been used to determine the Study Area for cetaceans, as presented in Section 21.4.

Consultee	Category	Consideration	How addressed in this PEIR
JNCC	Data Gathering Methodology	JNCC are content with the approach stated at this stage and have no comments to make in relation to the data gathering and methodology.	Acknowledged.
JNCC	Current Baseline	JNCC agree that all species discussed are as expected for the scope of the project.	Acknowledged.
JNCC	Table 22-9: Protected Species	Please note that white-beaked dolphins have been incorrectly labelled as Annex II species in Table 22.9. We assume this is likely an error as bottlenose dolphins have not been listed as Annex II, which appears to be an oversight.	Acknowledged. Information provided in the table has been checked and amended and appropriate.
JNCC	Designated Sites	Comment has been paraphrased. JNCC noted that the English Offshore Scheme crosses the summer and winter grounds of the Southern North Sea SAC and welcomed that the distinction had been made but requested that the distances provided (route lengths) are checked as they appear to be inconsistent.	Distances in Section 21.5 have been checked and updated throughout.
JNCC	Design and Control Measures	JNCC agree with the approach to apply for a separate marine licence for UXO clearance if required, as stated in Section 22.5.4 and welcome the inclusion of the underwater noise assessment for this activity when the required licence is applied for.	Acknowledged. A separate Marine Licence for UXO clearance will be applied for, if required.
JNCC	Scope of the Assessment	JNCC agree with all the marine mammal receptors that will be scoped into the assessment as outlined in Section 22.6.1.and defer to the relevant inshore	Acknowledged.

Consultee	Category	Consideration	How addressed in this PEIR
JNCC	Table 22.10: Scoping assessment of impacts on marine mammals and marine reptiles	<p>agency for matters relating to pinnipeds and marine reptiles.</p> <p>We agree with the impact pathways scoped in and out of the assessment as outlined in Table 22-10 with the exception of;</p> <p>1) Underwater noise changes: Physical presence of Presence of project vessels and equipment. We do not agree with the decision to scope out this impact and recommend that this is assessed within the EIA. The justification provided against this impact within Table 22-10 lacks sufficient evidence to justify this scoping assessment decision. We advise that the physical presence of vessels and equipment will likely disturb sensitive marine mammal receptors animals from the project area with the additional risk of creating a barrier to species movement.</p> <p>2) Collision with project vessels: JNCC advise that this impact is scoped in to the assessment as the Applicant needs to consider the increase in risk from collision with project vessels if there is a significant number of vessels within the project. JNCC advise further justification be provided on how the project will seek to mitigate the risk of collision (e.g. vessel management plans, codes of practice etc). This should be considered throughout the project lifetime including operation and maintenance and not just at the construction phase. We would like to highlight that the risk of fatality is not</p>	<p>Acknowledged. Underwater noise resulting from the presence of project vessels and equipment has been assessed in Section 21.12.</p> <p>Collision with project vessels has been assessed in Section 21.14.</p> <p>Electromagnetic changes / Barrier to species movements has been scoped out in this PEIR chapter, see Table 21-10. If there is new or emerging evidence in relation to electromagnetic changes prior to the submission of the ES, this may be subject to change.</p> <p>Visual disturbance has been assessed in Section 21.15.</p>

Consultee	Category	Consideration	How addressed in this PEIR
		<p>the only risk to marine mammals if collision occurs with project vessels.</p> <p>3) Electromagnetic changes / Barrier to Species movement: JNCC question whether barrier to species movement and electromagnetic changes should be grouped together. We advise that these are assessed individually as while the presence of cables may not be a barrier to species movement during the operational phase of the project, presence of the project vehicles and equipment could pose a barrier risk during the construction, operational and decommissioning phases. While we agree in principle</p> <p>at this stage with the decision to scope out electromagnetic changes, we advise that this may be subject to change if any new or emerging evidence is published in relation to electromagnetic changes prior to the submission of the PEIR or ES.</p> <p>4) Visual disturbance: We agree with the decision to scope out the effect of visual disturbance on marine mammal receptors Table 22-10 for the project alone assessment provided the physical presence of vessels is scoped in (as outlined in point 1) above). The physical presence of the project vessels and equipment during all phases of the English Offshore Scheme has the potential to disturb marine mammals especially when considered cumulatively with other projects such as EGL3 and EGL4. We would argue that this is a reason for this</p>	

Consultee	Category	Consideration	How addressed in this PEIR
		<p>impact to be assessed as it will need to consider the impact of a further increase in vessel traffic resulting from the project(s). Stating that the region is already used by large ships and ferries and animals are therefore habituated to the presence of vessels is not a robust enough justification.</p>	
JNCC	Assessment Methodology	<p>Comment has been paraphrased. JNCC noted that Applicants intention to rely on underwater noise modelling prepared for the EGL 3 and EGL 4 Projects. Whilst JNCC do not disagree with this approach in principle, it is highlighted that the underwater noise modelling for EGL3 and EGL4 is still under discussion and is waiting to be agreed. If following discussions on the EGL 3 and EGL 4 Projects JNCC are not satisfied with the assessment it may be necessary for the assessment to be repeated.</p> <p>JNCC welcome the use of the recorded sightings from the geophysical surveys completed for the Project between April and June 2025 being used to support the baseline description of the PEIR and ES.</p> <p>JNCC are content with the details provided in relation to the assessment of cumulative impacts and effects at this stage. We have no further comments to make.</p>	<p>The reasoning for why EGL 3 and EGL 4 have used non impulsive thresholds in the underwater noise modelling assessment has been provided in Paragraphs 21.11.5 and 21.11.7.</p> <p>The baseline considered marine mammal observations from the geophysical surveys completed for the English Offshore Scheme, as seen in Section 21.5, however, no observations were recorded.</p>
Natural England	<p>Paragraph 22.4.29 states that the harbour seal foraging area is within 40 – 50 km of their haul out site which has set the Study area for these species.</p>	<p>Natural England therefore does not expect the Teesmouth and Cleveland Coast SSSI to be scoped in for harbour seal.</p>	<p>Acknowledged. Impact pathway continues to remain scoped out as agreed.</p>

Consultee	Category	Consideration	How addressed in this PEIR
		Figure 22-2 includes a buffer 50km from the coastline and shows that the Teesmouth and Cleveland Coast SSSI is located beyond 50km of the scoping boundary.	
Natural England	Paragraph 22.4.51 We note that Grey Seal as a feature of Berwickshire and Northumberland Coast SAC has been scoped in	Natural England recommends the assessment uses the following information when assessing: D2019 00004409 Grey Seals condition monitoring 2016 Final Version.PDF	Acknowledged. The following information has been included in Section 21.5
Natural England	Section 22.5 Natural England agrees that the listed embedded mitigation protocols are relevant to the marine mammal assessment. However, we advise that more measures may be required to manage disturbance in the SNS SAC in the event that cabling activities take place simultaneously with other OWF construction or noisy activities in the SAC and this should be thoroughly assessed in the cumulative impact assessment. These plans and contingencies will need to be outlined in detail as part of the ES. Furthermore, a Site Integrity Plan (SIP) will need to be produced which will specify exactly how these plans will be implemented as part of marine licence. We reserve the right to comment on the suitability of these documents in mitigating impacts when they are submitted as part of the consultation process.	The ES will need to demonstrate that the necessary plans and safeguards are built into the programme to account for project alone and multiple in-combination events. Natural England advises the application also includes an outline Site Integrity Plan (SIP) to be submitted with the application.	Acknowledged. Mitigation measures will be developed through the HRA process in consultation with the JNCC and Natural England and presented in the RIAA and Outline SIP which will accompany the DCO application.

Consultee	Category	Consideration	How addressed in this PEIR
Natural England	Section 22.5 Natural England notes that it is proposed that a Marine Mammal Mitigation Plan (MMMP) will be developed should UXO clearance be required, with the use of low noise methods being used for any UXO clearance by default. Furthermore, any UXO clearance shall be assessed within a separate Marine Licence.	<p>Natural England advises a MMMP would be required for any investigative geophysical/seismic surveys undertaken along the cable route. Such surveys would be required to identify any UXOs requiring clearance, and whether any high-order contingency clearance would be required. Delaying the submission of such required documents risks delaying future pre-application discussions, or data collection, and runs counter to the increased emphasis on “front-loading” issues in the NSIP process.</p> <p>It is recommended any pre- or post-clearance data be uploaded to the Marine Noise Registry: https://mnr.jncc.gov.uk/</p> <p>Defra have recently published their Marine Noise package, which as well as their Marine Noise Policy paper, includes several updated guidance documents in relation to the clearance of UXO, for clarity these are;</p> <ul style="list-style-type: none"> • An updated Unexploded Ordnance (UXO) Joint Position Statement, which can be found here -Marine environment: unexploded ordnance clearance Joint Position Statement- GOV.UK • UXO clearance supporting guidance providing more detail for Supporting minimising environmental impacts from unexploded ordnance clearance - GOV.UK 	<p>Acknowledged. An MMMP will be developed as an outline management plan for geophysical surveys and will be submitted with the DCO application.</p> <p>UXO clearance will be consented via a separate Marine Licence accompanied by the relevant assessments. These assessments will take into consideration the guidance mentioned.</p>

Consultee	Category	Consideration	How addressed in this PEIR
		JNCC have also published new mitigation guidelines for UXO clearance, which can be found here - JNCC guidelines for minimising the risk of injury to marine mammals from unexploded ordnance (UXO) clearance in the marine environment JNCC Resource Hub	

Technical engagement

- 21.3.3 Technical engagement with consultees in relation to marine mammals is ongoing. Monthly meetings are scheduled with the Marine Management Organisation (MMO) and Joint Nature Conservation Committee (JNCC) between PEIR and ES. Discussions will cover a wide range of ecological topics but those of relevance to marine mammals will include underwater noise effects. Discussions on the same topic will also be held with Cefas and Natural England.

21.4 Data Gathering Methodology

- 21.4.1 This PEIR is based on a range of publicly available data and information. It is assumed that the data collated is accurate. The data has been supplemented with additional information acquired as part of the stakeholder engagement process. The sources of data used are noted in **Table 21-4**.

Study Area

- 21.4.2 The English Offshore Scheme proposes to route from Anderby Creek across the Southern and Central North Sea to the boundary between the English and Scottish adjacent waters. The draft Order Limits and the Marine Mammal Study areas for the English Offshore Scheme is illustrated in **Volume 3, Part 3, Figure 21-1: Marine Mammal Study Areas and Management Units**.
- 21.4.3 Given the highly mobile and transient nature of behaviour of marine mammals the Study Areas for these species has been delineated according to their mobility and geographic range, as detailed in **Table 21-3**.
- 21.4.4 Separate study areas for each cetacean species have been defined using MUs. These are delineated by the Inter-Agency Marine Mammal Working Group (IAMMWG) which is comprised of representatives from UK Statutory Nature Conservation Bodies (SNCBs) including Natural England, NatureScot, Natural Resources Wales (NRW), JNCC, and the Department of Agriculture, Environment and Rural Affairs (Defra). The boundaries of an MU do not necessarily reflect the full range of a species but instead shows areas within their territory within which management of human activities is undertaken. These units were defined by considering several factors including the known population structure, movement and habitat use, as well as jurisdictional boundaries and divisions already used in the management of human activities. MUs are used to inform SNCB advice and are therefore the appropriate spatial scale for assessment of environmental impacts on species from marine development project. MUs are reviewed at least every five years and are defined for the seven most commonly occurring cetacean species in UK waters: harbour porpoise (*Phocoena phocoena*), white-beaked dolphin (*Lagenorhynchus albirostris*), bottlenose dolphin (*Tursiops truncatus*), common dolphin (*Delphinus delphis*), minke whale (*Balaenoptera acutorostrata*), Atlantic white-sided dolphin (*L. acutus*) and Risso's dolphin (*Grampus griseus*). The latest review of MUs was published in March 2023 (Ref 21. 14).

Table 21-3 Study Area for marine mammals

Receptor	Extent of Study Area	Justification
Cetaceans (porpoises, dolphins and whales).	MUs	<p>The relevant MUs for the seven commonly occurring species have been used to define the study area, noting that the study area will change per species. Volume 3, Part 3, Figure 21-1: Marine Mammal Study Area and Management Units illustrates the spatial scale of the MUs through which the English Offshore Scheme passes. The EIA determined that the maximum Zone of Influence (Zol) for effects on marine mammals relates to underwater noise changes. Volume 2, Part 3, Appendix 21.A: Eastern Green Link 3 and 4 Underwater Noise Modelling Technical Report concludes that disturbance effects could be experienced up to 3.4 km from the draft Order Limits (a maximum precautionary distance arising from vessel noise). A precautionary Effective Deterrence Range (EDR) of 3 km (based on harbour porpoise, representing the most sensitive functional hearing group) has been used as a worst-case proxy for other species for the range at which behavioural disturbance from geophysical surveys may be observed (Ref 21. 4). The spatial scale of the MUs is therefore sufficient to encompass this Zol.</p> <p>A buffer of 250 km from the draft Order Limits has been used to identify relevant transboundary European sites. In UK waters harbour porpoise are observed to have seasonal grounds which stretch longitudinally for approximately 250 km. Therefore, a study area of 250 km is considered to be an appropriate distance to screen designated sites for mobile marine mammal species. Given that the spatial scale of impacts will be restricted to 3.4 km from the draft Order Limits this is a precautionary and conservative search area.</p>
Grey seal (<i>Halichoerus grypus</i>).	100 km from coastline.	It is estimated that grey seal forage up to 100 km from haul-out sites on the east coast of the UK (Ref 21. 15), with the area along the western and southern edges of the Dogger Bank of particular importance for grey seal foraging distribution in eastern England.
Harbour seal (<i>Phoca vitulina</i>).	50 km from coastline.	Harbour seal are not known to forage further than 50 km from haul-out sites (Ref 21. 15, Ref 21. 16) and tend to remain concentrated around the coastline (Ref 21. 17).

Receptor	Extent of Study Area	Justification
European otter (<i>Lutra lutra</i>).	Up to 80 m from MHWS and seaward. Up to 32 km along the coast from the Anderby Creek Landfall.	In freshwater habitats, otters are largely (but not exclusively) nocturnal and occupy very large home ranges (around 32 km for males and 20 km for females). Coastal otters generally have much smaller home ranges than their riverine counterparts, these can be as little as four to five km of coastline, because of the abundance of fish and crustacean prey in inshore waters (Ref 21. 18). It has been suggested that the otter's range is approximately 80 m seaward from the coast (Ref 21. 18).

Desk study

21.4.5 A summary of the data used to develop the baseline, together with the nature of that data is outlined in **Table 21-4**.

Table 21-4 Data sources used to inform the marine mammals assessment

Organisation	Data source	Data provided
Natural England (Ref 21. 19)	Natural England Open Data Geoportal.	Natural England Conservation Advice for Marine Protected Areas in England.
Joint Conservation Committee (Ref 21. 20)	Nature JNCC Southern North Sea MPA.	JNCC Conservation Advice for Marine Protected Areas.
Marine Management Organisation (MMO) – Marine Activity Data (Ref 21. 21)	Explore Marine Plans activity data.	An interactive tool that enables access to spatial information relating to the marine environment in England.
Magic Maps (Ref 21. 22)	Magic Maps.	An interactive mapping system developed by Defra that holds spatially referenced data on the natural environment for England.
BEIS (2022) (Ref 21. 23)	UK Offshore Energy Strategic Environmental Assessment - Future Leasing / Licensing for Offshore Renewable Energy, Offshore Oil & Gas and Gas Storage and Associated Infrastructure. OESEA4 Environmental Report.	Summarises the environmental baseline for UK seas, including for marine mammals. Summarises UK Regional Seas. The Southern North Sea SAC falls within Regional Sea 2 (Southern North Sea).
Reid <i>et al.</i> (2016) (Ref 21. 24)	JNCC Atlas of Cetacean Distribution.	Atlas of cetacean distribution in northwest European waters.

Organisation	Data source	Data provided
Hammond <i>et al.</i> (2021) (Ref 21. 25)	SCANS III	Estimates of cetacean abundance in European Atlantic waters in summer 2016 from SCANS-III.
Gilles <i>et al.</i> (2023, 2025) (Ref 21. 26, Ref 21. 27)	SCANS IV Report SCANS IV spatial models of cetacean density report based on SCANS-IV summer 2022 survey data.	Estimates of cetacean abundance in European Atlantic waters in summer 2022 from the SCANS-IV aerial and shipboard surveys. Including updated 2025 spatial models of cetacean density based on SCANS-IV summer 2022 survey data.
Ramirez-Martinez <i>et al.</i> (2024) (Ref 21. 3)	winterSCANS	Estimates of cetacean abundance in the Southern North Sea in winter 2024.
Joint Cetacean Data Programme (JCDP) (2022) (Ref 21. 28)	ICES dashboard.	Portal collating at-sea effort-related data collected via ship-based or aerial methods, under the JCDP.
Heinanen and Skov (2015) (Ref 21. 29)	JNCC Harbour Porpoise.	The identification of discrete and persistent areas of relatively high harbour porpoise density in the wider UK marine area.
Russell <i>et al.</i> (2017) (Ref 21. 30)	Updated Seal Usage Maps.	The estimated at-sea distribution of grey and harbour seal.
Sea Watch Foundation (Ref 21. 31)	Sightings data.	Sea Watch Foundation sightings data.
The Marine Life Information Network (Ref 21. 32)	Information on the biology of species and the ecology of habitats found around the coasts and seas of the British Isles.	Species Information.
National Biodiversity Network Gateway (Ref 21. 33)	Species occurrence records.	Occurrence records for marine turtles, cetaceans, pinnipeds and European otter.
Waggitt <i>et al.</i> (2019) (Ref 21. 34)	Distribution maps of cetaceans and seabirds.	Distribution maps of cetacean and seabird populations in the northeast Atlantic.
Hague <i>et al.</i> (2020) (Ref 21. 35)	Abundance and distribution of cetaceans.	Provides a review of abundance estimates and distribution of marine mammals across the North Sea and Atlantic areas of Scottish waters.
Special Committee on Seal (Ref 21. 36)	Seal populations.	UK seal monitoring programme – annual report 2024 (or subsequent update if released).

Organisation	Data source	Data provided
Carter <i>et al.</i> (2022) (Ref 21. 37)	NMPi data layer of Common / harbour seal (<i>Phoca vitulina</i>) - mean percentage at-sea population per 25 km.	Data updated from Carter <i>et al.</i> (2020). Mean percentage of at-sea Common / harbour seal population.
Crawford (2010) (Ref 21. 38)	National otter survey.	Fifth otter survey of England 2009 – 2010.
IAMMWG (2023) (Ref 21. 39)	Review of marine mammal Management Units.	Updated abundance estimates for cetacean Management Units in UK waters. JNCC Report No. 734.
National Electricity Transmission (Ref 21. 40)	Grid EGL 3 & EGL 4 PEIR.	Eastern Green Link 3 (EGL 3) and Eastern Green Link 4 (EGL 4) Projects marine mammal observations from geophysical surveys between August 2023 and February 2024.
Offshore Wind Farm Aerial Surveys.	Hornsea 2: (Ref 21. 41) Ossian: (Ref 21. 42) Outer Dowsing: (Ref 21. 43) Outer Dowsing ES: (Ref 21. 44) Hornsea Three (Ref 21. 45): Dogger Bank A (Ref 21. 46): Dogger Bank South (Ref 21. 47).	Offshore Wind Farms (OWF) collect two years of aerial survey data to establish the baseline for marine mammals within the array sites. The following OWFs lie within the study area and data will be sought from each Projects consent applications, respectively, to inform the baseline: <ul style="list-style-type: none"> • Hornsea Project Two (Ref 21. 41): EIA Scoping Report: Harbour and grey seal surveys; • Ossian Chapter 10 (Ref 21. 42): Marine Mammals Array EIA Report 2024; • Outer Dowsing Offshore Wind PEIR Volume 1, Chapter 11 (Ref 21. 43): Marine Mammals; • Hornsea Three (Ref 21. 45); • Dogger Bank A (Ref 21. 46); and • Dogger Bank South (Ref 21. 47). Other applications will be monitored to see if any developments at the pre-consent phase release relevant information which can be used.
JNCC (Ref 21. 4)	Effective deterrence range updated guidance.	Updated effective deterrent ranges (EDRs) for assessing the significance of noise disturbance in harbour porpoise.

Survey work

- 21.4.6 Extensive contemporary and historic information is available regarding abundance and distribution of marine mammals in the North Sea. Following a detailed review to inform the scope of the data and assessment, as presented, no site-specific surveys were undertaken for this topic, the Planning Inspectorate (PINS) was content with this approach, see ID 4.5.13 of the Scoping Opinion.
- 21.4.7 Geophysical surveys were completed for the English Offshore Scheme between April 2025 and June 2025 using Uncrewed Surface Vehicles (USVs). Marine mammal mitigation pre-watches were carried out by marine mammal observers and Passive Acoustic Monitoring (PAM) from nearby support vessels prior to the USV sources being activated in compliance with the JNCC guidelines for minimising the risk of injury to marine mammals from geophysical surveys (Ref 21. 48). No marine mammal sightings were recorded during these surveys.
- 21.4.8 Additionally, Environmental DNA (eDNA) samples were also acquired which recorded the presence of harbour porpoise and minke whale. Although not specifically focused on detection of marine mammals, these observations and results have been used to inform the baseline description for the English Offshore Scheme in this PEIR.

21.5 Overall Baseline

Current baseline

- 21.5.1 This chapter considers marine mammals: cetaceans (whales, dolphins and porpoise); pinnipeds (seals); and the European otter (*Lutra lutra*). Over 28 species of cetacean have been recorded in UK waters, either from observations or strandings records. Of these species, eleven are regular UK visitors, though only seven species are commonly encountered in the study area. Two species of pinniped are resident in UK waters: grey seal (*Halichoerus grypus*) and common or harbour seal (*Phoca vitulina*). European otter although largely terrestrial can inhabit coastal areas and have been seen foraging in a narrow zone close to shore (<80 m) (Ref 21. 49).
- 21.5.2 The purpose of this section is to provide a characterisation of the baseline environment with respect to the range, abundance, density and seasonality of species within and surrounding the draft Order Limits. This section has been split into the following sub-sections to provide an overview of the ecological baseline in the study area:
- Designated Sites;
 - Cetaceans;
 - Pinnipeds; and
 - European Otter.

Designated Sites

- 21.5.3 Within the study area there are several designated sites which protect marine mammals. These are outlined in **Table 21-5** and illustrated in **Volume 3, Part 3, Figure 21-2: Designated Sites within the English Offshore Scheme**. Transboundary sites within 250 km of the draft Order Limits have also been assessed.

21.5.4 Site details are provided under the relevant qualifying feature baseline description in the following sub-sections.

21.5.5 It should be noted that not all of the designated sites identified are located within English waters. A separate Habitats Regulations Assessment Screening (HRA) has been prepared by the Applicant which provides site descriptions and considers all relevant designated sites in compliance with the Habitats Regulations. HRA Screening is included in the documentation supplied for consultation under Section 42 of PA2008. Designated Sites are therefore not considered further within this PEIR.

Table 21-5 Designated protected areas for marine mammals

Protected area	Designation	Species	Distance away from the draft Order Limits
Southern North Sea	SAC	Harbour porpoise	0.0 km
Humber Estuary	SAC	Grey seal	7.69 km
The Wash and North Norfolk Coast	SAC	Harbour seal Otter	16.20 km
Berwickshire and Northumberland Coast	SAC	Grey seal	78.09 km
Southern Trench	Nature Conservation Marine Protected Area (NCMPA)	Minke whale	117.63 km
Klaverbank NL20008002	SAC / SCI	Harbour porpoise Harbour seal Grey seal	130.39 km
Doggersbank NL2008001	SAC / SCI	Harbour porpoise Harbour seal Grey seal	136.44 km
Vlaamse Banken BEMNZ0001	SAC	Harbour porpoise Harbour seal Grey seal	241.28 km
Doggerbank DE1003301	SAC	Harbour porpoise Harbour seal	236.20 km
Bancs des Flandres FR3102002	SAC	Harbour porpoise Harbour seal Grey seal	246.67 km
Sea of Hebrides	NCMPA	Minke whale	340.14 km

Cetaceans

- 21.5.6 Large scale surveys to monitor the cetacean population size have been carried out in UK waters. These surveys were undertaken by SCANS and Cetaceans Offshore Distribution and Abundance in the European Atlantic (CODA) in 1994, 2005 (SCANS II), 2007 (CODA), 2016 (SCANS III Ref 21. 25) and 2022 (SCANS IV Ref 21. 26).
- 21.5.7 Within the waters of the English Offshore Scheme, three cetacean species are regularly recorded, the harbour porpoise, white-beaked dolphin and common minke whale. Although other species such as common dolphin, bottlenose dolphin and minke whale may be present in low numbers (Ref 21. 50; Ref 21. 51; Ref 21. 52).
- 21.5.8 The SCANS IV surveys have been used in this assessment for estimates on species density within the draft Order Limits. The English Offshore Scheme would pass through survey Block NS-C and Block NS-D respectively in the SCANS IV survey (Ref 21. 26). The SCANS blocks in relation to the English Offshore Scheme are illustrated in **Volume 3, Part 3, Figure 21-3: SCANS III and SCANS IV Survey Blocks**.

Table 21-6 Cetacean management units, seasonality, and sightings

Species	Relevant MU	Seasonality	SCANS-IV Density
Harbour porpoise	North Sea	All year	NS-C: 0.6027 NS-D: 0.5985
White- beaked dolphin	Celtic Greater North Sea	Summer	NS-C: 0.0149 NS-D: 0.0799
Common dolphin	Celtic Greater North Sea	Summer	NS-C: 0.0032
Bottlenose dolphin	Greater North Sea	All year	NS-C: 0.0419
Minke Whale	Celtic Greater North Sea	Summer	NS-C: 0.0068 NS-D - 0.0419
Fin Whale	-	-	NS-D: 0.0009

- 21.5.9 Fin whale (*Balaenoptera physalus*) were recorded in the SCANS IV surveys in a block (NS-D) overlapping the northern end of the English Offshore Scheme, however these are a deep-water species and are not typically found within the coastal waters of the central or southern North Sea. Similarly, humpback whale (*Megaptera novaeangliae*) and sperm whale (*Physeter macrocephalus*) were recorded in SeaWatch Foundation observations in 2025. These species are not considered resident within the area and are unlikely to be present during project activities, therefore they are not directly assessed further in this ES.
- 21.5.10 Sightings from marine mammal observations from the English Offshore Scheme's geophysical surveys undertaken between April 2025 and June 2025 were included in baseline data sources, however there were no sightings of marine mammal species during these surveys. Therefore, they have not been used in this assessment. Observations within the English Offshore Scheme survey area for EGL 3 and EGL 4 included sightings of minke whale, white-beaked dolphin, harbour porpoise, and grey seal (Ref 21. 40).

- 21.5.11 During project-specific environmental surveys, eDNA samples were acquired. Harbour porpoise and minke whale, as well as unidentified cetacean and delphinid species were detected across stations.
- 21.5.12 Observations from the Sea Watch Foundation (Ref 21. 31), data from the NBN Atlas (Ref 21. 33) and data from publicly available aerial data from the offshore wind farms in the region (Ref 21. 41, Ref 21. 42, Ref 21. 43, Ref 21. 44, Ref 21. 45, Ref 21. 46 and Ref 21. 47) have been reviewed over the course of the EIA process from preparation of the Scoping Report submitted on 02 September 2025. Whilst the information cannot be used to inform abundance estimates it can indicate seasonality and presence of species. These data sources consistently record the species most likely to be present within the area as harbour porpoise, white-sided dolphin, and minke whale.

Harbour porpoise

- 21.5.13 The harbour porpoise is widespread around the UK. It is the smallest and most common cetacean found within the northwestern European continental shelf waters (Ref 21. 53), as well as being the most populous cetacean in the North Sea.
- 21.5.14 Individuals can grow up to 1.6 m in length, with the females often slightly larger than the males (Ref 21. 54). Typically, they are found in small groups of one to three animals. They generally appear shy, avoiding other species and rarely interact with boats. Due to their size and nature, they are typically difficult to spot for survey purposes. Harbour porpoise must consume up to 10% of their body weight per day (Ref 21. 55; Ref 21. 56; Ref 21. 57), since they have a high metabolism and smaller body size, they need a constant source of energy. The dominant prey species are sandeel, herring, whiting, gobies and sprat (Ref 21. 58; Ref 21. 59).
- 21.5.15 Harbour porpoises are inclined to distribute themselves based on prey availability. Seasonal movements are linked to the maturity of their calves, with most mating and calving occurring between May and August (Ref 21. 60; Ref 21. 61). Increases in inshore waters during the summer months is linked to the need for shelter, increase in energetic demand during calving, and lactation and distribution of prey (Ref 21. 62).
- 21.5.16 Harbour porpoise populations are divided into MUs, with the area of the English Offshore Scheme falling within the North Sea MU. These MUs are designed for conservation and management of human activity. In practice, harbour porpoise act as one continuous population in the North Atlantic.
- 21.5.17 In offshore waters, harbour porpoise tend to avoid high current speeds, flat seafloor, and well-mixed sediment (Ref 21. 63). Frequently, they are encountered in shallower continental shelf waters with a preference for waters at 50 m to 150 m depth (Ref 21. 64; Ref 21. 65). Recent sightings data for this species are shown in **Table 21-6**.

Southern North Sea SAC

- 21.5.18 This SAC is an area of great importance to harbour porpoise in the UK. The site stretches from the central North Sea (North of Dogger Bank) to the Straits of Dover in the south, covering an area of 36,951 km² (Ref 21. 66). It is estimated the site supports 17.5% of the UK North Sea population (Ref 21. 14). The population size was estimated to be between 11,864 and 28,889 individuals in 2019 (Ref 21. 67). In summer animals are more commonly observed in the north section of the SAC; in winter they move to the south. As illustrated in **Volume 3, Part 3, Figure 21-4: Harbour Porpoise Density within the Southern North Sea SAC** the draft Order Limits slightly overlaps the summer and winter grounds.

- 21.5.19 The mating season lasts from April to September, with the majority of calves born between May and August. Animals move closer to the shoreline when breeding, and individuals move north in summer and south in winter months (Ref 21. 25). Their densities in the summer grounds during August are 0.6-0.7 animals per km² in the English Offshore Scheme area. In the winter grounds during January densities reduce to 0.4-0.5 animals per km² in the area surrounding the English Offshore Scheme. The seasonal movement is believed to be linked with the variation in prey distribution (Ref 21. 48).
- 21.5.20 As illustrated in **Volume 3, Part 3, Figure 21-4: Harbour Porpoise Density within the Southern North Sea SAC**, Dogger Bank represents an area of persistent high densities, with high densities recorded in the winter and summer months (Ref 21. 68), indicating that seasonal migration isn't consistent within all areas of the SAC. The English Offshore Scheme lies to the southwest of the Dogger Bank. Another area of higher densities in both summer and winter is observed approximately 12 NM from the coastline from Whitby to Flamborough Head. A portion of the English Offshore Scheme intersects with this area, although it lies outside of the Southern North Sea SAC. In this area, densities during summer peak at 0.7 animals per km². Figure data has been taken from the distribution maps of cetacean and seabird populations in the northeast Atlantic, the animal densities are estimated along transects (Ref 21.32).

Common dolphin

- 21.5.21 The common dolphin can grow up to 2.4 m in length (Ref 21. 69) and is easily identified at sea by the light-coloured hour-glass pattern on their lower flanks. They commonly breach and often bow-ride in groups between 6 and 10 individuals, though larger groups have been frequently recorded.
- 21.5.22 Although commonly seen off the west coast of Britain and Ireland, common dolphin are only occasionally observed in the North Sea, mainly during the summer (June to September) (Ref 21. 20). Common dolphins tend to feed on pelagic fish in the North Sea, such as whiting, mackerel, sandeel and sprat (Ref 21. 70). Their seasonal movements and higher densities in summer are driven by prey availability and higher sea surface temperatures. (Ref 21. 71; Ref 21. 72; Ref 21. 73). Recent sightings data for this species are shown in **Table 21-6**.

White-beaked dolphin

- 21.5.23 The white-beaked dolphin is recognisable by its short, often white, beak. It can grow up to 3.2 m in length (Ref 21. 74). This species frequently displays forward, vertical or side breaches and often bow-rides vessels. The white-beaked dolphin is also known to mix with other dolphins and whales to assist in co-operative food herding.
- 21.5.24 The white-beaked dolphin occurs over a large part of the northern European continental shelf and is frequently recorded in the central and northern North Sea but is only occasionally observed in the southern North Sea. Most sightings are usually in June and October. Inshore movements are associated with calving, which happens in June to September. Males will follow females inshore during this time (Ref 21. 75). Their distribution is also driven by prey. More feeding and nursing grounds are located further inshore, and in the northeast of England there is an area of important habitat between Whitley Bay and Amble, up to 150 individuals have been spotted. Towards the Anderby Creek Landfall in Humber sightings are less common but still occasional (Ref 21. 76). Recent sightings data for this species are shown in **Table 21-6**.

Bottlenose dolphin

- 21.5.25 The bottlenose dolphin is the largest dolphin that frequents British waters, growing up to 4 m in length. They often display forward to sideways breaches, somersaults and tail slaps and frequently bow-ride. Like the white-beaked dolphin they are frequently seen mixing with other species. Group sizes are regularly between two and 25 animals, but individuals can travel in much larger groups, although this is most common in deep water (Ref 21. 20).
- 21.5.26 There are resident populations of this species in Cardigan Bay, Wales and the Moray Firth, Scotland but animals are occasionally sighted in the Southern North Sea (Ref 21. 77). There has been an increase in recordings of bottlenose dolphin in the inshore waters along the northeast coast of England, with peak sightings in the summer (Ref 21. 78). Some individuals may be permanently relocating to English waters (Ref 21. 78). Between 2014 and 2017, 48 individuals were identified utilising the Northumberland-Durham coastline (Ref 21. 79). The movement of animals between the Moray Firth and the Tay Estuary, the two large residency grounds on the northeast coast of England, does have a seasonal pattern. They migrate from the Tay to the Moray Firth in early summer then from the Moray Firth to the Tay estuary in late summer (Ref 21. 80). However, this pattern is not followed consistently by individuals and is considered to be caused by social connections between dolphins, instead of changes in prey (Ref 21. 81; Ref 21. 82). Recent sightings data for this species are shown in **Table 21-6**.

Minke whale

- 21.5.27 The minke whale is the most common and widely distributed of the baleen whales in British waters. They are recorded throughout the northern and central North Sea but are rare visitors to the Southern North Sea.
- 21.5.28 The minke whale is one of smallest of the baleen whales, with an average length of 8.5 m. Spy hopping and breaching are common for this whale, which tend to form groups of about three animals (Ref 21. 83). Although the species occurs year-round, most sightings have been recorded between May and September (Ref 21. 84). Minke whales perform winter migrations between higher latitude summer feeding grounds and low latitude winter breeding grounds (Ref 21. 85). Recent sightings data for this species are shown in **Table 21-6**.

Pinnipeds

- 21.5.29 The Sea Mammal Research Unit (SMRU) at the University of St Andrews provide annual reports on the state of the UK seal populations through the Special Committee on Seals (SCOS). The most recently published report in 2024 (Ref 21. 36) reviewed survey data from between 2016 and 2023 for the two species of seal; harbour seal and grey seal. The data showed an overall decrease in harbour seal populations in English waters of 27%, largely attributed to population declines in southeastern England. The UK grey seal population shows an annual increase of between 0.7% and 1.5%, with the highest rates of increase recorded in western Scotland. All Seal Monitoring Units (SMUs) on the east coast of the UK (both Scottish and English sites) show either stable or increasing trends in grey seal pup production (Ref 21. 36).

Grey seal

- 21.5.30 The grey seal is the larger of the two seal species found in UK waters. Most of their time is spent in open water, only coming to shore in the autumn to form breeding colonies.

Grey seals are often found in areas with gravel or sandy seabeds, which provide the ideal burrowing habitat for sandeels (Ref 21. 86). Grey seals feed on a wide variety of prey including sandeel, cod, saithe and ling (Ref 21. 87). Models of at-sea density revealed distance was the primary driver of distribution, with predicted density declining within increasing distance from haul-outs.

- 21.5.31 The UK population comprises 36% of the global population of grey seal (Ref 21. 88). They prefer remote islands, bays and caves as haul-out areas, where they can give birth to pups and forage for food. Foraging areas can be up to 100 km offshore and are connected to the haul-out by a corridor of use. Breeding takes place during the autumn period and gestation takes around 11 months. Exact pupping varies between year and location; in eastern England pupping occurs between November and December. A large proportion of the grey seal population will be on land and in coastal waters from October to December during pupping season, then again in February and March during the annual moult. During this time, they are particularly vulnerable to disturbance.
- 21.5.32 High usage areas at sea have been demonstrated along the east coast (Ref 21. 88). While the SACs in the east coast account for the majority of pup production (Ref 21. 89), summer haul-out counts and at sea distribution reveals only a small percentage of seals utilise SACs during the summer foraging season (Ref 21. 89) Carter *et al.* (2022 Ref 21. 37) analysis indicates between 21% and 58% of breeding females use different regions for breeding and foraging, suggesting at least some partial migration. The main breeding colonies in terms of pup production in the southeast England SMU occur at Donna Nook, within the Humber Estuary SAC (for which grey seal is present but not a primary reason for site selection), Blakeney Point and Horsey Sands (Ref 21. 89). Outside the breeding season the two haul-out sites that hold the largest number of seals are Donna Nook and Scroby Sands, with other large haul-outs at Blakeney Point and the sandbanks in the northeast corner of The Wash SAC close to Gibraltar Point (Ref 21. 89).
- 21.5.33 Adjacent to the English Offshore Scheme, and within the Northeast England SMU, the Berwickshire and Northumberland Coast SAC has been designated for grey seal breeding. Here the Farne Islands account for more than 90% of the Northeast England SMU (Ref 21. 89). Outside of the breeding season the major haul-outs occur at the Farne Islands, Lindisfarne, and Coquet Islands (Ref 21. 89).
- 21.5.34 **Volume 3, Part 3, Figure 21-5: Grey Seal and Harbour Seal Population Densities** illustrates that the at-sea mean population density changes across the English Offshore Scheme. At the Anderby Creek Landfall, densities are relatively low (0.009% per 25 km²), as the landfall is south of the Donna Nook haul-out. Densities increase to 0.03% per 25 km² after approximately 12 km, as the English Offshore Scheme traverses closer to the Donna Nook haul-out. From about 40 km from the Anderby Creek Landfall, the density decreases to 0.01% per 25 km². Grey seals are not identified close to the English / Scottish border for the EGL 5 Project as it is not within proximity of the foraging areas associated with the Farne Islands and Lindisfarne.
- 21.5.35 Numerous telemetry tagging surveys have been carried out on seal from the haul-out sites along the UK to inform offshore wind farm development. The Dogger Bank Teesside A & B (Ref 21. 90) projects tagged 235 grey seals to identify if they used the offshore windfarm array area. The windfarm zone lies to the east of the English Offshore Scheme and grey seal from the coast would cross the English Offshore Scheme to access the site. Of the pups and adults tagged, two from Donna Nook, five from the Farne Islands, seven from the Isle of May and five from Abertay. This supports the previous conclusions that grey seal will be present throughout the English Offshore Scheme.

Humber Estuary SAC

21.5.36 The closest point of the draft Order Limits is approximately 7.68 km from the Humber Estuary SAC.

21.5.37 This SAC covers an area of 366.57 km² and includes the second largest coastal plain estuary in the UK. The range of salinity, substrate and exposure to wave action influences the estuarine habitats and the range of species that utilise them; including seal, breeding bird assemblage, winter and passage waterfowl, river and sea lamprey, vascular plants and invertebrates (Ref 21. 91). The main haul-out site used throughout the year by grey seal on the Lincolnshire coast is Donna Nook; 9.8 km from the Anderby Creek Landfall (Ref 21. 92). Regular seal population monitoring is undertaken at Donna Nook in the form of ground and aerial pup counts, occurring during pupping season typically in June and July. In August 2022 and 2023, fixed winged surveys were conducted at Donna Nook to Scrooby Sands. Donna Nook exhibited the largest grey seal haul-out on the east coast of the UK; the count increased from approximately 3,500 to 6,000 (Ref 21. 36). SCOS (2024) also notes for the period up to 2022, there is a significant growth in SMUs on the east coast of England.

Berwickshire and Northumberland Coast SAC

21.5.38 The draft Order Limits are approximately 78.0 km from the Berwickshire and Northumberland Coast SAC.

21.5.39 This SAC stretches from Fast Castle Head in Scotland to Alnmouth in England, encompassing both Lindisfarne and the Farne Islands. The site covers an area of 652.26 km² and supports a breeding colony of grey seal which is around 2.5% of annual UK grey seal pup production (Ref 21. 93). Key haul-out sites include Staple Island within the Farne Islands and Holy Islands sands, Lindisfarne.

Harbour (common) seal

21.5.40 The harbour seal is frequently found in British estuaries and on mudflats. Though they spend much of their time at sea they do require land for breeding purposes and therefore haul-out locations are important. The UK population represents 30% of the European population of harbour seal (Ref 21. 36). Foraging areas are much smaller compared to those of grey seal and are typically located within 40 – 50 km (Ref 21. 94) of their haul-out site. They feed on a variety of prey species including sandeel, gadoids, herring, sprat, flatfish, octopus and squid. Their diet varies between seasons and regions, off the coast of Lincolnshire their prey is mainly sandeel, gadoids, and flatfish (Ref 21. 95).

21.5.41 The harbour seal has a slightly shorter gestation period than the grey seal, lasting approximately 10 months. Pupping occurs on land from June to July while the moult is centred around August and extends into September. Harbour seal do not tend to congregate at breeding colonies, with pups able to swim from birth. Rather, they spend most of the time hauled out during the annual moult (Ref 21. 96). Females will lactate for 21 days after birth in June or July before weaning, during this time the female will forage at sea, returning regularly to the pup, limiting at sea distribution. Population counts are conducted in moult and are representative of the highest proportion of the population (Ref 21. 36). The most recent counts between 2020 and 2023 of haul-outs recorded 106 in the Northeast England SMU and 3,361 in the southeast England SMU.

21.5.42 Inshore studies show that harbour seal prefer foraging in waters less than 50 m deep and within 30 km – 50 km of the coastline. Particularly during moults, they must remain close to haul-out sites. Movements are variable, some individuals travel more than 100 km to

sandbank habitats for foraging (Ref 21. 97; Ref 21. 98). This is a possible reflection of competition for food in overpopulated feeding grounds; harbour seal movements are based on distribution of prey (Ref 21. 99; Ref 21. 100).

21.5.43 **Volume 3, Part 3, Figure 21-5: Grey Seal and Harbour Seal Population Density** illustrates that the at-sea mean population density changes across the English Offshore Scheme has a higher density right at the Anderby Creek Landfall, with a mean population density of 0.03%. This stays high for 30 km and then drops to 0.001% further ashore.

The Wash and North Norfolk Coast SAC

21.5.44 The closest point of the draft Order Limits is 16.2 km away from The Wash and North Norfolk Coast SAC.

21.5.45 The SAC encompasses the largest embayment in the UK covering an area of 1,078 km². The extensive intertidal flats here and on the North Norfolk Coast provide ideal conditions for harbour seal breeding and hauling-out in the UK, supporting some 7% of the total UK population. The main harbour seal haul-out site is in the Wash on the Lincolnshire / Norfolk coast. The mean number of harbour seals counted here between 2019 and 2021 was 2,659 (Ref 21. 89). Harbour seals have also been observed hauling out at Donna Nook in Lincolnshire, the mean count here between 2019 and 2021 was 130 (Ref 21. 89). The survey results show significant declines in the population of harbour seals.

European otter

21.5.46 The European otter is a solitary semi-aquatic mammal which occurs in a variety of aquatic habitats such as rivers, streams, lakes, estuaries and on the coast. Coastal-dwelling populations use shallow, inshore marine areas for feeding (Ref 21. 101). Fresh water is used for bathing, and terrestrial areas for resting and breeding. Foraging is limited to coastal areas (Ref 21. 102); the range is dependent on the quality of its habitat and food. There is evidence of otters travelling as far as 80 km for food, but it is more common for their range to be 10 km – 40 km along the coastline. Most feeding is done in waters no less than 3 m deep, but otters are capable of hunting in waters 10 m deep. They can be sighted all year round, but observations tend to peak in May, June, September and October. They have no seasonality and there are no recent records of otter breeding and haul-outs at or around Anderby Creek Landfall.

The Wash and North Norfolk Coast SAC

21.5.47 The closest part of The Wash and North Norfolk Coast SAC lies 16.2 km from the draft Order Limits.

21.5.48 The draft Order Limits and Anderby Creek Landfall falls within the foraging range of European otter from within The Wash and North Norfolk Coast SAC. Otters occur along the North Norfolk coast and can be found in a variety of freshwater and coastal habitats. The conservation objective for the site is to maintain and / or restore the favourable conservation status of the species.

Future Baseline

21.5.49 Marine mammal populations fluctuate over time, making it highly possible that changes will occur during the lifespan of the English Offshore Scheme. Natural processes and cycles play an influential role in controlling the abundance and distribution of marine mammals. However, anthropogenic activity and climate change have been shown to be

the main drivers of an unpredictable future. Therefore, when evaluating the effects of the English Offshore Scheme, it is important to consider potential impacts in the context of a changing climate.

- 21.5.50 Anthropogenic climate change has already led to observable effects in marine ecosystems, including lower ocean productivity, altered food-web dynamics, declines in habitat forming species, changes in species distributions, geographic range shifts and increased disease prevalence (Ref 21. 103; Ref 21. 104). Evidence has shown that the North Sea is experiencing increased sea surface temperatures, with measurements rising by approximately 0.6 Celsius to 0.8 Celsius over the past two decades (Ref 21. 105).
- 21.5.51 The main anthropogenic impacts on marine mammals include fisheries, noise, transportation and offshore developments. Bycatch through active fishing gear is one of the most common threats to cetaceans, closely followed by boat collisions and commercial hunting. It was estimated that between 1991 and 2016, 98% of marine mammal species were at some level of risk within coastal waters (Ref 21. 106).
- 21.5.52 Harbour porpoise in the North Sea remain vulnerable to gillnet bycatch, with UK estimates rising from 1,098 in 2017 to approximately 1,150 in 2018 (Ref 21. 107). Adverse impacts on abundance and distribution are also closely tied to prey availability, potential impacts from pollutants and disease, and uncertain effects of climate change. Despite these pressures evidence has shown that there appears to be no shift in range since 1994 (Ref 21. 108), and therefore the future trend of these species should remain favourable (Ref 21. 109).
- 21.5.53 White-beaked dolphin prefer the cold temperature waters of the North Sea, therefore as a result of rising sea temperatures they may face habitat loss and reduced foraging areas (Ref 21.116). Distribution has been shown to be more stable in northern regions, with fewer animals present in southern regions (Ref 21. 110). However, certain species do not appear to have been impacted by climatic changes in this region, such as bottlenose dolphin, striped dolphin, and Curvier's beaked whale (Ref 21. 111). In the most recent assessment of UK conservation status, white-beaked dolphin is overall stable (good) (Ref 21. 112).
- 21.5.54 The populations of bottlenose dolphin off the east coast of England have increased (Ref 21. 80; Ref 21. 81). The group sizes of bottlenose dolphin are directly related to an abundance in prey but can also be related to social bonds within the population. Although their current range is considered to be stable, the overall assessment of prospects, and conservation status for bottlenose dolphin is unknown, due to limited data on long-term population trends (Ref 21. 67). The impacts affecting their available habitat are not thought to be increasing, and there are no threats identified likely to impact in the next 12 years.
- 21.5.55 In UK waters, the major threats of minke whale are the direct and indirect interactions with fisheries. In Scotland, examination of minke whale strandings between 1990 and 2010 noted that 50% were due to entanglement in static fishing gear (Northridge 2010 Ref 21. 113). Whale abundance in the greater North Sea is stable (Ref 21. 113; Ref 21. 114) and there is no evidence to support that the range of minke whale has changed since 2013 (Ref 21. 115).
- 21.5.56 Grey seal populations have been increasing in the North Sea since the 1960s. Between 2010 and 2016, pup production has increased by 12% per year due to the rapid expansion of newer colonies in Lincolnshire. Data suggests there may have been some immigration to colonies further south, since the rate of increase in the Southern North Sea has been lower in recent years. Populations around the east coast of England may therefore be

reaching carrying capacity. Pup production in the Berwickshire and North Northumberland Coast SAC is continuing to increase and does not show any indication of reaching a peak (Ref 21. 116). Additionally, other threats include entanglement in marine and plastic debris, particularly ghost fishing gear and pollutants. An analysis of Persistent Organic Pollutants (POPs) in blubber from grey seal pups revealed concentrations that could cause a severe toxic effect (Ref 21. 117). Overall, the most recent conservation status assessment is stable (good) (Ref 21. 112).

- 21.5.57 On the east coast of England, harbour seal counts were reduced by approximately half following the 1998 Phocine Distemper Virus (PDV) epidemic, and a third following the 2002 epidemic. However, harbour seal did not show any signs of recovery and therefore continued to decline (Ref 21. 36). Studies suggest that harbour seal are exposed to domoic acid via consumption of contaminated prey. This may have the potential to cause harmful and lethal effects that disrupt population dynamics. Due to the declines recorded, the current UK harbour seal population estimate has been assessed as unfavourable and inadequate.
- 21.5.58 Although various human activities have the potential to adversely affect marine mammals, current evidence suggests that populations of marine mammals are generally assessed as stable / good. However, as the future is uncertain and difficult to predict at a regional scale distribution shifts still may occur.

21.6 Environmental Measures

- 21.6.1 As set out in **Volume 1, Part 1, Chapter 5: PEIR Approach and Methodology**, the environmental measures are characterised as design measures or control and management measures. A range of environmental measures would be implemented as part of the English Offshore Scheme and will be secured in the DML and DCO as relevant. **Table 21-7** outlines how these design and control measures will influence the marine mammal assessment.
- 21.6.2 Design measures that are relevant to the marine mammals assessment are denoted by a (D) in the ID reference column in **Table 21-7**. These are also included in **Volume 2, Part 1, Appendix 5.A Outline Register of Design Measures**.
- 21.6.3 Several management plans will be provided as Outline Management Plans with the DCO application to support the DML. These include an Outline Construction Environmental Management Plan (CEMP), Outline Marine Pollution Contingency Plan (MPCP) and Outline Marine Mammal Mitigation Plan (MMMP). These documents will outline measures to be implemented to comply with legislation (e.g., in relation to the prevention of oil and chemical spills) and best industry practice (e.g., implementation of JNCC guidance to reduce impacts on marine mammals from underwater noise during geophysical surveys) during all phases of the English Offshore Scheme. Final management plans will be submitted in accordance with the DML to discharge the licence conditions. Control and management measures that are relevant to the marine mammals assessment are denoted by a (C) in the ID reference column in **Table 21-7**. These control and management measures are also included within the Outline CEMP that can be found in **Volume 2, Part 1, Appendix 5.C: Outline Construction Environmental Management Plan (CEMP)**. In addition, design measures identified through the EIA process have been applied to avoid or reduce potential significant effects.

Table 21-7 Summary of the environmental measures

Receptor	Potential changes and effects	Environmental measures	ID Reference
Cetaceans Pinnipeds	and Electromagnetic fields (EMF).	HVDC poles would be bundled to minimise the effects of Electromagnetic Fields (EMF) for electrosensitive receptors.	OMT06 (D)
Cetaceans Pinnipeds	and Accidental spills	All oil, fuel and chemical spills would be reported to the Marine Management Organisation (MMO) Marine Pollution response team in accordance with the MPCP.	OMT03 (C)
Cetaceans Pinnipeds	and Accidental spills	Chemicals will be chosen from the list of chemicals approved under the Offshore Chemical Notification Scheme (OCNS)	OMT04 (C)
Cetaceans Pinnipeds	and Underwater changes	noise In accordance with the UK Government (2025) guidance “ <i>Supporting minimising environmental impacts from unexploded ordnance clearance</i> ” the UXO mitigation hierarchy would be followed for any targets identified during the UXO survey and confirmed as UXO.	OMT06 (C)
Cetaceans Pinnipeds	and Underwater changes	noise The Applicant would apply for a separate Marine Licence and European Protected Species Licence for UXO clearance.	OMT07 (C)
Cetaceans Pinnipeds	and Accidental spills	All project vessels must comply with the International Regulations for Preventing Collisions at Sea (COLREGs) (1972), as amended, particularly with respect to the display of lights, shapes and signals. The masters of other vessels are expected to be familiar with and comply with the COLREGs. Additionally, project vessels would adhere to regulations relating to International Convention for the Prevention of Pollution from Ships (the MARPOL Convention 73 / 78) with the aim of preventing and minimising pollution from ships and the Safety of Life at Sea (SOLAS).	OMT08 (C)
Cetaceans Pinnipeds	and Risk of collision	All vessels (exceeding 20 m) shall not exceed 14 knots during construction operations within the draft Order Limits to protect marine mammals from ship strikes.	MM01 (C)
Cetaceans Pinnipeds	and Underwater changes	noise Sub-bottom profiling shall comply with JNCC guidelines for minimising the risk of disturbance to marine mammals.	MM02 (C)

21.7 Scope of the Assessment

Spatial scope and Study Area

21.7.1 The spatial scope of the assessment of marine mammals covers the area of the English Offshore Scheme contained within the draft Order Limits, together with the study areas described in **Table 21-3** and illustrated in **Volume 3, Figure 21-1 Marine Mammal Study Area and Management Units**.

Temporal scope

21.7.2 The temporal scope of the assessment of coastal and marine physical processes is consistent with the period over which the English Offshore Scheme would be carried out. It assumes construction of the English Offshore Scheme will commence in 2030 and cover a period of approximately 5 years. Operation would commence in 2035, with periodic maintenance required during the Operation and Maintenance phase of the English Offshore Scheme. It is assumed that maintenance and repair activities could take place at any time during the life span of the English Offshore Scheme.

21.7.3 The English Offshore Scheme is expected to have a life span of more than 40 years. If decommissioning requires full or partial removal of the English Offshore Scheme at this point in time, then activities and effects associated with the decommissioning phase are expected to be of a similar level to those during the construction phase, albeit with a lesser duration. The Project could also remain operational for a period after the 40 years or be taken out of service and left within the draft Order Limits after 40 years. Acknowledging the complexities of completing a detailed assessment for decommissioning works up to 40 years in the future, based on the information available, the Project has concluded that impacts from decommissioning would be no greater than those during the construction phase. Furthermore, should decommissioning take place it is expected that an assessment in accordance with the legislation and guidance at the time of decommissioning would be undertaken. In addition, it is expected that the DCO will include a requirement for a written scheme of decommissioning for approval by the relevant consenting authority.

Identification of receptors

21.7.4 The principal marine mammal receptors that have been identified as being potentially subject to significant effects are summarised in **Table 21-8**.

Table 21-8 Marine mammal receptors subject to potential effects

Receptor	Reason for consideration
Harbour porpoise	Harbour porpoise, white-beaked dolphin, and minke whale are commonly observed with the English Offshore Scheme throughout the year. Bottlenose dolphin and common dolphin are not likely to be present within the area but have a recorded presence within the wider region and are therefore included here.
White-beaked dolphin	
Bottlenose dolphin	
Common dolphin	

Receptor	Reason for consideration
Minke whale	
Grey seal	Both UK species of pinniped are known to be present within the English Offshore Scheme throughout the year.
Harbour seal	
European otter	Otters are a European Protected Species and although observed within the English Offshore Scheme, the draft Order Limits is within their foraging range from the Wash and North Norfolk Coast SAC where they are a qualifying feature.

Potential effects considered within this assessment

21.7.5 The effects on marine mammal receptors which have the potential to be significant and have been taken forward for detailed assessment are summarised in **Table 21-9**. All potential likely significant effects identified are relevant for each of the three phases of the English Offshore Scheme: construction, Operation and Maintenance (including repair) and decommissioning.

Table 21-9 Marine mammal receptors scoped in for further assessment

Receptor	Likely significant effects
Cetaceans	Changes in supporting habitat and prey availability.
Pinnipeds	Underwater noise changes from presence of project vessels and equipment leading to disturbance.
	Underwater noise changes from geophysical survey (sub-bottom profiler and USBL) leading to disturbance.
	Collision with project vessels and equipment.
	Underwater noise from UXO clearance.
Pinnipeds	Visual disturbance.
European otter	

21.7.6 The receptors / effects detailed in **Table 21-10** have been scoped out from being subject to further assessment because the potential effects are not considered likely to be significant. This was based on evidence provided in the Scoping Report. The Planning Inspectorate agreed with the scoping conclusions.

Table 21-10 Summary of effects scoped out of the marine mammal assessment

Receptors	Potential effect
Cetaceans Pinnipeds	Underwater noise changes from geophysical survey (sub-bottom profiler and USBL) leading to auditory injury.
Cetaceans Marine turtles	Visual disturbance.
Cetaceans Pinnipeds European otter Marine turtles	Underwater noise changes from presence of project vessels and equipment leading to auditory injury. Electromagnetic changes / barrier to species movement. Temperature increase. Accidental Spills (Hydrocarbon & PAH contamination).
European otter Marine turtles	Underwater noise changes from presence of project vessels and equipment leading to disturbance. Collision with project vessels. Changes in supporting habitat and prey availability. Underwater noise changes from geophysical survey (sub-bottom profiler and USBL). Underwater changes from UXO clearance.

21.8 Key Parameters for Assessment

Realistic worst-case design scenario

- 21.8.1 The assessment has followed the Rochdale Envelope approach as outlined in **Volume 1, Part 1, Chapter 4: Description of the Project** and **Volume 1, Part 1, Chapter 5: PEIR Approach and Methodology**. The assessment of effects has been based on the description of the English Offshore Scheme and parameters outlined in **Volume 1, Part 1, Chapter 4: Description of the Project**. However, where there is uncertainty regarding a particular design parameter, the realistic worst-case design parameters are provided below. Effects of greater adverse significance are not likely to arise should any other development scenario to that assessed here be taken forward in the final design scheme, based on details within the Rochdale Envelope (e.g., different infrastructure layout within the draft Order Limits).
- 21.8.2 With regards to underwater noise changes, UXO clearance will be undertaken under a separate Marine Licence application, subject to its own environmental assessments. A high-level overview of the impacts from clearance is provided in this preliminary environmental assessment and will be included in the ES, to provide a holistic overview of construction activities.
- 21.8.3 In relation to marine mammals the assumptions within **Table 21-11** are made regarding the English Offshore Scheme design parameters in order to ensure a realistic worst-case assessment has been undertaken.

Table 21-11 Maximum design scenario for marine mammals and marine reptiles

Impact	Phase			Maximum Design Scenario (MDS)	Justification
	C	O	D		
Prey availability (temporary habitat loss)	✓	✓	✓	<p>Construction</p> <p>Total subtidal temporary habitat disturbance = 13.91 km²</p> <p>Seabed preparation</p> <p>Trenchless technique exit pits – 2 x 750 m²</p> <p>Boulder clearance – 8.46 km², pre-lay plough with swathe of 20 m assumed across approximately 423 km of the English Offshore Scheme (20 m x 423 km of route) (assumed to be within footprint of PLGR).</p> <p>Pre-sweeping – 1.2 km² precautionary footprint for use of trailing suction hopper dredger and / or Controlled Flow Excavation. Precautionary estimate assuming clearance along 60 m width x 20.04 km).</p> <p>Pre-lay grapnel – 12.69 km² footprint with swathe of 30 m x 423 km route length.</p> <p>Cable burial trial trenching –15,000 m² footprint of cable burial trial trenching (15 m x 1,000 m length).</p> <p>Cable installation</p> <p>Impact will occur fully within combined footprint from seabed preparation activities.</p>	<p>The MDS for temporary habitat loss / seabed disturbance relates to activities associated with seabed preparation and cable lay and burial.</p> <p>It should be noted that boulder clearance overlaps with the PLGR footprint.</p> <p>An MDS for intertidal temporary habitat is not included as trenchless technique exit pits will be within the subtidal environment and as such there will be no direct effects on the Intertidal Zone.</p>
				<p>Operation and Maintenance</p> <p>Total subtidal temporary habitat disturbance = 0.315 km²</p>	<p>Assumes 13 cable repairs and eight cable remediations over project lifetime.</p> <p>MDS is or less to that of the construction phase.</p>

Impact	Phase			Maximum Design Scenario (MDS)	Justification	
	C	O	D			
Prey availability (Permanent Loss)	Habitat	✓	✓	De-burial and re-burial of cable failure points across 13 km of bundled cables (15 m cable plough footprint x 13,000 m length).	MDS is similar (or less) to that of the construction phase.	
				<u>Decommissioning</u> Refer to the construction phase MDS.		
				<u>Construction</u> Total permanent habitat loss = 1.94 km²	Maximum effect of permanent habitat loss will occur because of the maximum area of seabed covered by external cable protection and cable crossings protection (i.e., rock berms).	
				Cable protection Cable crossings – 464,000 m ² assuming rock berm 16 m width and 29,000 m in total length (58 crossings) External cable protection – 1,472,000 m ² to reach target burial depth assuming rock berm (16 m width x 92 km remedial external cable protection length).		
				<u>Operation and Maintenance</u> Total permanent habitat loss = 0.336 km²	MDS for operation is external cable protection.	
				External cable protection remediation – 128,000 m ² total length of remediation 8,000 m x 16m width.		
				Cable repairs – 208,000 m ² total length of external cable protection for cable repairs (13,000 m x 16m width).		
				<u>Decommissioning</u> No additional external cable protection will be placed during decommissioning.		
Underwater Changes	Noise	✓	✓	✓	<u>Construction</u> Seabed preparation	A detailed UXO survey will be completed prior to construction. The

Impact	Phase			Maximum Design Scenario (MDS)	Justification
	C	O	D		
				<p>UXO clearance – high-order clearance.</p> <p>Cable installation Trenching operations.</p> <p>Offshore construction indicative dates 2030 - 2035</p>	<p>type, size and number of possible clearances and duration of UXO clearance operations is not known at this stage. The Applicant is not seeking to licence UXO activities in this DCO Application, but a high-level consideration has been provided. Pre-construction works are predicted to generate underwater noise.</p>
				<p><u>Operation and Maintenance</u> Refer to the construction phase MDS.</p>	<p>MDS is similar (or less) to that of the construction phase.</p>
				<p><u>Decommissioning</u> Refer to the construction phase MDS.</p>	<p>MDS is similar (or less) to that of the construction phase.</p>
				<p><u>Construction and decommissioning</u></p>	
Collision with project vessels	✓	✓	✓	<p>Cable laying vessels – Maximum of 17 of vessels on nearshore and offshore campaigns at any one time.</p> <p>Cable laying vessel size 215 m in operation for 60 weeks.</p>	<p>The maximum number of vessels represents the maximum potential for collision risk and disturbance.</p>
Visual disturbance	✓	✓	✓	<p>Indicatively 3,103 return vessel transits across English Offshore Scheme.</p> <p><u>Operation and Maintenance</u> Maximum of 5 vessels per cable repair operation.</p>	

21.9 Assessment Methodology

Overview

- 21.9.1 The marine mammals and marine reptiles assessment generally follows the assessment approach framework as set out in **Part 1, Chapter 5: PEIR Approach and Methodology**. However, while this has informed the approach, it is necessary to set out how this methodology has been applied, and adapted as appropriate, to address the specific needs of the coastal and marine physical processes assessment.
- 21.9.2 In line with the industry standard approach across offshore EIAs, a four-category sensitivity and magnitude scale, from "Negligible" to "High" has been used. While **Part 1, Chapter 5: PEIR Approach and Methodology** provides for a "Very High" category, this is based on onshore specific guidance, rather than being applicable to offshore receptors.
- 21.9.3 Results from other technical aspect chapters, such as **Volume 1, Part 3, Chapter 17: Coastal and Marine Physical Processes**, **Volume 1, Part 3, Chapter 18: Intertidal and Subtidal Benthic Ecology** and **Volume 1, Part 3, Chapter 19: Fish and Shellfish** would be used to establish the potential impacts on supporting habitat and prey species for marine mammals.
- 21.9.4 The criteria for characterising the value and sensitivity and magnitude for marine mammals are outlined in **Table 21-12** and **Table 21-13**, respectively.
- 21.9.5 The assessment of sensitivity will be made with consideration of the vulnerability of the receptor to an impact and its ability to adapt, tolerate, and recover. Vulnerability can differ between different groups and species of marine mammal and will also vary depending on the impact pathway. For example, seal species are more sensitive to visual disturbance than cetaceans, whilst sensitivity to underwater noise changes differs between cetacean species depending on their ability to hear and detect certain frequencies.
- 21.9.6 It should be noted that some cetaceans and otters are considered to have a high importance / value, as they are listed under Schedule 1 of the UK Habitats Regulations as EPS and in need of strict protection. However, receptor value / importance has not been included in the sensitivity assessment, as this would obscure meaningful differences in species' abilities to adapt to, tolerate, or recover from a given impact. It should be noted that due to their importance, these species are also considered in HRA process as required by the Habitats Regulations where they are a designated feature of a site.
- 21.9.7 The assessment of magnitude will be made with consideration of the extent of the area impacted, the duration and frequency of the impact and the scale of the change (i.e., whether it has an effect at an individual or population level). When determining the magnitude of impacts, the life history and ecology of the receptors is important. Factors such as seasonality of presence or whether specific areas are required for a certain life stage which the species may be unwilling or unable to move away from are considered.
- 21.9.8 The EIA will use available evidence, professional judgement and knowledge of marine mammal ecology and behaviour to determine the level of impact.
- 21.9.9 The latest peer-reviewed impact thresholds reported in Southall *et al.* (2021) (Ref 21. 11) and the National Marine Fisheries Service (NMFS) (Ref 21. 10) will be used to provide a quantitative prediction of the number of animals at risk. This information will consider the best available scientific evidence on the movement and behaviour of marine mammals, both under baseline conditions and would calculate the probability of animals being exposed to sufficient noise levels to cause behavioural disturbance.

21.9.10 The significance of an effect, either adverse or beneficial, is determined using a combination of the magnitude of the impact and the sensitivity of the receptor. A matrix approach would be used throughout all topic areas to ensure a consistent approach within the assessment. This is described further in **Table 5-3 of Volume 1, Part 1, Chapter 5: PEIR Approach and Methodology**.

Table 21-12 Definitions of sensitivity for marine mammals

Receptor sensitivity	Definition
High	No ability to adapt, tolerate, or recover such that survival and reproduction rates are affected and the population cannot recover. Recovery will take longer than 10 years following the cessation of activity or will not occur. The licensable activity is taking place during a sensitive season.
Medium	Limited ability to adapt, tolerate, or recover such that survival and / or reproduction rates may be affected and / or limited ability for the animal to recover. Recovery to pre-impact conditions is possible between 5 and 10 years.
Low	Some tolerance such as ability adapt, tolerate, or recover such that survival is not affected, and reproduction rates are not affected in the medium term. Recovery to pre-impact conditions between one and five years.
Negligible	Receptor is able to adapt, tolerate, or recover such that survival and reproduction rates of individuals are not affected. Recovery expected to be relatively rapid (i.e., less than approximately six months following cessation of activity).

Table 21-13 Definitions of magnitude criteria for marine mammals

Impact magnitude	Definition
High	The impact will affect the behaviour and distribution of sufficient numbers of a species, that the favourable conservation status for the relevant MU / population is adversely affected.
Medium	Temporary changes in behaviour and / or distribution of individuals during a key season such that it would result in potential reductions to reproductive success for the population. Permanent effects on individuals that may influence survival but not at a level that would affect the favourable conservation status of the population.
Low	Short-term and / or intermittent and temporary behaviour effects in a small proportion of the population. Survival and reproductive rates very unlikely to be impacted to the extent that population effects are measured.
Negligible	Very short-term, recoverable effect on the behaviour and / or distribution in a very small proportion of the population.

Table 21-14 Significance matrix

Sensitivity or value	Magnitude of change			
	High	Medium	Low	Negligible
High	Major (significant)	Major (significant)	Moderate (potentially significant)	Minor (not significant)
Medium	Major (significant)	Moderate (potentially significant)	Minor (not significant)	Minor (not significant)
Low	Moderate (potentially significant)	Minor (not significant)	Minor (not significant)	Negligible (not significant)
Negligible	Minor (not significant)	Minor (not significant)	Negligible (not significant)	Negligible (not significant)

Preliminary Assessment of Cumulative Effects

21.9.11 At the current stage of the English Offshore Scheme (PEIR stage), design information is insufficient to allow for a robust cumulative assessment to be undertaken. Therefore, a cumulative assessment has not been undertaken at this stage; however, **Volume 1, Part 4, Chapter 27: Cumulative Effects** and **Volume 2, Part 4, Appendix 27.A: Long List of other Developments** present the long and short lists of ‘other developments’ for the inter-project cumulative effects which will be considered at the ES stage (with updates as necessary), and the methodology which allowed for the identification of these other developments, to allow consultation bodies to form a view and provide comment on the other developments included. The long list will be reviewed and if necessary, updated, in the lead up to the ES, as Project design further evolves and in response to any comments raised at statutory consultation.

21.10 Preliminary Impact Assessment of Changes in Supporting Habitat and Prey Availability

21.10.1 Marine mammals have various prey species they feed on and can travel great distances to forage. The three common species to the English Offshore Scheme (harbour porpoise, white-beaked dolphin and minke whale) are opportunistic hunters, feeding on a variety of fish (haddock, hake, cod, herring, whiting, sandeel, mackerel, salmon and flatfish), cephalopod species (squid and octopi), and crustaceans (shrimp and crabs) but herring, mackerel and sandeel are often preferred prey.

21.10.2 Activities that lead to temporary or permanent habitat loss may indirectly affect marine mammals through impacts on the availability of prey species. Disturbance of the seabed during the spawning season for species with a demersal life stage (such as sandeel and herring) could have a direct impact on the spawning biomass for a specific year group, leading to a shortage of prey species for marine mammals in subsequent years.

21.10.3 Other impacts on prey species such as underwater noise, temporary increase and deposition of suspended sediments and sediment heat changes could also combine with temporary and permanent habitat loss further leading to a change in prey availability.

- 21.10.4 Displacement of prey species may result in greater foraging distances to locate prey, leading to an energetic cost for predators. For example, loss of a preferred prey close to a haul-out site during pupping season would increase the amount of time seals are at sea or lead to lower food availability for pup inhibiting survival.
- 21.10.5 Harbour porpoises are considered to have higher metabolic rates than land mammals of a similar size and are therefore highly dependent on year-round proximity to reliable food sources (Ref 21. 66). The maintenance of supporting habitats and processes to ensure the provision of prey species for marine mammals is therefore a key consideration in maintaining the favourable conservation status of the individual species.
- 21.10.6 The marine mammal species present within the study area have wide foraging ranges within the North Sea and forage on a variety of prey species. As a result, they are considered to be generally tolerant of small-scale changes to prey availability such as that caused by localised disturbance, due to the availability of alternative foraging habitat. Therefore, the sensitivity of the receptor for all marine mammal species present within the English Offshore Scheme has been assessed as low.
- 21.10.7 The worst-case footprint for temporary and permanent habitat loss as presented in Section 21.8 and in the preliminary assessment sections above predict that 13.91 km² of seabed will be disturbed by the English Offshore Scheme. **Volume 1, Part 3, Chapter 19: Fish and Shellfish** assessed several impacts on fish and shellfish including temporary and permanent habitat loss, temporary increases and deposition of suspended sediments, underwater noise changes, temperature increases and electromagnetic changes. No conclusive records of a decline in catch rates have been noted following geophysical survey activities (Ref 21. 118), which suggests that fish return to areas after the temporary displacement. The preliminary assessment concluded that the English Offshore Scheme would not have a significant adverse effect on fish and shellfish ecology. No impact on stock recruitment is predicted and therefore there are no effects predicted on the availability or distribution of prey species. The magnitude of the impact for all marine mammal species present within the English Offshore Scheme has therefore been assessed as low.
- 21.10.8 Intermittent and temporary behavioural impacts may be observed in a small portion of the marine mammal population if animals avoid the English Offshore Scheme during periods of high activity, but as they already use wide foraging areas, individual survival and reproduction rates are not predicted to be affected.
- 21.10.9 The assessment therefore concludes that the significance of the effect is **Minor and Not Significant**.

21.11 Preliminary Impact Assessment of Underwater Noise Changes – Geophysical Survey

Context

- 21.11.1 Cetaceans and pinnipeds have evolved to use sound as an important aid in navigation, communication and hunting. It is generally accepted that exposure at close range to high noise levels can cause permanent or temporary hearing damage and even, in extreme circumstances, gross physical trauma. At wider ranges or lower source levels, the introduction of additional noise could potentially cause short-term behavioural changes, affecting for example the ability of a species to communicate and to determine the presence of predators, food, or underwater features and obstructions. If a receptor is

displaced from the zone of disturbance until the activity has passed, they may experience disrupted foraging, breeding and migratory patterns.

- 21.11.2 Sound is readily transmitted into the underwater environment and there is potential for the noise emissions from construction, Operation and Maintenance, and decommissioning of the English Offshore Scheme to affect marine mammals. The PEIR therefore considers the potential for behavioural disturbance.
- 21.11.3 Noise can be broadly categorised as being either impulsive or continuous in nature. As defined by Southall *et al.* (2007), impulsive sounds are brief, broadband, atonal transients such as explosions, gunshots, airgun pulses and pile driving strikes. These sounds are characterised by a rapid rise from ambient to maximum pressure followed by a decay period that may include oscillations. The rapid rise time ensures that pulses are broadband and capable of producing greater potential for physical injury. In contrast, non-pulsed (non-impulsive) sounds may be tonal, broadband, or both, and can be continuous or intermittent in character. They lack the sharp rise and decay times of pulses and typically have lower peak pressures. Examples include vessels, machinery, wind turbines, and many active sonar systems (Ref 21. 10, Ref 21. 12, Ref 21. 13, Ref 21. 119 ; Ref 21. 114, Ref 21. 120).
- 21.11.4 Underwater noise propagation modelling has been undertaken for the English Offshore Scheme to inform the EIA. **Volume 2, Part 3, Appendix 21.A: Eastern Green Link 3 and 4 Underwater Noise Modelling Technical Report** provides a summary of acoustic concepts and terminology, acoustic assessment criteria, estimated source noise levels and provides the approach taken and results of the underwater noise propagation modelling. The report uses sound propagation models to calculate the impact ranges to marine mammals from each phase of the English Offshore Scheme for three key modelled sources:
- Geophysical surveys - non-impulsive sound sources;
 - Vessels and equipment - non-impulsive sound sources; and
 - Clearance of UXO - an impulsive sound source.
- 21.11.5 The geophysical sources discussed within the assessment are considered non-impulsive in nature. The impulsive thresholds in the cited guidance documents are derived primarily from temporary threshold shift (TTS) data, based on playbacks of impulsive sources such as airguns and piling, whereas non-impulsive thresholds are based on exposures to sonar-type and other non-impulsive sources (see Appendix A of Ref 21. 10). Therefore, sonar-based geophysical systems should be treated as non-impulsive, while broadband impulsive sources such as airguns and sparkers would fall within the impulsive category.
- 21.11.6 Marine mammals are not equally sensitive to noise at all frequencies and have different hearing sensitivity thresholds. The underwater noise propagation modelling calculates the received noise level at different distances from the source. To determine the potential consequences of these received levels on any marine mammals, it is necessary to relate the levels to known or estimated potential impact thresholds. The latest peer reviewed disturbance thresholds (Ref 21. 12, Ref 21. 10) have been used in this assessment. These are described and explained in **Volume 2, Part 3, Appendix 21.A: Eastern Green Link 3 and 4 Underwater Noise Modelling Technical Report**. The approaches separate marine mammals into five groups based on their functional hearing (i.e., the frequency characteristics such as bandwidth and noise level within which acoustic signals can be perceived and therefore are assumed to have auditory effects). The categories relevant to this assessment are:

- Low Frequency (LF) cetaceans: marine mammal species such as baleen whales (e.g., minke whale).
- High Frequency (HF) cetaceans: marine mammal species such as dolphins, toothed whales, beaked whales and bottlenose whales (e.g., bottlenose dolphin and white-beaked dolphin).
- Very High Frequency (VHF) cetaceans: marine mammal species such as true porpoises, river dolphins and pygmy / dwarf sperm whales and some oceanic dolphins, generally with auditory centre frequencies above 100 kHz) (e.g., harbour porpoise).
- Phocid Carnivores in Water (PCW): true seals (e.g., harbour seal and grey seal); hearing in air is considered separately in the group Phocid Carnivores in Air (PCA).

Geophysical Survey (non-impulsive noise)

- 21.11.7 During construction, operation and maintenance, and decommissioning, several noise-generating devices would be used: multi-beam echosounder (MBES), side scan sonar (SSS), and sub-bottom profiler (SBP), as well as ultra-short baseline (USBL) positioning devices. These devices are classed as non-impulsive noise because they generally comprise a single (or multiple discrete) frequency as opposed to a broadband signal. The equipment can typically work at a range of signal frequencies, depending on the distance to the bottom and the required resolution. The signal is highly directional and acts as a beam, with the energy narrowly concentrated within a few degrees of the direction in which it is aimed. This effectively means that there is only the potential for auditory disturbance if a marine mammal is directly within the main beam of the sound source. Once the animal moves outside of the main beam there is little potential for injury.
- 21.11.8 For geophysical surveys it is best practice to follow the JNCC guidelines for minimising the risk of injury to marine mammals from geophysical surveys (Ref 21. 9). Adherence to the guidelines constitutes best practice and will, in most cases, reduce the risk of deliberate injury to marine mammals to negligible levels.
- 21.11.9 The guidelines state that MBES surveys in shallow waters (<200 m) use higher frequencies that typically fall outside the hearing frequencies of cetaceans and that the sounds produced are likely to attenuate more quickly than the lower frequencies used in deeper waters. JNCC do not, therefore, advise that mitigation is required for MBES surveys in shallow waters. SSS equipment is similar and mitigation is not required for these surveys. This preliminary environmental assessment therefore focuses on the use of SBP and USBL. It should be noted that new draft guidance was issued for consultation by JNCC in February 2025. The draft 2025 guidelines do not differ from the 2017 guidance at this point, and the English Offshore Scheme will continue to monitor the progress of the guidance for the ES.

Disturbance

Cetaceans and Pinnipeds

- 21.11.10 For geophysical surveys, an effective deterrence range (EDR) of 3 km may be assumed based on JNCC et al., (Ref 21. 4). Although this EDR is provided for harbour porpoise, as the species represents the most sensitive functional hearing group, it is used as a worst-case proxy for other species. This indicates that disturbance effects may be observed in a 3 km radius from the source.

- 21.11.11 The geophysical surveys would be transient in any one location, moving in a linear nature through the English Offshore Scheme. Approximately 78.5 km² of sea would experience underwater noise changes sufficient to cause disturbance effects at any one time. This Zol would move as the survey progresses. JNCC et al. (2010) guidance suggests that SBP noise “*could, in a few cases, cause localised short-term impacts on behaviour such as avoidance. However, it is unlikely that this would be considered as disturbance in the terms of the Regulations*”.
- 21.11.12 There is evidence that cetaceans exhibit short-term behavioural responses to geophysical surveys, as seen through multiple studies (Ref 21. 121, Ref 21. 120, Ref 21. 122, Ref 21. 123). However, the geophysical surveys are temporary and transient and animals are able to return to the English Offshore Scheme as soon as the vessel passes through; as evidenced by observations following a 2D seismic survey in the Moray Firth, where harbour porpoise returned to the area within a few hours of survey stopping (Ref 21. 124). Disturbance will therefore fit under the JNCC et al., (Ref 21. 125) classification of trivial as it will only lead to “*sporadic disturbances without any likely negative impact on the species*”.
- 21.11.13 Animals are therefore likely to be able to tolerate short-term displacement from project activities and return to the English Offshore Scheme as soon as the vessel passes through, such that survival is not affected, and reproduction rates are not affected in the medium term. The sensitivity of cetaceans to disturbance is therefore precautionarily assessed as low.
- 21.11.14 As disturbance effects from geophysical surveys are likely to be very short term, with a recoverable effect on the behaviour and/or distribution in a very small proportion of the population, the magnitude of the impact has been assessed as negligible.
- 21.11.15 The significance of the effect has been assessed as **Negligible** and **Not Significant**.

21.12 Preliminary Impact Assessment of Underwater Noise Changes – Project Vessels and Equipment (non-impulsive noise)

- 21.12.1 Of the species present, the most sensitive to non-impulsive noise from project vessels and equipment are VHF cetaceans. This assessment is based on the potential impact ranges predicted for the VHF cetaceans. **Volume 2, Part 3, Appendix 21.A: Eastern Green Link 3 and 4 Underwater Noise Modelling Technical Report, Table 6-14 and Table 6-15** indicate that:
- Noise levels sufficient to cause disturbance could be experienced by all species up to 2.8 km for vessels.
- 21.12.2 Harbour porpoise, a VHF cetacean, is the designated feature of the Southern North Sea SAC. Modelling has indicated that they could experience disturbance if present in close proximity to a trailing suction hopper dredger, however individuals are likely to be able to tolerate the disturbance and return to any area of displacement shortly after cessation of activities or after vessels have passed through the area (Ref 21. 126). Therefore, survival and reproduction rates are unlikely to be affected, and recovery is likely to be limited to a few hours as seen through short-term disturbance responses as a result of geophysical surveys. The sensitivity of this species to vessel noise has therefore been assessed as negligible.

- 21.12.3 There is a considerable degree of uncertainty and variability in the onset of disturbance and therefore any disturbance ranges should be treated as potentially over precautionary. Another important consideration is that vessels and construction noise will be temporary and transitory, as opposed to permanent and fixed. In this respect, construction noise is unlikely to differ significantly from vessel traffic already in the area. Animals within the southern and central North Sea are subject to high levels of shipping traffic and are habituated to vessel movements.
- 21.12.4 Disturbance will therefore fit under the JNCC *et al.*, 2010 (Ref 21. 125) classification of trivial as it will only lead to “*sporadic disturbances without any likely negative impact on the species*”. Based on the discussion above, the magnitude of the impact has been assessed as low.
- 21.12.5 The overall significance of the effect has been assessed as **Negligible** and **Not Significant**.

21.13 Preliminary Impact Assessment of Underwater Noise Changes – UXO Clearance

- 21.13.1 UXO clearance for the English Offshore Scheme is not being consented under the DCO; a separate Marine Licence will be applied for.
- 21.13.2 The below high-level assessment is provided at the request of the SNCBs for information only and to provide a holistic overview of all impacts associated with the English Offshore Scheme.
- 21.13.3 UXO clearance is a term used to describe finding, removing and safely disposing of unexploded ordnance (e.g., bombs, shells and landmines). It follows a systematic process and mitigation hierarchy, whereby avoidance is the preferred option and in-situ controlled clearance of the UXO using a high order method is the least preferred option; only undertaken if all other options have failed or if there is an exceptional circumstance.
- 21.13.4 A high order clearance has been a traditional method used, whereby a donor charge is placed next to the UXO and detonated, causing a chain reaction that detonates the UXO. High order clearances are characterised by a rapid, strong shock wave.
- 21.13.5 Low order clearance methods like deflagration are designed to render UXO harmless by burning out the explosive content so that the UXO does not detonate in a high order manner. A single charge of 30 g – 80 g Net Explosive Quantity (NEQ) is placed proximal to the UXO. When detonated, a shaped charge penetrates the casing of the UXO to introduce a small, clinical plasma jet into the main explosive filling. The intention is to excite the explosive molecules within the main filling to generate enough pressure to burst the UXO casing, producing a deflagration of the main filling and neutralising the UXO. It is possible that some residual explosive material remains on the seabed following deflagration. In this case, recovery will be performed which may require a small (500 g) ‘clearing shot’.
- 21.13.6 In January 2025, guidance from the UK Government was published - “*Supporting minimising environmental impacts from unexploded ordnance clearance*”. This sets out that when applying for a Marine Licence if no alternatives in the UXO mitigation hierarchy exist the default method of clearance should be low noise methods in the first instance e.g., low order clearance / deflagration as opposed to high order clearance, though high order may be considered on exception as per Defra guidance.

21.13.7 The precise details and locations of potential UXOs is unknown at this time. A UXO survey and identification campaign would be completed as part of the seabed preparation works during pre-construction activities. Any confirmed UXO will be marked and the below UXO mitigation hierarchy would be followed:

- Avoid the UXO by micro-routing the cables a safe distance away;
- Safely remove UXO to an alternative seabed position;
- Safely remove UXO to surface for onshore disposal;
- Clearance of in-situ using low order method; and
- Clearance of in-situ using high order method.

21.13.8 High order clearance would only be considered if the low order method was not suitable for the UXO or it had failed after a minimum of three attempts and there is prior agreement with the MMO.

21.13.9 For the purposes of this assessment, it has been assumed that the worst case UXO size will be 697 kg NEQ, with a most-likely scenario requiring clearance of 295 kg. 697 kg represents the largest charge known to have been historically found in the study area.

21.13.10 Underwater noise propagation modelling has been undertaken for various scenarios to establish predict injury and disturbance ranges for marine mammals. **Volume 2, Part 3, Appendix 21.A: Eastern Green Link 3 and 4 Underwater Noise Modelling Technical Report** presents the approach, results and predicted injury and disturbance ranges for the following scenarios:

- Low order clearance (deflagration) using an 80 g charge;
- Clearing shot using a 500 g charge;
- High order clearance of a 295 kg UXO; and
- High order clearance of a 697 kg UXO.

Low order clearance

21.13.11 Harbour porpoise are a designated feature of the Southern North Sea SAC and are typically one of the most sensitive species to underwater noise changes. However, noise models indicate that the acoustic energy from high order UXO clearances is concentrated within the lower frequency band (e.g., below several hundred Hz) (Ref 21. 127; Ref 21. 128), which is below the band of peak sensitivity for harbour porpoise (105 kHz; Ref 21. 12). Therefore, if PTS were to occur in individuals within this frequency band it would be unlikely to result in a significant impact on vital rates of porpoise, or of HF or PCW functional hearing groups. These species are therefore assessed as having a **low** sensitivity to PTS from UXO clearance. However, the low-frequency band associated with UXO clearance does overlap with the region of peak hearing for LF cetaceans, such as minke whale (200 Hz – 19 kHz), therefore, the sensitivity of marine mammals to PTS from UXO has been precautionarily assessed as medium. This will be reviewed and will be updated if appropriate during the ES process.

21.13.12 For low order clearance (80 g charge), the greatest PTS range occurs for VHF cetaceans at 685 m according to Southall *et al.*, 2019 criteria (Ref 21. 12). An impact range for behavioural disturbance of 2,455 m has been predicted for multiple clearances in a 24-hour period or 1,480 m for a single clearance, for VHF cetaceans according to the NMFS 2024 criteria (Ref 21. 10).

21.13.13 For the use of a clearing shot (500 g), the greatest PTS range occurs for VHF cetaceans at 1,265 m according to Southall *et al.*, 2019 criteria (Ref 21. 12). An impact range for behavioural disturbance of 3,735 m has been predicted for multiple clearances in a 24-hour period or 2,475 m for a single clearance, for VHF cetaceans according to the NMFS 2024 criteria (Ref 21. 10) but noting that the disturbance range is higher at 4,010 m for multiple clearances in a 24-hr period of low frequency cetaceans.

21.13.14 The modelling indicates that even with low order clearance (considered to be the mitigated approach) there is still a relatively large release of impulsive sound. With a PTS range of 1,265 m the impact area would be 5.03 km², resulting in PTS-onset in 3 individual harbour porpoise, equating to 0.000009% of the MU (Ref 21. 14). The magnitude of the impact has therefore been assessed as low.

21.13.15 The assessment concluded that for low order clearance of UXO, the effect is **Minor and Not Significant**.

21.13.16 Mitigation would need to be agreed with JNCC / Natural England once the details of the UXO is known, but in accordance with the “*JNCC guidelines for minimising the risk of injury to marine mammals from unexploded ordnance (UXO) clearance in the marine environment*” (Ref 21. 6) would likely include some or all of the following:

- An agreed Marine Mammal Mitigation Plan would be in place for the activity.
- Works would only take place during day light hours with visibility greater than one nautical mile.
- Pre-clearance searches (at least 60 minutes in length) would be carried using at least two dedicated marine mammal observers and passive acoustic monitoring to ensure the mitigation zone is clear of marine mammals before clearance commences. The mitigation zone would be agreed with the MMO but would be a minimum of 1 km radii.
- The use of a noise abatement system (such as bubble curtains) would be discussed with the Marine Management Organisation and JNCC / Natural England. The effectiveness of bubble curtains often depends on the water depth and current speed and may not always be appropriate. In addition, they may not be required if the size of the charge is lower than has been modelled.
- The use of acoustic deterrent devices would be considered if the mitigation zone is greater than 1 km.
- A Wildlife Licence would be applied for in addition to the Marine Licence.
- Timing restrictions e.g., restricting clearance work to one clearance per day, restricting clearance activity to a particular day, week, month or season. This is particularly pertinent to clearance activity within the Southern North Sea SAC where there is the potential for cumulative effects with other marine developments.

21.13.17 Following the JNCC *et al.*, (Ref 21. 6) guidance on whether activities constitute an offence under the Habitats Regulations it can be concluded that with mitigation, the impact of noise produced by UXO low order clearance will not be detrimental to the maintenance of the populations of the species concerned at a favourable conservation status in their natural range. The implementation of mitigation reduces both the sensitivity of the animals present and the magnitude of the impact.

21.13.18 Using the impact range of 2,455 m for behavioural responses in VHF cetaceans and area of 18.93 km² would be affected within the Southern North Sea SAC for each low order clearance. This represents 0.07% of the summer grounds and 0.15% of the winter

grounds. According to the guidance from JNCC, (2025) these values are below the thresholds for significant noise disturbance.

21.13.19 The assessment has concluded that for low order clearance the effect is **not significant**.

High order clearance

21.13.20 High order clearance would only be considered in exceptional circumstances and assessment has been provided at the request of the SNCBs.

21.13.21 The sensitivity of marine mammal species to UXO has been assessed in Section 21.13.11. The sensitivity has been assessed as medium.

21.13.22 For high order clearance PTS occurs for VHF cetaceans at 10.57 km (295 kg charge) and 14.08 km (697 kg charge) according to Southall *et al.*, (Ref 21. 12) criteria. With a PTS range of 14.08 km, the impact area would be 622,81 km², resulting in PTS-onset in ~376 harbour porpoise, equating to 0.001% of the MU (Ref 21. 14). This is far below the level at which an impact on the favourable conservation status for the MU would be adversely affected.

21.13.23 An impact range for behavioural disturbance of 10 km – 64 km has been predicted for multiple clearances in a 24-hour period (depending on the functional hearing group and the charge size) or 25.9 km for a single clearance of a 697 kg charge, for VHF cetaceans according to the NMFS (Ref 21. 10) criteria. It should be noted that the impact range for behavioural disturbance for LF cetaceans at 47 km (295 kg charge) and 64 km (697 kg charge) are thought to be highly precautionary. Further, JNCC (2020) guidance states (in regard to proposed EDR for high order UXOs) that “*a one-off explosion would probably only elicit a startle response and would not cause widespread and prolonged displacement*”. This guidance has been updated in 2025 (Ref 21. 4) and the EDR has been reduced to 20 km (from 26 km). However, it is possible that multiple clearances may be required within the study area.

21.13.24 The magnitude of the impact has therefore been precautionarily assessed as medium as disturbance effects could occur over wide areas without appropriate mitigation.

21.13.25 The assessment concluded that the effect is **moderate (potentially significant)**. However, mitigation would be applied according to best practice.

21.13.26 As discussed above, high order clearance would not occur without appropriate mitigation. Activities would be conducted in accordance with JNCC guidelines for minimising the risk of injury to marine mammals from UXO clearance in the marine environment (2025). Mitigation would need to be agreed with JNCC / Natural England once the details of the UXO is known but would likely include some or all of the points listed under mitigation for low order clearance.

21.13.27 Following the implementation of mitigation measures, the magnitude of impact is low and therefore the effect is **minor (not significant)**.

21.14 Preliminary Impact Assessment of Collision with Project Vessels

21.14.1 Vessels would be used throughout the lifecycle of the English Offshore Scheme. The greatest requirements would be during construction and decommissioning when multiple vessels may be working within the draft Order Limits at any one time. During operation,

the use of vessels would be reduced significantly to periodic inspection surveys, sporadic maintenance or repair works on an 'as needed' basis.

- 21.14.2 Shipping collision is a recognised cause of marine mammal mortality worldwide. The key factor influencing the injury or mortality caused by collisions is ship size and speed, with most severe injuries occurring when vessels are travelling at over 14 knots (Ref 21. 129). As outlined in the Scoping Report the Applicant has committed to ensuring that all vessels (exceeding 20 m) shall not exceed 14 knots during operations within the draft Order Limits to protect marine mammals from ship strikes. This environmental measure would be secured through the CEMP.
- 21.14.3 Marine mammal species are well equipped to move away from oncoming vessels before a collision, although avoidance behaviour around vessels depends on the species. Minke whale and white-beaked dolphin are more accustomed to vessel noise (Ref 21. 130), so may not immediately change behaviour to move away. Socialising white-beaked dolphin are known to approach vessels, though they are more likely to show no response if foraging or resting (Ref 21. 130). Seal responses to vessel presence vary, as they are avoidant when vessels are within 100 m of a haul-out but regularly swim up to tourist boats (Ref 21. 130).
- 21.14.4 During all phases of the English Offshore Scheme, the sensitivity of the receptor has been assessed as medium. Although vessel collisions often lead to mortality in marine mammals (Ref 21. 131), and it is likely that deaths from collisions are underreported (Ref 21. 132). There have also been reports of non-lethal collisions of large whales (Ref 21. 133). There is already a high level of shipping activity in the region where marine mammal densities are the highest. For example, grey and harbour seal densities are elevated (in comparison to further offshore) close to the coastline around the Humber Estuary Approaches. This area is the main approach channel for the Humber Ports, with shipping density averaging between 10 and 26 hours per km². Animals are therefore likely to be habituated to shipping movements. Additionally, vessels associated with the English Offshore Scheme would be slow moving, typically less than five knots and animals will be able to take avoidance action.
- 21.14.5 Avoidance behaviour may be exhibited by a small number of individuals, but due to the temporary and transient nature of project vessels, the risk of collision is very low, and the survival rates and reproduction rates for the various cetacean and pinniped populations will not be impacted. The magnitude of the impact has been assessed as low.
- 21.14.6 Overall, for all phases, the significance of the effect has been assessed as **minor** and **not significant**.

21.15 Preliminary Impact Assessment of Visual Disturbance to Hauled-Out Pinnipeds and to Otter

- 21.15.1 Visual disturbance is predicted in the within the English Offshore Scheme during the construction, Operation and Maintenance and decommissioning phase. As other marine mammals are fully aquatic this effect is only considered for hauled out pinnipeds and otter.
- 21.15.2 Vessel traffic poses a disturbance risk to pinnipeds at haul-out sites, which can have further adverse implications such as reducing haul-out time and can often trigger early foraging trips before hauling out at the next low tide (Ref 21. 134). Additionally, extended inter-haul-out trips have also been documented (Ref 21. 135), which can affect critical periods such as moulting and breeding when haul-out behaviour is essential. Land-based

disturbance such as water sport activities (kayaking) have been known to cause more disruption compared to vessel activity (Ref 21. 136). Additionally, the region is already used by large ships, ferries and animals are therefore likely to be habituated to a certain degree to the presence of vessels. Evidence suggests that in areas of high vessel traffic habituation of pinnipeds increases and therefore further reducing disturbance behaviour (Ref 21. 137). Research shows that flushing for pinnipeds can occur from 200 m away if pups are present (Ref 21. 138). Donna Nook, the closest seal haul-out lies 9.8 km away from the draft Order Limits.

21.15.3 Coastal otters can hunt as far as 80 m seaward from the coast (Ref 21. 139), therefore, given the distance to the nearest SAC, Wash and North Norfolk Coast SAC, designated for otter (16.2 km), this species will not be impacted by any visual disturbance or displacement from the English Offshore Scheme. In addition, otters spend around three-quarters or more of their lives on land (Ref 21. 140). As there are no recent records of otter around the Anderby Creek Landfall and given the distance to the Wash and North Norfolk Coast SAC they will not be impacted by any visual disturbance or displacement from the English Offshore Scheme.

21.15.4 Pinnipeds and otter are therefore considered to have a low sensitivity to disturbance from the presence of project vessels.

21.15.5 The presence of project vessels would be temporary and transient, restricted to discreet activities and vessels would be moving slowly (circa five knots) whilst within the English Offshore Scheme. Therefore, the magnitude of this impact has been assessed as negligible.

21.15.6 Overall, for all phases, the significance of the effect has been assessed as **negligible** and **not significant**.

21.16 Transboundary Effects

21.16.1 Transboundary effects refer to environmental impacts experienced in other European Economic Area (EAA) countries. These impacts may result from the English Offshore Scheme alone or in-combination with other plans and projects. A screening for transboundary effects has identified to impact pathways which are assessed below.

Changes in supporting habitat prey availability

21.16.2 Activities related to the English Offshore Scheme may result in impacts such as temporary or permanent habitat loss, underwater noise changes, increased suspended sediments which all contribute to prey availability. As a highly mobile species, marine mammals are not limited by jurisdictional boundaries and therefore may travel further distances to locate prey, increasing the potential for transboundary effects to occur. However marine mammals are tolerant to small scale changes in prey availability caused by localised disturbance. Therefore, the magnitude of this impact has been assessed as negligible and the sensitivity of the receptor as low. Therefore, the significance of changes in habitat prey availability leading to transboundary effects is concluded to be of **negligible** and **not significant**.

Underwater noise changes

21.16.3 Underwater noise from the English Offshore Scheme could cause behavioural disturbance or displacement of marine mammals. Underwater noise generated during

construction may travel over large distances, potentially exceeding tens of kilometres, meaning effects could cross into the waters of other EAA states. As the English Offshore Scheme is close to neighbouring countries such as France, the Netherlands and Belgium, some marine mammal species may move between these areas giving rise to possible transboundary effects.

21.16.4 If transboundary impacts do occur as a result of the English Offshore Scheme it is predicted to be temporary and intermittent. Therefore, the magnitude of this impact has been assessed as negligible and the sensitivity has been assessed as low. Therefore, the significance of underwater noise changes leading to transboundary effects is concluded to be **negligible** and **not significant**.

21.17 Further Work to be Undertaken

21.17.1 The information provided in this PEIR is preliminary, the final assessment of significant effects will be reported in the ES. This section describes the further work to be undertaken to support the marine mammal assessment presented in the ES.

Baseline

21.17.2 An extensive programme of marine characterisation surveys has been undertaken for the English Offshore Scheme as outlined in **Volume 1, Part 3, Chapter 19: Intertidal and Subtidal Benthic Ecology**. Survey reports were being issued by the survey contractor as the Preliminary Environmental Assessment was nearing completion. Whilst efforts have been made to include initial survey findings, further work will be undertaken for the ES to ensure all survey results and analyses are incorporated and cross referenced. The data from these surveys will be used to update the baseline and assessment presented in **Volume 1, Part 3, Chapter 19 Intertidal and Subtidal Benthic Ecology, Volume 1, Part 3, Chapter 20 Fish and Shellfish**. These assessments influence the marine mammal assessment for changes in prey availability.

Assessment

21.17.3 The assessments undertaken for this PEIR will be reviewed following stakeholder consultation feedback, further design refinement and review of the final reports from the English Offshore Scheme marine characterisation surveys. The following assessments will then be updated if necessary:

- Changes in prey availability; and
- Cumulative effects assessment.

Further environmental measures

21.17.4 Further consultation with relevant statutory consultees will be undertaken to define the scope and extents of the environmental measures set out in the assessment above. If, following stakeholder consultation feedback, further design refinement and further assessment, it is identified that additional measures are required, these will be detailed as part of the ES.

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